



REPORT

Bajgora Wind Project
Environmental and Social Impact Assessment
Section 1 - Introduction

Submitted to:

SOWI Kosovo LLC

Submitted by:

Golder Associates S.r.l.

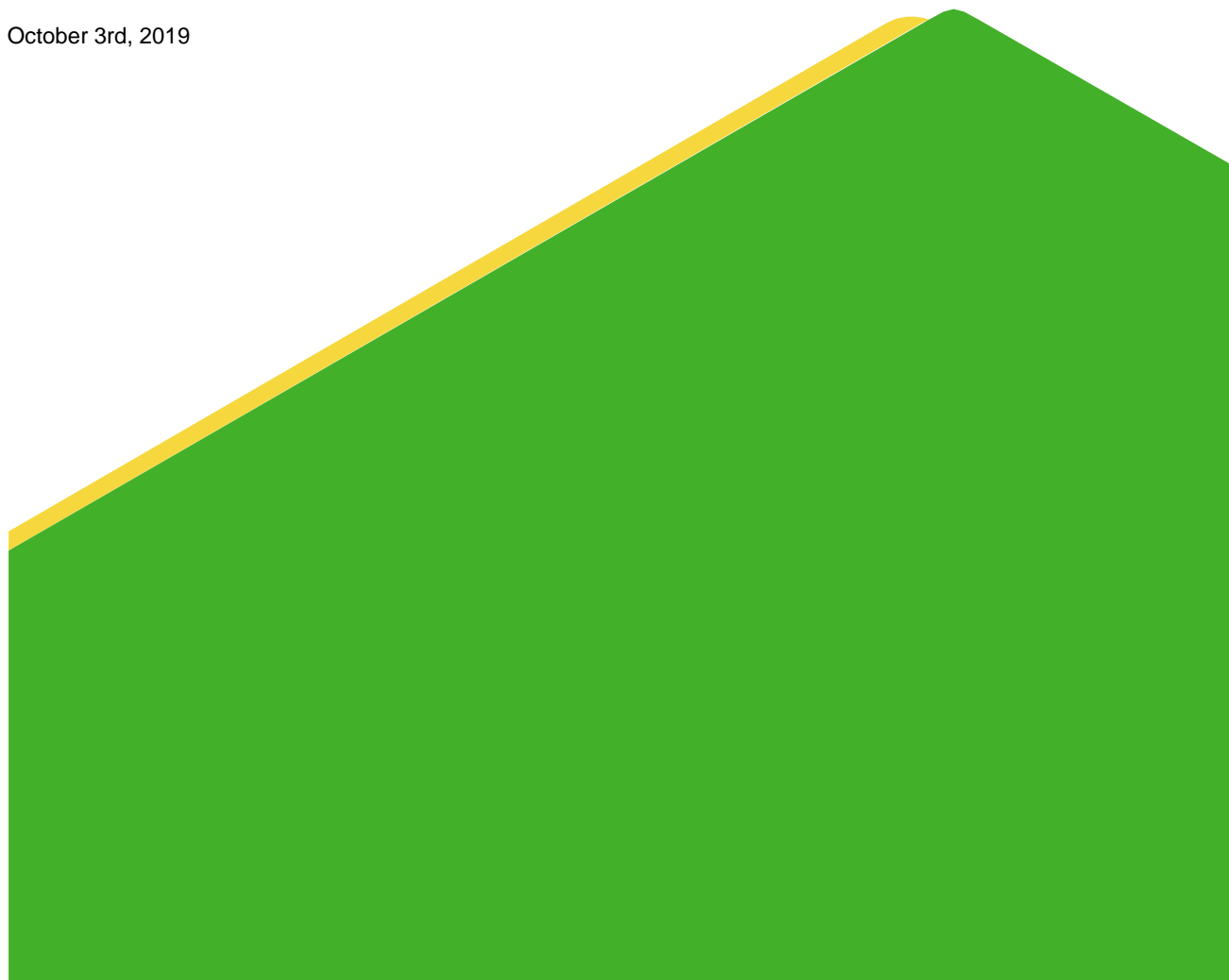
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ESIA Report

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ACRONYMS AND ABBREVIATIONS

| | |
|-----------------|--|
| AoI | Area of Influence |
| AoK | Assembly of Kosovo |
| amsl | Above Mean Sea Level |
| BMP | Biodiversity Management Plan |
| CH | Critical Habitat |
| CIA | Cumulative Impact Assessment |
| CLO | Community Liaison Officer |
| CO ₂ | Carbon Dioxide |
| D | Duration |
| DP | Disclosure Package |
| E&S | Environment & Social |
| EHS | Environmental, Health and Safety |
| EBRD | European Bank for Reconstruction and Development |
| EC | European Community |
| EEC | European Economic Community |
| EIA | Environment Impact Assessment |
| ESAP | Environmental Social Action Plan |
| ESIA | Environment Social Impact Assessment |
| ERO | Energy Regulatory Office |
| ERP | External Resolution Process |
| ESMP | Environmental Social Management Plan |
| EU | European Union |
| EULEX | EU Rule of Law Mission in Kosovo |
| F | Frequency |
| FiT | Feed-in Tariff |
| G | Geographic extent |
| GM | Grievance Mechanism |
| GN | Guidance Note |
| HERMES | Euler Hermes Aktiengesellschaft |
| I | Intensity |
| IA | Impact Assessment |
| IFC | International Finance Cooperation |
| IFS | Impact Factor Score |
| ILO | International Labour Organization |
| IPPC | Integrate Pollution Prevention and Control |

| | |
|-------|---|
| IV | Impact Value |
| KIESA | Kosovo Investment and Enterprise Support Agency |
| KOSTT | Kosovo Electricity Transmission, System and Market Operator |
| LA | Land Acquisition |
| LAPD | Law on Access to Public Documentation |
| LALRF | Land Acquisition and Livelihood Restoration Framework |
| LALRP | Land Acquisition and Livelihood Restoration Plan |
| MEP | Ministry of Economic Development |
| MESP | Ministry of Environment and Spatial Planning |
| NREAP | National Renewable Energy Action Plan |
| NTS | Non-Technical Summary |
| NWCC | National Wind Coordinating Cooperative |
| OECD | Organization for Economic Cooperation and Development |
| OHL | Overhead Transmission Line |
| OHS | Occupational Health and Safety |
| PAP | Project Affected People |
| PBF | Priority Biodiversity Feature |
| PCM | Project Complaint Mechanism |
| PIP | Public Information Policy |
| PR | Performance Requirement |
| PS | Performance Standard |
| R | Reversibility |
| RCIA | Rapid Cumulative Impact Assessment |
| RES | Renewable Energy Source |
| S | Sensitivity |
| SCADA | Supervisory Control and Data Acquisition |
| SE | Stakeholder Engagement |
| SEA | Strategic Environmental Assessment |
| SEO | Sociedad Espanola de Ornitologia |
| SEP | Stakeholder Engagement Plan |
| SNH | Scottish Natural Heritage |
| SSES | Sample Socio-Economic Survey |
| UN | United Nations |
| UNMIK | UN Interim Administration Mission in Kosovo |
| WF | Wind Farm |
| WHO | World Health Organization |

| | |
|-----|------------------------|
| WTG | Wind Turbine Generator |
| WB | World Bank |

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1.0 INTRODUCTION

The Bajgora Wind Project (the Project) consists in the development of three adjacent wind power projects, with a total capacity of 105MW, in a mountainous area near Mitrovica, northern Kosovo. Electricity will be exported through a 19km 110kV transmission line to Vushtrri, to be developed by the Project and then transferred to KOSTT, the state-owned transmission company. The European Bank for Reconstruction and Development (EBRD) is considering providing finance for the Project together with other lenders.

Key Environment and Social (E&S) issues associated with wind power projects include loss of habitat, avian and bat collision risks, land acquisition and impacts to land users, as well as impacts on neighbouring communities including visual impacts, shadow flicker and noise.

The Project has developed national Environmental Impact Assessments (EIA) and baseline reports documenting various biodiversity and social surveys on both the wind farm and the overhead transmission line. This document represents the ESIA Report for the project, developed to meet's EBRD E&S requirements and those of other lenders and draws on the national EIAs and various additional studies and investigations.

1.1 Project Proponent

The project proponent is SOWI Kosovo L.L.C, a joint venture, whose main shareholder is Enlight, that serves as a platform of local and international experts in the field of renewable energy and business development. SOWI Kosovo is a full-service provider whose expertise lies in the design, construction, financing and operating renewable energy facilities. SOWI Kosovo is a partner to SOWI GmbH which is a full-service provider whose expertise lies in the design, construction, financing and operating facilities.

The group provides a quick planning, implementation and operation of projects in the field of environmental renewable energy with focus solar and wind energy. The work is complemented by a tremendous local and international network of people and professionals in the field of the renewable energy, with special emphasis in Kosovo.

In cooperation with the local partners and license holders, SOWI Kosovo aims at providing green energy solutions for the country of Kosovo and also serves as an investor's forum for already licensed renewable energy activities in Kosovo.

The Project is being built by NOTUS energy (www.notus.de) a company founded in Germany in 2001, that has since been initiating, planning, implementing and operating wind power projects. The focus is on the development of its own projects – starting with location acquisition up to turnkey wind turbine farms. Furthermore, NOTUS energy frequently executes services for contractors and as a result, has successfully completed numerous external projects in the past. Thanks to its success, the company is growing steadily. Its headquarters, a second branch in Potsdam and many other offices in Germany and abroad represent NOTUS energy accordingly. Since 2007 NOTUS energy has also been active on an international scale and has carried out various projects in Europe and in North and South America. However, the focus of the company's activities still lies in the regions of Brandenburg, Mecklenburg-West Pomerania and North Rhine-Westphalia.

The financing of the project is being arranged by Enlight Renewable Energy a company publicly traded on TASE (Tel Aviv Stock Exchange). Since its foundation in 2008, Enlight has endeavoured to create value through its energy and infrastructure initiatives. The company specializes in the initiation, development, financing, construction, management, and operation of projects involving the generation of electricity from renewable energy sources. Enlight operates at a large scale both locally and globally, having successfully executed over 150 projects in Israel and in Europe at a capacity exceeding 500 MW encompassing a total construction cost of over US\$1 billion. The company is currently developing a broad project portfolio at different development stages, involving over 1 GW.

Since its establishment, Enlight's global operations have developed at an accelerating pace, serving as one of the company's central growth factors. Enlight's senior executive team brings vast experience and expertise in the initiation and management of widely deployed, complex projects, showing a clear success track in the fields of energy, infrastructures, engineering, and financing.

1.2 Project Rationale

Kosovo has around 1.8 million inhabitants. Its electricity generation is almost entirely dependent on two ageing lignite plants: Kosova A (5 units with 800 MW installed) and Kosova B (two units with 678 MW installed). The current real capacity of these plants is around 915 MW altogether. These plants are causing serious air pollution in Pristina, and Kosova A was supposed to have been closed at the end of 2017, according to a commitment to the EU.

Kosova A and Kosova B are supplied with lignite from the adjacent Sibovc Southwest and Sitnica mines. Kosovo has very large lignite resources, totalling 12.5 billion tonnes, which it claims are the second largest in Europe and fifth largest in the world. It has no oil or gas extraction and no gas import infrastructure, although it is interested in building a gas pipeline to connect to the Trans-Adriatic Pipeline.

A new 500 MW lignite power plant – Kosova e Re – has been under development for many years. Initially it was planned as a 2000 MW plant but failure to find investors has gradually lowered ambitions.

Only around 2 percent of Kosovo's electricity came from hydropower plants in 2015 – the Ujmani power plant and 4 independent power producers – amounting to an installed capacity of 45.84 MW. Since then, some new renewable energy plants have started operating: Brodi II (3.89 MW Hydro Power Plant), Lumbardhi II (9.2+8.4 MW Hydro Power Plant), Albaniku III (4.3 MW Hydro Power Plant), Kitka (32.4 MW Wind Power Plant). Kosovo does not have plentiful water resources like other Balkan countries but in recent years construction of small hydropower plants has increased and become controversial, as several of them are located in protected areas. The only known potential for large hydropower is the 300 MW Zhuri plant and 40 MW Zhuri II, however these suffer from transboundary issues and are not likely to go ahead.

Kosovo has a renewable energy target of 25 percent share in the final gross consumption of energy by 2020 according to the Energy Community Treaty. It also has a domestically set target of 29.47 percent renewables by 2020. In 2015, it had achieved 18.5% renewables, according to the Energy Community.

Most renewable energy so far comes from the use of wood for heating, which accounts for the vast majority of heating, with district heating accounting for only 3-5%.

The Ministry of Economic Development has prepared in 2013 the National Renewable Energy Action Plan (NREAP) for Kosovo, covering the period 2011-2020 as a requirement for Kosovo in its efforts to join the European Union (EU). As such it follows the same approach and methodologies used in EU Member States and other candidate countries in the region.

The plan describes a number of activities, both related to improving the policy framework, taking away barriers hampering the implementation of renewable energy capacity in Kosovo, as well as descriptions of concrete investment projects.

The key actions in the current NREAP are:

- Development of the hydropower sector;
- Study on the preparation for solar energy systems in Kosovo;
- Support scheme for electricity from small scale renewable energy systems (building integrated);
- Mandatory quotas for district heating systems to use Renewable Energy Sources (RES) in its heat supply;

- Formation clusters to increase to use of solar, biomass, geothermal;
- Customs and other tax exemption for biofuels.

The NREAP is currently under revision and a new plan is being prepared for the period 2018-2025, in compliance with the Energy Strategy for the Republic of Kosovo 2017-2026 adopted in January 2018. The new NREAP has defined the following targets for renewable energy:

- **25.64% penetration of RES in the gross final electricity consumption**, which must be achieved by the installation of small hydropower plants (240 MWe), Zhuri hydropower plant (305 MWe), wind plants (150 MWe), biomass plants (14 MWe) and photovoltaic plants (10 MWe);
- **10% penetration of RES in the final consumption in transport**, which must be achieved by the deployment of biofuels;
- **45.65% penetration of RES in the final consumption for heating and cooling**, which must be achieved by the promotion of solar energy (70 MWth), geothermal heat pumps (10 MWth) and biomass in the form of traditional logwood.

The Bajgora Wind Project with its 105 MWe of capacity is covering 2/3 of the target set by the revised NREAP for wind power, and as such is potentially key in the achievement of the objectives of the plan.

1.3 Project Categorisation

The Project has been categorized as A by the EBRD in terms of its 2014 E&S Policy as it could result in potentially significant adverse future environmental and/or social impacts which, at the time of categorisation, cannot readily be identified or assessed, and which, therefore, require a formalised and participatory environmental and social impact assessment (or ESIA) process.

Key impacts from the Project include:

- loss of habitat;
- avian and bat collision risks;
- land acquisition and impacts to land users;
- impacts on neighbouring communities including visual impacts, shadow flicker and noise.

1.4 Background

According to Kosovo Legislation on EIA, there is a need to develop an Environmental Impact Assessment Report for every project that might have significant impact on the environment. Therefore, three separate Environmental Impact Assessment reports for the three components of the Wind Farm have been prepared in line with the regulatory zonal plan of the municipality of Mitrovica and were approved by the Ministry of Environment and Spatial Planning of Kosovo following public discussion held during January 2018, while an EIA for the overhead transmission line is in the approval process as of September 2019.

The Project proponent (SOWI Kosovo) has approached the EBRD and other lenders for financing and in order to meet the criteria set by these institutions has prepared an ESIA according to their requirements. The ESIA has been prepared based on the EIAs and other studies completed to support the approval process by the National authorities in Kosovo and to meet EBRD's and other lenders environmental and social requirements. The ESIA is for lenders purposes but defines the approach and measures to be implemented by the Project to mitigate and manage its associated environmental and social impacts.

This ESIA and associated documents, the “ESIA Disclosure Package (DP)” is being disclosed to project stakeholders and the public in compliance with the EBRD requirements. All stakeholder and public comments will be considered by the Project.

1.5 Scope of the Disclosure Package

The Scope of the Disclosure Package is to ensure that the Environmental and Social documentation relating to the Project is in line with the requirements of the lenders and particularly with the Performance Requirements (PR) of the EBRD.

The ESIA DP consists of the following components:

- ESIA Report;
- Environmental and Social Action Plan;
- Non-Technical Summary (NTS);
- Environmental and Social Management Plans (ESMP), including for early works;
- Stakeholder Engagement Plan (SEP);
- Land Acquisition and Livelihood Restoration Framework (LALRF).

Key annexes to the ESIA will include:

- Preliminary Birds Collision Risk Assessment;
- Noise Propagation Model and Noise Monitoring Assessment;
- Assessment of the Electric and Magnetic Field;
- Shadow Flicker Report;
- Route Survey Report;
- Visual Impact Assessment;
- Wind Study.

1.6 Key Steps in the Disclosure Package Preparation Process

1.6.1 Review of existing documentation

Several documents have been prepared to support the National EIA approval and the ESIA process, and the first stage of the DP preparation process has been a review of the existing documentation, as listed in the following table.

| Nr. | Name of the study | Author |
|-----|---|-------------------------------|
| 01 | Environmental and Social Impact Assessment (ESIA) for Selac 1,2,3 | Environmental Consulting Team |
| 02 | Environmental and Social Action Plan (ESAP) for Selac 1,2,3 | Environmental Consulting Team |
| 03 | Stakeholder Engagement Action Plan (SEAP) | Abkons |
| 04 | Annual Report, Birds-Bats, WF-Selac | Biomaster |
| 05 | Biodiversity Baseline Study Selac | Biomaster |

| Nr. | Name of the study | Author |
|-----|--|--------|
| 06 | Socio-Economic Survey for Project Area-Field Survey Analysis | Abkons |
| 07 | Community Meetings Report | Abkons |
| 08 | Social Impact Assessment for the OHTL (draft) | Abkons |

The review of the existing documentation has allowed the ESIA team to define the gaps in the existing data and information as well as the methodology and structure of the various DP documents.

1.6.2 Baseline data collection

Baseline information has been obtained from the Project specific social and environmental baseline studies that have been carried out as part of this ESIA and the national EIAs, using both desktop and field-based approaches. These studies have been compiled through specifically commissioned surveys, collated from a range of sources including publicly available information and through consultation. Information used to support the assessment process is referenced in the relevant sections.

1.6.3 Stakeholders Engagement

EBRD PR10 “Information Disclosure and Stakeholder Engagement” requires that the Project should demonstrate effective Stakeholder Engagement as an ongoing process in a structured and culturally appropriate manner with Affected Communities and, where relevant, other stakeholders. For Projects with potentially significant adverse impacts on Affected Communities, the Project Proponent will conduct an Informed Consultation and Participation process. The Project Proponent will tailor its consultation process to: the risks and impacts of the Project; the Project's phase of development; the language preferences of the Affected Communities; their decision-making processes; and the needs of disadvantaged and vulnerable groups. This process should be free from external manipulation, interference, coercion and intimidation.

Detailed information on stakeholder engagement activities performed and planned is presented in the Stakeholder Engagement Plan.

1.6.4 Impact Assessment

The general methodology adopted by Golder for Environmental and Social Impact Assessment Studies has been designed to be highly transparent and to allow an analysis of the impacts on the various environmental and social components.

The steps in the Golder Impact Assessment methodology are the following:

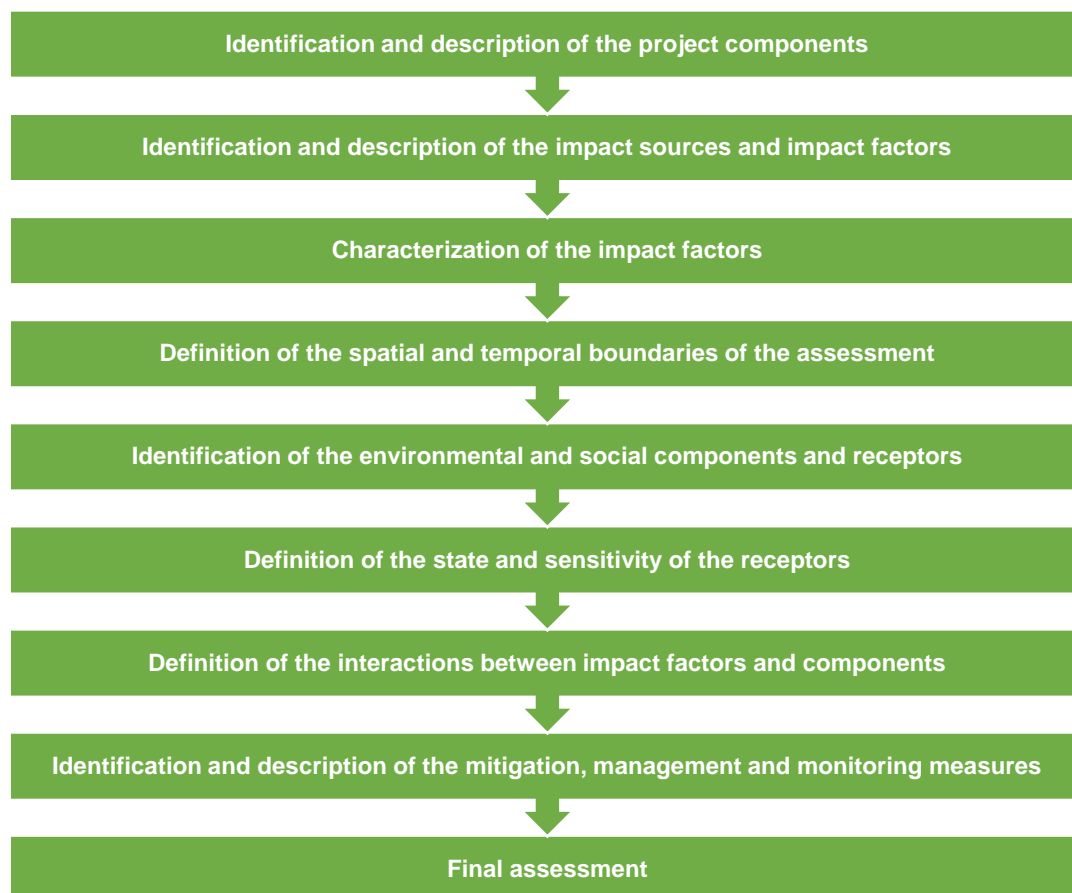


Figure 1: Steps of Golder's Impact Assessment methodology

1.7 Outline of the ESIA Report

This document is organized in the following sections:

- Introduction (Section 1);
- Regulatory and Policy Framework (Section 2);
- Project Description (Section 3);
- Analysis of Alternatives (Section 4),
- Impact Assessment Methodology (Section 5);
- Environmental, Biological and Socio-Economic Baseline (Section 6);
- Impact Assessment (Section 7);
- ESMS Overview (Section 8);
- Conclusions (Section 9).

1.8 ESIA DP Project Team

The DP has been prepared by a multidisciplinary team including Golder experts and external expert, as listed below:

- Roberto Mezzalama, Ecologist and Environmental Engineer – Project Director
- Livia Manzone, Geologist – Project Manager
- Cecilia Amosso, Ecologist
- Guido Trivellini, Ecologist
- Cristian Carlone – Geologist
- Luca Navone – Geologist
- Emanuele Bobbio – Planner and social expert
- Merve Birgul – Sociologist
- Roberto Gaveggio – Environmental Engineer
- Davide Papi – Environmental engineer
- Michele Ferneti – GIS expert
- Cristian Villata – GIS expert
- Lorenzo Morra – Visual impact expert
- Umberto Gallo-Orsi – Ecologist, Ornithologist
- Roberto Toffoli – Ecologist, Bats expert
- Field studies have been conducted by the following local experts under Golder supervision:
- Branko Micevski, Ecologist, Bat expert
- Nicola Micevski – Ecologist, Bat expert
- Taulant Bino – Ecologist, Bird expert
- Klodian Cipo – Sociologist
- Eneida Shuli – Sociologist.



REPORT

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Section 2 - Regulatory Framework

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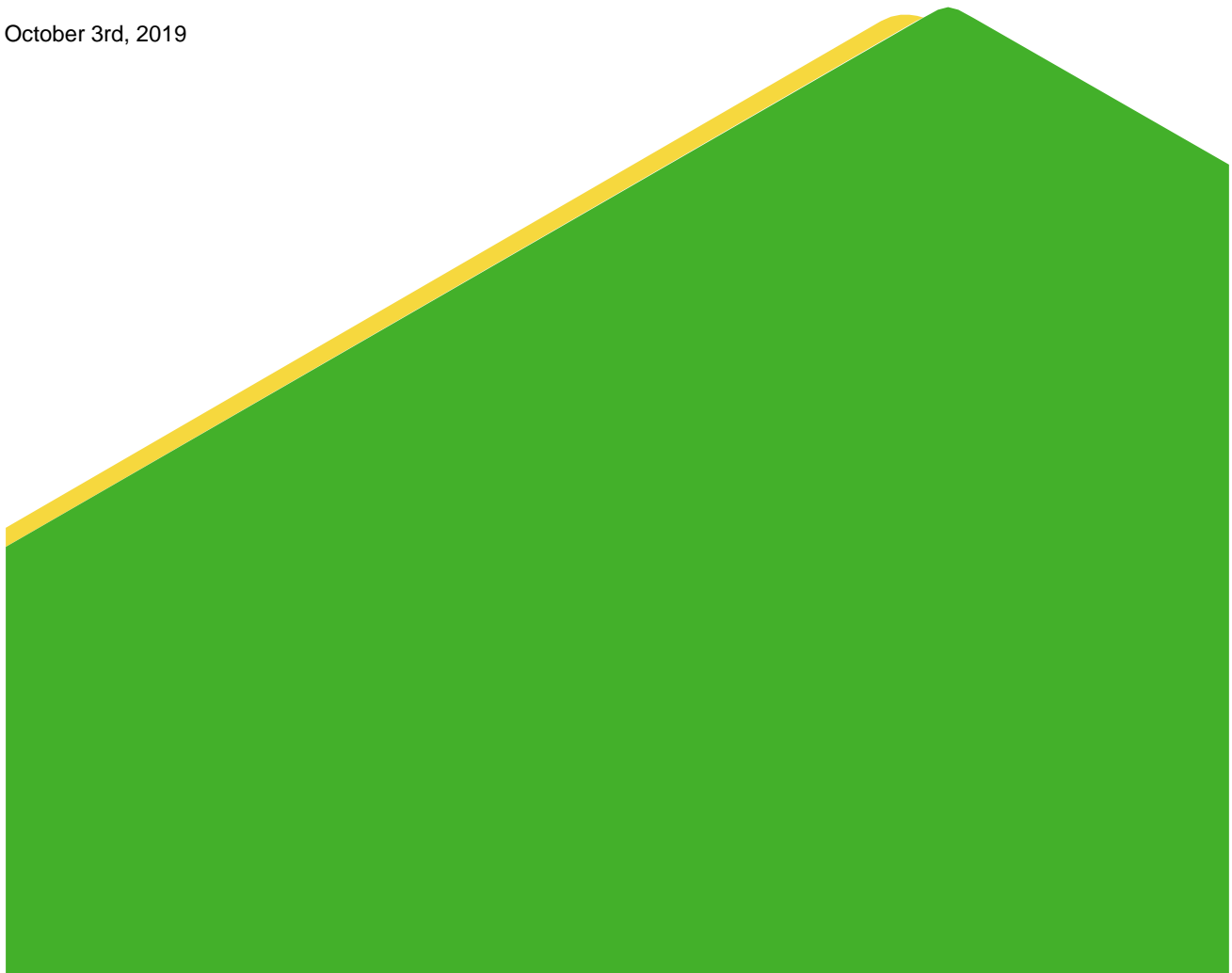


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2.0 REGULATORY AND POLICY FRAMEWORK

2.1 Introduction

This chapter presents an overview of the national and international regulatory framework, including applicable policies, legislation, requirements, guidelines and standards applicable to the Project. In the presence of multiple standards coming from different regulatory sources, the Project will apply the most stringent standards in order to protect the environment and the communities potentially affected by the project.

2.2 Lenders Environmental and Social Standards

The Lenders group involved in the project financing includes:

- Erste Group Bank Ag;
- European Bank for Reconstruction and Development (EBRD);
- NLB Banka;
- Euler Hermes Aktiengesellschaft (HERMES).

Euler Hermes is following the OECD Common Approaches, that require benchmarking projects considered for financing with IFC Performance standards and World Bank Operational Policies, while EBRD has its own Environmental and Social Policy and related Performance Requirements.

2.2.1 European Bank for Reconstruction and Development, Environmental and Social Policy and Performance Requirements

EBRD-financed projects are expected to be designed and operated in compliance with good international practices relating to sustainable development. To help projects achieve this goal, EBRD defined under its 2014 Environmental and Social Policy, ten performance requirements (PR – listed below), covering the key areas of environmental and social issues and impacts.

- PR 1: Assessment and Management of Environmental and Social Impacts and Issues;
- PR 2: Labour and Working Conditions;
- PR 3: Resource Efficiency and Pollution Prevention and Control;
- PR 4: Health and Safety;
- PR 5: Land Acquisition, Involuntary Resettlement and Economic Displacement;
- PR 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources;
- PR 7: Indigenous Peoples;
- PR 8: Cultural Heritage;
- PR 9: Financial Intermediaries;
- PR 10: Information Disclosure and Stakeholder Engagement.

PRs 7 and 9 do not apply to this Project.

2.2.2 Other Lenders and ECAs

Euler Hermes applies the IFC Performance Standards (PS) and EHS Guidelines. These PS include:

- PS 1: Assessment and Management of Environmental and Social Risks and Impacts;
- PS 2: Labour and Working Conditions;
- PS 3: Resource Efficiency and Pollution Prevention;
- PS 4: Community Health, Safety, and Security;
- PS 5: Land Acquisition and Involuntary Resettlement;
- PS 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources;
- PS 7: Indigenous Peoples (not applicable to this project);
- PS 8: Cultural Heritage.

IFC has developed Environmental, Health and Safety (EHS) sector-based guidelines, including guidelines specific for the wind energy sector. The general approach to the management of EHS issues should consider potential impacts as early as possible in the project cycle, including the incorporation of EHS considerations into the site selection, in order to maximize the range of options available to avoid and minimize potential adverse impacts. Importantly, many EHS impacts associated with wind energy facilities may be avoided by careful site selection.

2.2.3 International sustainability guidelines and standards for the wind power sector

Specific guidelines for wind power considered include the following:

- Guidelines on wind energy developments and Natura 2000 – European Union 2011;
- Guidelines for consideration of bats in wind farm projects – Eurobats 2014;
- Guidelines for assessing the impact of wind farms on birds and bats v. 4 – Sociedad Espanola de Ornitologia Birdlife 2014;
- Comprehensive guide to studying wind energy/wildlife interactions – NWCC 2011;
- Recommended bird survey methods to inform impact assessment of onshore wind farms – SNH 2014;
- Visual representation of wind farms, guidance – SNH 2017.

2.3 National Legal and Regulatory Framework

2.3.1 General Framework

The distribution of power in Kosovo reflects the presence of some international organizations which, prior to the full implementation of the Comprehensive Proposal for Kosovo Status Settlement, hold executive powers and share areas of public authority: this is the case of the UN Interim Administration Mission in Kosovo (UNMIK), the EU Rule of Law Mission in Kosovo (EULEX).

Currently, legislation drafted and adopted during three different periods is in force in Kosovo:

- 1) Former Yugoslav laws in force prior to the 1990s war in the Balkans;
- 2) UNMIK laws, adopted by the Special Representative of the Secretary General of the United Nations (SRSG);

3) Laws adopted by the Assembly of Kosovo.

On 10 June 1999 the United Nations Security Council passed its resolution number 1244, establishing the UNMIK. The first UNMIK Regulation, No. 1999/1 “On the Authority of the Interim Administration in Kosovo” established that the laws applicable to the territory of Kosovo prior to 24 March 1999 shall continue to apply in Kosovo insofar as they do not conflict with the international recognized standards, the United Nations Security Council resolution 1244 (1999), or any other regulation issued by UNMIK.

According to this provision the legislation in force includes:

- a) Laws passed by the Assembly of Kosovo (AoK) enacted on 15 June 2008 and thereafter;
- b) Regulations enacted by the UNMIK between 10 June 1999 and 14 June 2008;
- c) Laws dated prior to 22 March 1989, enacted before the abolishment of Kosovo’s autonomy within the Socialist Federal Republic of Yugoslavia; and
- d) Laws dated between 22 March 1989 and 10 June 1999, enacted after the abolishment of Kosovo’s autonomy, provided that they are not discriminatory and are required to fill a legal gap.

Despite the fact that the vast majority of the Laws and Regulations approved before 15 June 2008 have been replaced by new Laws approved by the AoK, the coexistence of all these regulations creates relevant problems of implementation and enforcement.

2.3.2 The 2008 Constitution of Kosovo

On 17 February 2008 Kosovo declared its independence and in April 2008 the Assembly adopted a country’s Constitution that has entered into force in June 2008.

Article 168 establishes that: *“The Constitution is the highest legal act of the Kosovo. Laws and other legal acts shall be in accordance with this Constitution’s International agreements, come after the Constitution in the ranking of norms and they have an important place in Kosovo legal system”*.

Article 199 establishes that International agreements ratified by Kosovo become part of the internal legal system after their publication in the Official Gazette of Kosovo and they are directly applied except for cases when they are not self-applicable and the application requires the promulgation of Ratified international agreements and legally binding norms of international law have priority over the laws of Kosovo.

Article 93 of the Constitution provides that the Government has the competences to make decisions and to issue legal acts or regulations necessary for the implementation of the laws.

According to the above-mentioned constitutional statement the hierarchy of legal norms in Kosovo that are effective in its entire territory are:

- i) The Constitution
- ii) Ratified international agreements;
- iii) Laws;
- iv) Normative acts of the Government.

2.3.3 Policy Framework

To date, Kosovo has pursued approximation to EU environmental standards with important advances in legislation concerning the environmental protection as a whole, the EIA, the SEA, IPPC and Nature

Protection. In addition, the establishment of new environmental laws and further recruitment of staff at both central and local level are positive steps forward. Many laws have been recently revised and adopted by the Assembly of Kosovo and other secondary legislation (administrative instructions, administrative orders and ministerial regulations) have been approved mainly by the Ministry of Environmental and Spatial Planning (MESP).

2.3.4 Institutional Structure of the Energy Sector

Kosovo is part of the Energy Community Treaty and has an obligation to fulfil the requirements of membership by enacting legislation for the development of Renewable Energy Sources, including wind. According to its latest commitment, the overall renewable energy in production in Kosovo should be 25%. Therefore, there is considerable room for development of renewable energy projects including wind energy. According to the Energy Balance of Kosovo of First Quarter of 2018 report, Kosovo produced only 4% of its energy from renewable sources, mainly from hydroelectric sources.

The Ministry of Economic Development (MED) is tasked to develop energy policies and it has the mandate to prepare the Renewable Energy Quotas or tentative targets. MED's Administrative Instruction 05/2017 on Renewable Energy Targets stated that the wind energy targets to be met by 2020 are 150 MW of installed capacity while currently there is none in operation.

The Energy Regulatory Office is the independent Kosovo's body that issues the Preliminary and Final licenses and PPA based on the quality of provided documents during the application process.

2.3.5 The Ministry of Environmental and Spatial Planning

The Ministry of Environment and Spatial Planning is the competent authority designated for the implementation of Horizontal Directives, as well as for applying the EIA procedures.

The MESP, as the competent authority designated for the implementation of the directive, performs the screening of the projects, provides opinions about the types of information which applicants need to provide, and issues the environmental permits.

2.3.6 Environmental and Social Legal Framework

A short summary of Kosovo's primary environmental and social legislative framework is provided below:

Law No. 03/L-214 on environmental impact assessment: the aim of this Law is to prevent or mitigate negative impacts of proposed public and private projects and thereby to contribute to the safeguarding and improvement of the environment, the protection of human health, and the improvement of the quality of life. This Law determines procedures for the identification, assessment, reporting of the environmental impacts of proposed projects and provides for associated administrative procedures to allow during the decision-making process by the Ministry of Environment and Spatial Planning, the issuing of the Environmental Consent and that all the relevant information regarding the environment protection is provided and taken into account.

Projects for which an Environmental Impact Assessment is mandatory are listed in Annex I of this Law. Projects listed in Annex II shall be examined on a case-by-case basis, in accordance with the criteria set out in Annex III, in order to determine whether they must undergo an EIA. Content of the EIA Report is defined in Article 15 of this Law.

Wind energy is listed in Annex II (see below), that is projects must be examined on case-by-case basis, considering the size of the project as shown in the following excerpt from Annex II;

3. Energy Industry

3.1. Industrial installations for the production of electricity, steam and hot water (projects not included in Annex 1);

3.9. Installations for harnessing of wind power for energy production.

Article 20 of this Law requires mandatory public debate on environmental impact assessment projects. On this matter MESP issued **Administrative Instruction No. 09/2011 on information on public participation and interested parties in the environmental impact assessment procedures.**

Law No. 04/L-060 on waste: this Law regulates waste management, plans for environmental management, rights and obligations of licensed persons dealing with waste management, type and conditions of waste collection, transport, treatment, processing, storage and disposal, import, export and waste transit, monitoring, information system and financing.

This Law aim to organize waste management in way to prevent and reduce waste generation, to reuse used components from waste, to provide sustainable development through protection and preservation of resources; to prevent negative effects of the waste on the environment and human health; and that final disposal of waste should be conducted in an acceptable environmental manner. Article 18 prescribes responsibilities and obligations of waste producers. Articles 39, 40, 41, 42, 43, 45, give provisions on waste management from different sources related to different phases a plant's lifetime.

Law No.03/L-233 of nature protection: this Law regulates nature protection, conservation, restoration and sustainable use of natural resources, in condition of natural balance; nature restoration in damaged areas or their parts and compensation for inflicted damages. The law establishes a network of protected areas, planning system, management, inventorying, monitoring, information and funding for the purpose of protection of nature; prevents the over use of endangered species of flora and fauna, especially those of particular importance, rare and endangered, and their habitats as well as ensures the right of the public for information on the nature state and participation in decision making for nature protection thus ensuring the exercise of the right of citizens for healthy environment, relaxation and recreation in nature. It sets the basis for prevention of harmful activities against nature as a consequence of economic activities by legal or physical persons, maintains or restores, at favourable conservation status, natural habitats and species of interest for Kosovo according to EU standards and aims to preserve all species of naturally occurring birds in the wild state (birds, their eggs, nests and habitats).

Law No. 02/L-102 on noise protection: this Law aims to avoid, prevent or reduce on a prioritized basis, the harmful effects, including nuisance, due to noise exposure in the environment. This law provides a basis for developing measures to reduce noise emitted by major sources, such as roads and rail traffic, aircrafts, outdoor and industrial equipment, mobile machinery and other sources of environmental noise pollution and nuisance. Limits of noise levels are regulated by MESP Administrative Instructions.

Law No. 04/L-147 on waters of Kosovo: this Law aims to provide sustainable development and utilization of water resources that are necessary for public health, environmental protection and social-economic development of the Republic of Kosovo. It establishes procedures and guiding principles for the optimal distribution of water resources, based on the use and purpose, ensures protection of water resources from pollution, overuse and misuse and determines the institutional structures for managing the water resources.

Law No 2003/3 on forests of Kosovo: this Law which regulates the forest management and maintains the sustainability of Kosovo's forests. Kosovo aspires to manage its forests in accordance with the statement of principles for a global consensus on the management, conservation, and sustainable

development of all types of forests set forth in Annex III to the Report of the United Nations Conference on Environment and Development (Rio de Janeiro, 3-14 June 1992), including the following principles:

- a) The precautionary principle;
- b) Conservation of biological diversity;
- c) The principle of intergenerational equity; and
- d) Ecologically sustainable development.

Forests in Kosovo are managed by the Kosovo Forestry Agency which is responsible for preparing forest management plans for private and public forests which shall provide for: (a) Establishing new forest growth after harvest through natural regeneration or, where natural regeneration cannot or has not established new growth within a reasonable time, through artificial means; and (b) Improving young trees by restocking open areas, thinning, and other necessary maintenance activities. The Forestry Agency is also responsible for lease agreements of public forests.

The laws on land use in Kosovo that could have direct impact on the Project are:

- Law No. 04/L-110 on construction;
- Law No. 04/L-179 on road transport;
- Law No. 04/L-174 on spatial planning;
- Law No. 02/L-26 on agricultural land;
- Law No.03/L-139 on expropriation of immovable property.

The main laws on health and safety at work in Kosovo are:

- Law No.04/L-161 on Safety and Health at work;
- Regulation No. 06/2017 on Minimum Safety and Health Requirements at Temporary or Mobile construction sites;
- Regulation No. 10/2017 on Safety and Health Protection of Employees from the Risks Related to Chemical Agents at Work.

Other relevant legal and administrative documents include:

- Environmental, Social and Biodiversity:
 - Law on Environmental Protection No. 03/L-025;
 - Law on Strategic Environmental Assessment No. 03/L –230;
 - Law on the Inspectorate of Environment, Waters, Nature, Spatial Planning and Construction No. 04/L-175;
 - Law on Public Health No. 02/L-78;
 - Law on Irrigation of Agricultural Land No. 02/L-9;
 - Law No. 04/L-027, Law for protection against natural and other disasters;
 - Law No. 02/L-116 “On Chemicals” ;
 - Administrative Instruction MESP - No. 07/2017 of Environmental Permit;

- Administrative Instruction MEMP - No. 16/2015 On Information, Public Participation and Interested Parties in the Proceedings of Environmental Impact Assessment;
- Administrative Instruction MESP - No. 10 /2017 On Licencing Compilers of Environmental Impact Assessment Reports;
- Administrative Instruction No. 17/2013 On the Cadastre of Environmental Pollutant Discharge;
- Administrative Instruction No. 08/2012 On Determining of Documentation for Application for Environmental Consent According to Nature of the Project;
- Administrative Instruction No.19/2013 On Assessment of Acceptability of Plan, Program or Intervention of Ecological Network;
- Administrative Instruction GRK No. 18/2013 On Proclamation of the Ecological Network;
- Administrative Instruction No. 12/2011 – For the Sources of Natural Habitat Types, Natural Habitat Map, Threatened and Rare Natural Habitat Types, as well as Safeguard Measures for Conservation of Natural Habitat Types;
- Administrative Instruction No. 14/2013 On the Manner of the Development and Implementation of Risk Assessment Study for the Introduction, Re-Introduction and Cultivation of the Wild Species.
- Employment, Health & Safety
 - Law No.03/L –212 On Labour;
 - Law No. 04/L-161 On Safety and Health at Work;
 - Law No. 2002/9 On Labour Inspectorate;
 - Law No. 04/L-011 On Organizing Trade Unions in Kosovo;
 - Law No. 05/L - 021 Against Discrimination;
 - Law No. 03/L-019 On Vocational Ability, Rehabilitation and Employment of People with Disabilities;
 - Law No. 04/L-004 On Private Security Services;
 - Law No. 2004/15 On Construction;
 - Law No. 06/L-041 On Technical Requirements for Products and Conformity Assessment;
 - Law No. 04/L-197 On Chemicals;
 - Law No. 04/L-078 On General Product Safety;
 - Law No. 05/L-088 On Road Traffic Provision;
 - Law No. 04/L-183 On Land Transport of Dangerous Goods;
 - Law No. 04/L-027 For Protection Against Natural and Other Disasters;
 - Law No. 04/L-230 On the Agency for Emergency Management;
 - Administrative Instruction No. 05/2013 To Prevent and Prohibit Hazardous Child Labour in Kosovo;
 - Administrative Instruction (MLSW) No. 01/2018 For Regulation of Administrative Procedures the Compensation of Maternity Leave Paid by the Government;

- Administrative Instruction (MLSW) No. 09/2017 On Setting a Minimum Wage in the Republic of Kosovo;
- Administrative Instruction 01/2012 For Settling the Easily and Forbidden Work for the Persons Under the Age of 18 Years;
- Administrative Instruction No.13/2011 For Determination of Tasks and Duties with Harmful Impact Precondition for Extension of Annual Leave;
- Regulation MLSW No. 01/2017 on the Protection of Employees from Risks Related to Vibration at the Workplace;
- Regulation MLSW No. 02/2017 on the Protection of Employees from Risks Related to Noise at the Workplace;
- Regulation MLSW No. 04/2017 on The Protection of Employees from Risks Related to Exposure to Carcinogens and Mutagens at Work;
- Regulation MLSW No. 05/2017 On Protection of Workers from Risks Related to Exposure to Biological Agents at Work;
- Regulation MLSW No. 06/2017 On Minimum Safety and Health Requirements at Temporary or Mobile Constructions Sites;
- Regulation MLSW No. 07/2017 On the Protection of Employees from Risks Related to Exposure to Asbestos at Work;
- Regulation MLSW No. 08/2017 On the Protection of Employees from Risks Related to the Electromagnetic Field at The Workplace;
- Regulation MLSW No. 09/2017 On the Protection of Employees from Risks Related to the Optical Radiation at the Workplace;
- Regulation MLSW No. 10/2017 On Safety and Health Protection of Employees from the Risks Related to Chemical Agents at Work;
- Regulation MLSW No. 02/2016 On Minimum Safety and Health Requirements for the Use of Personal Protective Equipment at the Workplace;
- Regulation MLSW No. 04/2016 On Minimum Requirements for the Provision of Safety and Health Signs at Work;
- Regulation MLSW No. 05/2016 On Minimum Requirements Regarding Occupational Safety and Health of Employees at Risk from Explosive Atmospheres;
- Regulation MLSW No. 06/2016 On the Minimum Safety and Health Requirements for Work with Display Screen Equipment;
- Regulation MLSW No. 02/2014 On Determination of Conditions and Criteria for Certification and Licensing Persons and Institutions that Carry Out Health and Safety at Work Duties as Well as Manner, Terms and Program Professional Exam Pass;
- Regulation MLSW No. 03/2014 On Preparation of Risk Assessment Document, its Contents, Data on Which the Risk Assessment Is Based and Record Keeping for Safety and Health at Work;
- Regulation MLSW No. 04/2014 On Minimum Safety Health Requirements for the Workplace;

- Regulation MLSW No. 05/2014 On Minimum Safety and Health Requirements for the Use of Work Equipment by Workers at Workplace.
- Cultural Heritage
 - Law No. 02/L-88 On Cultural Heritage;
 - Regulation (MCYS) No. 06/2017 On Designating Public Cultural Heritage Institutions, Subordinate to The Ministry of Culture, Youth and Sports as Competent Institutions;
 - Regulation No. 05/2008 On Registration, Documentation, Assessment and Reselection of Cultural Heritage for Protection;
 - Regulation No. 04/2008 On Authorizations and Competences of Inspections for Cultural Heritage.
- Land
 - Law No. 03/L-154 On Property and Other Real Rights;
 - Law No. 03/L-139 On Expropriation of Immovable Property, as Amended.
- Asbestos: because Kosovo does not have specific laws regarding asbestos, the following laws and directives were used as reference:
 - Italian laws:
 - Decree of the President No. 120/2017 On the management of excavated rocks and soil (including those containing asbestos);
 - Ministerial Decree of 06/09/1994 On the methods for determining asbestos concentrations.
 - British laws:
 - Control of Asbestos Regulations (CAR-2012).
 - EU Directives:
 - Directive 2009/148/EC of the European Parliament and of the Council of 30 November 2009 on the protection of workers from the risks related to exposure to asbestos at work;
 - Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives;
 - Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC and amending Regulation (EC) No 1907/2006.

2.4 International regulations applicable to the Project

EBRD E&S policy requires beneficiaries to apply relevant EU Directives. The following Directives are in particular applicable to the Project:

- Directive 2001/42/EC on the evaluation of the effects of certain plans and programmes on the environment (commonly referred to as 'SEA' Directive);

- Directive 85/337/EEC on the assessment of the effects of certain public and private projects on the environment, amended in 1997 (97/11/EC) 2003 (2003/35/EC) and 2014 (2014/52/EU) – commonly referred to as the 'EIA' Directive;
- Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds;
- Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora;
- Directive on Environmental Noise, 2002/49/EC;
- Water Framework Directive", 2000/60/EC;
- Dangerous Substances Directive, 2006/11/EC;
- Directive on waste, 2008/98/EC, (repealing certain Directives-75/439/EEC, 91/689/EEC, 2006/12/EC) ;
- Council Directive – OHS, 89/391/EEC;
- Directive 2003/88/EC - Working Time;
- Directive 2009/104/EC – Use of Work Equipment;
- Directive 89/656/EEC - Use of Personal Protective Equipment;
- Directive 2009/161/EU - Indicative Occupational Exposure Limit Values;
- Directive 2003/10/EC – Noise: The Minimum Health and Safety Requirements Regarding the Exposure of Workers to the Risks Arising from Physical Agents (Noise).

2.5 International Agreements

Bern Convention

The Bern Convention, as an international treaty in the field of nature conservation, covering most of the natural heritage of the European continent was considered in this study. This treaty aims to conserve wild flora and fauna species and their habitats, especially those whose conservation requires co-operation between several countries. This was the first international treaty to protect both species and habitats and to bring countries together to decide upon how to act on nature conservation and promote sustainable development. The signatory States should undertake appropriate measures for the protection of habitat for wild flora and fauna (Appendix II) and to devote special attention to protected areas of importance for migratory birds of Appendix II and III and prevent the deliberate damage or destruction of sites for species listed in Appendix II.

Bonn Convention

Species from the list of the Bonn Convention: Appendix I of this Convention also includes species that are in danger of extinction throughout all or major parts of their range. The member states of this convention have to undertake urgent protection of the species from Appendix I through protection or restoration of their habitats; species which are in Appendix II is species that would benefit from International Cooperation in their care and management.

International Labour Organization Conventions

EBRD E&S Policy requires the application of the ILO Conventions, and in particular the eight fundamental Conventions:

- 1. Freedom of Association and Protection of the Right to Organise Convention, 1948 (No. 87);
- 2. Right to Organise and Collective Bargaining Convention, 1949 (No. 98);
- 3. Forced Labour Convention, 1930 (No. 29);
- 4. Abolition of Forced Labour Convention, 1957 (No. 105);
- 5. Minimum Age Convention, 1973 (No. 138);
- 6. Worst Forms of Child Labour Convention, 1999 (No. 182);
- 7. Equal Remuneration Convention, 1951 (No. 100);
- 8. Discrimination (Employment and Occupation) Convention, 1958 (No. 111).

No ILO Convention has been ratified by Kosovar authorities so far, however the ILO has been active in the Country since 1999 and has provided advice on the reform and structuring of the labour market.

2.6 Permits and authorizations

The MESP, as the competent authority designated for the implementation of the directive, performs the screening of the projects, gives opinions about the types of information which applicants need to provide, and issues environmental permits.

Organization of public hearings

According to article 20 of Law No. **03/L-214** on EIA, the investor shall inform the interested stakeholders about the organization of a public debate after the notification for public hearing is received from MESP. The public debate needs to be held within twenty (20) to thirty (30) days after the applicant, the environmental authorities and the public, have been informed.

Amendment to the EIA study

According to article 21 of Law No. **03/L-214** on EIA, within ten (10) days from the conclusion of the public debate, MESP shall review the remarks and opinions which emerged from the public debate. The Ministry may request the applicant to change or complete designated elements of the submitted EIA Report. In case of non-compliance, MESP has the right to suspend the review procedure.

Construction, Location and Energy permit issuance procedure

In line with EU requirements, based on commitments made to the Energy Community secretariat, Kosovo has developed the Feed-in tariff scheme for RES and has adopted a set of legislation to enable priority dispatching to RES in order to reach the targets set by the Energy Community. The MED prepares a National renewable energy action plan and administrative instruction on the indicative targets of the RES.

The Energy Regulatory Office (ERO), together with other stakeholders, is the main institution to develop the feed-in tariffs as well as to accept applications from IPP's (independent power producer). ERO developed a list of documents and permissions to be completed in order to receive preliminary and final authorization. Most of the requirements are same for all RES except for hydroelectric power. As first step the IPP identifies the location; after identification of the location, the necessary feasibility studies are prepared. At the same time the investor is required to apply for environmental consent, grid-connection consent and to provide proof of financial capability to be able to complete the project.

Following submittal of all the documents mentioned above, the ERO board issues the preliminary license. The applicant has then 18 months to provide the remaining documentation (construction permit and grid connection permit).

For construction permit, if the project is lower than 5 MW of installed capacity, investor will go directly to the Municipality and ask for construction conditions to be fulfilled in order to receive the construction permit. In case of projects larger than 5 MW, the construction permit is issued by the MESP.

After completing the construction permit, investor will have to apply for the grid connection permit to the KOSTT. After both permits are obtained, the investor presents them to the ERO board and receives the final license together the PPA (Power Purchase Agreement).

List of relevant institutions involved:

Ministries:

- Ministry of Environment and Spatial Planning - issuing of the Environmental consent, permit and construction permit;
- Energy Regulatory Office - independent body to give license on energy production;
- Ministry of Agriculture, Forestry and Rural development which is in charge for any conversion of land from agricultural into construction land;
- Forestry Agency for leasing land under their possession;
- Municipality which provides consent to the project that is not against any municipal plans.

National institutes and agencies:

- Institute for Nature Protection which is a body within Kosovo Environmental Protection Agency (KEPA);
- Hydro-meteorological institute of Kosovo;
- Seismologic Institute of Kosovo;
- Institute for Protection of Cultural Monuments and Department of Cultural Heritage;
- Authority of Electronic and Postal Communications;
- Civil Aviation Authority of Kosovo.

2.7 Project standards

The Project will be required to comply with the Project Standards summarised in Table 1 through Table 5 below and are reproduced in the relevant technical chapter of this ESIA.

Table 1: Project standards: Air quality

| Pollutant | Time/ Averaging Period | Maximum Allowable Limit | | | |
|--|------------------------------|-------------------------|-----------------------|---|------------------|
| | | EU ¹ | National ² | IFC / WHO ³ | Project Standard |
| SO₂ (µg/m³) | Hourly | 350 | 350 | - | 350 |
| | 24-hour | 125 | 125 | 125 (Interim target-1) 50 (Interim target-2) 20 (guideline) | 125 |
| NO₂ (µg/m³) | Hourly | 200 | 200 | 200 (guideline) | 200 |
| | Yearly | 40 | 40 ⁴ | 40 (guideline) | 40 |
| PM₁₀ (µg/m³) | 24-hour | 50 | 50 | 150 (Interim target-1) 100 (Interim target-2) 75 (Interim target-3) 50 (guideline) | 50 |
| | Yearly | 40 | 40 | 70 (Interim target-1) 50 (Interim target-2) 30 (Interim target-3) 20 (guideline) | 40 |
| Fine particles (PM_{2.5}, µg/m³) | Yearly | 25 | 25 ⁵ | 35 (Interim target-1) 25 (Interim target-2) 15 (Interim target-3) 10 (guideline) | 25 |

¹ Directive 2008/50/EC, 21 May 2008, ambient air quality and cleaner air² Administrative Instruction No.02/2011.³ IFC General Environmental, Health, and Safety (EHS) Guidelines (WHO stands for World Health Organisation)⁴ This is the annual limit for the protection of human health (30 µg/m³ is the annual limit for the protection of vegetation)⁵ 25 µg/m³ is the annual limit for the protection of vegetation. No data for human health protection

| Pollutant | Time/ Averaging Period | Maximum Allowable Limit | | | |
|---|---|-------------------------|-----------------------|---|--|
| | | EU ¹ | National ² | IFC / WHO ³ | Project Standard |
| | 24-hour | - | - | 75 (Interim target-1) 50 (Interim target-2) 37.5 (Interim target-3) 25 (guideline) | 75 |
| Settled Dust (mg/m²/day) | 24-hour | - | - | - | 200⁶ |
| | Yearly | - | - | - | 210 |
| Ozone µg/m³ | Maximum daily 8-hour average in calendar year | 120 | 120 | 160 (Interim target-1) 100 (guideline) | 120 |
| Asbestos – Inside work areas (fibers/litre) | 8-hour | 100 | | | 100 |
| Asbestos – Outside work areas (fibers/litre) | 24-hour | | | 1 | 1 (or the background airborne fiber concentration, if higher) |
| Arsenic (As) (ng/m³)⁷ | 1 year | 6 | - | | 6 |
| Cadmium (Cd) (ng/m³)⁷ | 1 year | 5 | - | | 0.02 |
| Nickel (Ni) (ng/m³)⁷ | 1 year | 20 | - | | 20 |

⁶ Best practice limit for dust deposition, as suggested by Vallack, H. W. & Shillito, D. E. (1998), "Suggested guidelines for deposited ambient dust", Atmospheric Environment, Vol.32, pp.2737-274

⁷ Heavy metals are maximum allowable limits from the total content of the PM10 fraction averaged over one year. Limits are from Directive 2004/107/EC

Table 2: Limits for Atmospheric Emissions from Stationary Sources

| Source | Pollutant | Project Standard (IFC ⁸) (mg/Nm ³) |
|-------------------|-----------------|--|
| Diesel generators | NO _x | 1,460 ⁹ 1,850 ¹⁰ |
| | SO ₂ | ≤ ¹¹ |
| | PM | 50 |
| | CO | - |

Table 3: Soil Standards

| Measured Parameters | Units | Soil contamination limitations according to Administrative Instruction No.11/2018, published by MESP | | |
|---------------------|-------------------|--|---|--|
| | | A - Clean | B - Acceptable contamination, but further investigations are required | C - High contamination and needs to be cleaned |
| Arsenic | mg/kg of dry soil | 30 | 55 | 80 |
| Barium | mg/kg of dry soil | 200 | 625 | 2000 |
| Cadmium | mg/kg of dry soil | 3 | 12 | 25 |
| Chromium | mg/kg of dry soil | 300 | 600 | 800 |
| Cobalt | mg/kg of dry soil | 20 | 240 | 300 |
| Copper | mg/kg of dry soil | 200 | 300 | 500 |
| Lead | mg/kg of dry soil | 200 | 300 | 600 |
| Mercury | mg/kg of dry soil | 1.5 | 5 | 10 |
| Molybdenum | mg/kg of dry soil | 10 | 40 | 200 |
| Nickel | mg/kg of dry soil | 300 | 600 | 800 |
| Selenium | mg/kg of dry soil | 2 | 100 | 200 |
| Tin | mg/kg of dry soil | 20 | 50 | 300 |
| Zinc | mg/kg of dry soil | 300 | 500 | 1000 |

⁸ IFC General Environmental, Health, and Safety (EHS) Guidelines⁹ IFC Standard: exhaust bore size diameter [mm] < 400¹⁰ IFC Standard: exhaust bore size diameter [mm] > or = 400¹¹ 1.5 percent Sulphur or up to 3.0 percent Sulphur

For asbestos in soils, a conservative concentration of 1000 mg/kg (i.e. 0,1% in mass) is settled to be used as a preliminary decision-making threshold to determine how to approach excavation and handling of the material in a specific construction site. The value of 1000 mg/kg is the threshold defined by the Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives (EU) to determine whether a waste containing asbestos is hazardous or not.

Table 4: Wastewater standards

| | | Limit values of concentration of hazardous substances allowed to be discharged in the public sewage and water bodies (based on river categories) ¹² | | | | | Effluent Wastewater Standards for Domestic Wastewater (EU Guidance ¹³) | Effluent Wastewater Standards for Domestic Wastewater (IFC Standards ¹⁴) |
|-----|--------------------------------|--|---------|--------|-------|----------------------------|--|--|
| Nr. | Parameter | Cat.II | Cat.III | Cat.IV | Cat.V | Discharge on public sewage | | |
| 1 | Temperature °C | 25 | 30 | 35 | 35 | 45 | - | - |
| | At °C not more than: | 2 | 3 | 3 | 3 | - | | |
| 2 | pH | 6,5-8 | 6-8,5 | 6-8,5 | 6-8,5 | 5,5-9 | - | - |
| 3 | Colour | - | Weak | Weak | Weak | - | - | - |
| 4 | Aroma | - | Weak | Weak | weak | - | - | - |
| 5 | Suspended solids mg/L | 35 | 35-60 | 60-150 | 150 | 300 | 35 | 50 |
| 6 | Precipitation substances ml/1h | 0,5 | 0,5 | 1 | 1 | 10 | - | - |
| 7 | BOD5 mg/L | 25 | 25 | 40 | 80 | 250 | 25 | 30 |
| 8 | COD mg/L | 125 | 125 | 200 | 400 | 700 | 125 | 125 |
| 9 | Organic Carbon total mg/L | 15 | 30 | 30 | 40 | - | - | - |
| 10 | Aluminium mg/L | 2 | 3 | 3,5 | 4 | 4 | - | - |

¹² According to Kosovan Administrative Instruction No. 13/2008

¹³ EU standards from Directive 91/271/EEC concerning urban wastewater treatment

¹⁴ IFC General Environmental, Health, and Safety (EHS) Guidelines

| | | Limit values of concentration of hazardous substances allowed to be discharged in the public sewage and water bodies (based on river categories) ¹² | | | | | Effluent Wastewater Standards for Domestic Wastewater (EU Guidance ¹³) | Effluent Wastewater Standards for Domestic Wastewater (IFC Standards ¹⁴) |
|-----|---------------------|--|---------|--------|-------|----------------------------|--|--|
| Nr. | Parameter | Cat.II | Cat.III | Cat.IV | Cat.V | Discharge on public sewage | | |
| 11 | Arsenic mg/L | 0,05 | 0,1 | 0,2 | 0,2 | 0,5 | - | - |
| 12 | Barium mg/L | 2,5 | 3 | 4 | 5 | 5 | - | - |
| 13 | Lead mg/L | 0,2 | 0,5 | 0,75 | 1 | 2 | - | - |
| 14 | Bohr mg/L | 1,5 | 2 | 2,5 | 3 | 4 | - | - |
| 15 | Cadmium mg/L | 0,01 | 0,05 | 0,1 | 0,2 | 0,5 | - | - |
| 16 | Cobalt mg/L | 0,5 | 1 | 1,25 | 1,5 | 2 | - | - |
| 17 | Total Chromium mg/L | 0,5 | 1 | 1,25 | 1,5 | 2 | - | - |
| 18 | Chromium6+ mg/L | 0,05 | 0,1 | 0,15 | 0,15 | 0,2 | - | - |
| 19 | Iron mg/L | 2 | 3 | 4 | 5 | 10 | - | - |
| 20 | Copper mg/L | 0,1 | 0,25 | 0,4 | 0,5 | 0,7 | - | - |
| 21 | Nickel mg/L | 0,5 | 1 | 1 | 1,5 | 2 | - | - |
| 22 | Vanadium mg/L | 0,05 | 0,05 | 0,075 | 0,075 | 0,1 | - | - |
| 23 | Mercury mg/L | 0,005 | 0,01 | 0,01 | 0,1 | 0,5 | - | - |
| 24 | Silver mg/L | 0,1 | 0,15 | 0,2 | 0,3 | 0,5 | - | - |
| 25 | Manganese mg/L | 1,5 | 2 | 2,5 | 2,5 | 4 | - | - |
| 26 | Zinc mg/L | 0,5 | 1 | 1,5 | 2 | 2 | - | - |
| 27 | Alloy mg/L | 0,75 | 1 | 1,25 | 1,5 | 2 | - | - |
| 28 | Selenium mg/L | 0,02 | 0,03 | 0,04 | 0,05 | 0,1 | - | - |
| 29 | Chlorine mg/L | 0,2 | 0,25 | 0,3 | 0,3 | 0,3 | - | - |

| | | Limit values of concentration of hazardous substances allowed to be discharged in the public sewage and water bodies (based on river categories) ¹² | | | | | Effluent Wastewater Standards for Domestic Wastewater (EU Guidance ¹³) | Effluent Wastewater Standards for Domestic Wastewater (IFC Standards ¹⁴) |
|-----|---------------------------------|--|---------|--------|-------|----------------------------|--|--|
| Nr. | Parameter | Cat.II | Cat.III | Cat.IV | Cat.V | Discharge on public sewage | | |
| 30 | Ammonia as NH ₄ mg/L | 0,2 | 0,5 | 0,8 | 1 | 10 | - | - |
| 31 | Nitrites mg/L | 0,2 | 0,5 | 1 | 1,5 | 10 | - | - |
| 32 | Nitrates mg/L | 30 | 35 | 40 | 40 | 50 | - | - |
| 33 | Total nitrogen mg/L | - | - | - | - | 15 | 15 | 10 |
| 34 | Total Sodium mg/L | 10 | 15 | 15 | 20 | - | - | - |
| 35 | Cyanides mg/L | 0,001 | 0,005 | 0,01 | 0,02 | 0,2 | - | - |
| 36 | Fluorides mg/L | 1,5 | 2 | 2,5 | 2,5 | 5 | - | - |
| 37 | Orthophosphates mg/L | 1 | 2 | 3 | 4 | - | - | - |
| 38 | Total Phosphorus mg/L | 1 | 1 | 1,5 | 2 | 10 | 2 | 2 |
| 39 | Sulphates mg/L | 150 | 200 | 250 | 250 | 400 | - | - |
| 40 | Sulphites mg/L | 1 | 2 | 4 | 5 | 10 | - | - |
| 41 | Oils and grease mg/L | 4 | 5 | 7 | 10 | 50 | - | 10 |
| 42 | Mineral oils mg/L | 0,5 | 1 | 2 | 4 | 10 | - | - |
| 43 | Aldehydes mg/L | 1 | 1,5 | 2 | 2 | 2 | - | - |
| 44 | Chlorinated Hydrocarbons mg/L | 1,5 | 2 | 2,5 | 3,5 | 5 | - | - |

| | | Limit values of concentration of hazardous substances allowed to be discharged in the public sewage and water bodies (based on river categories) ¹² | | | | | Effluent Wastewater Standards for Domestic Wastewater (EU Guidance ¹³) | Effluent Wastewater Standards for Domestic Wastewater (IFC Standards ¹⁴) |
|-----|-------------------------------------|--|---------|--------|-------|----------------------------|--|--|
| Nr. | Parameter | Cat.II | Cat.III | Cat.IV | Cat.V | Discharge on public sewage | | |
| 45 | Phenols mg/L | 0,01 | 0,01 | 0,015 | 0,015 | 0,3 | - | - |
| 46 | Anionic detergents mg/l | 1 | 2 | 4 | 4 | 10 | - | - |
| 47 | Non-ionized detergents mg/l | 1 | 2 | 4 | 4 | 10 | - | - |
| 48 | Cationic detergents | 0,5 | 1 | 1 | 2 | 5 | - | - |
| 49 | Aromatic hydrocarbons mg/l | 0,01 | 0,02 | 0,03 | 0,05 | 0,2 | - | - |
| 50 | Organic chlorinated pesticides mg/l | 0,0025 | 0,003 | 0,005 | 0,007 | 0,05 | - | - |
| 51 | Organophosphorus pesticides mg/l | 0,002 | 0,0025 | 0,003 | 0,005 | 0,01 | - | - |
| 52 | Organic compounds mg/l | 0,01 | 0,01 | 0,02 | 0,03 | 0,05 | - | - |
| 53 | Total alcohol mg/l | 0,5 | 1 | 1,5 | 1,5 | 10 | - | - |
| 54 | General radioactivity Bq/l | 0,25 | 0,27 | 0,27 | 0,3 | 0,37 | - | - |
| 55 | Total active surface materials mg/l | 4 | 5 | 7 | 10 | 20 | - | - |

| | | Limit values of concentration of hazardous substances allowed to be discharged in the public sewage and water bodies (based on river categories) ¹² | | | | | Effluent Wastewater Standards for Domestic Wastewater (EU Guidance ¹³) | Effluent Wastewater Standards for Domestic Wastewater (IFC Standards ¹⁴) |
|-----|-----------------------------------|--|---------|--------|-------|----------------------------|--|--|
| Nr. | Parameter | Cat.II | Cat.III | Cat.IV | Cat.V | Discharge on public sewage | | |
| 56 | Total coliforms TC in 100 ml | 4500 | 5000 | 5500 | 6000 | - | 400 ¹⁵ MPN ¹⁶ /100 ml | - |
| 57 | Faecal coliforms FC in 100 ml | 900 | 1000 | 1200 | 1500 | - | - | - |
| 58 | Faecal streptococcus FS in 100 ml | 90 | 100 | 120 | 150 | - | - | - |
| 59 | Pathogenic microorganisms present | - | - | - | - | - | - | - |

According to the Project design, wastewater will be removed off site for disposal in the municipal Wastewater Treatment Plant (WWTP) in Mitrovica and thus the limits about “discharge on public sewage” applies as Project Standards.

¹⁵ Not applicable to centralized, municipal, wastewater treatment systems which are included in EHS Guidelines for Water and Sanitation.

¹⁶ MPN = Most Probable Number

Table 5: Noise Level Guidelines (IFC Environmental Health and Safety Guidelines¹⁷)

| | One Hour L_{Aeq} (dBA) | |
|---|--------------------------|--------------------------|
| | Daytime 07:00 – 22:00 | Night-time 22.00 – 07.00 |
| Residential; institutional; educational ¹⁸ | 55 | 45 |
| Industrial; commercial | 70 | 70 |

Local legislation disciplines road/rail traffic and equipment for use on open-air (Administrative Instruction No. 08/2009 on Allowed Values of Noise Emissions from Pollution Sources).

Since the Project site is a greenfield, acceptable levels for noise at receptors are those suggested by the IFC General HSE Guidelines for Residential, institutional and educational. The IFC states that noise impacts should not exceed the levels presented in Table 5 or result in a maximum increase above background levels of 3 dBA at the nearest receptor location off-site (IFC, 2007).

¹⁷ Guidelines values are for noise levels measured out of doors. Source: Guidelines for Community Noise, World Health Organization (WHO), 1999.

¹⁸ For acceptable indoor noise levels for residential, institutional, and educational settings refer to WHO (1999).



REPORT

Bajgora Wind Project
Environmental and Social Impact Assessment
Section 3 - Project Description

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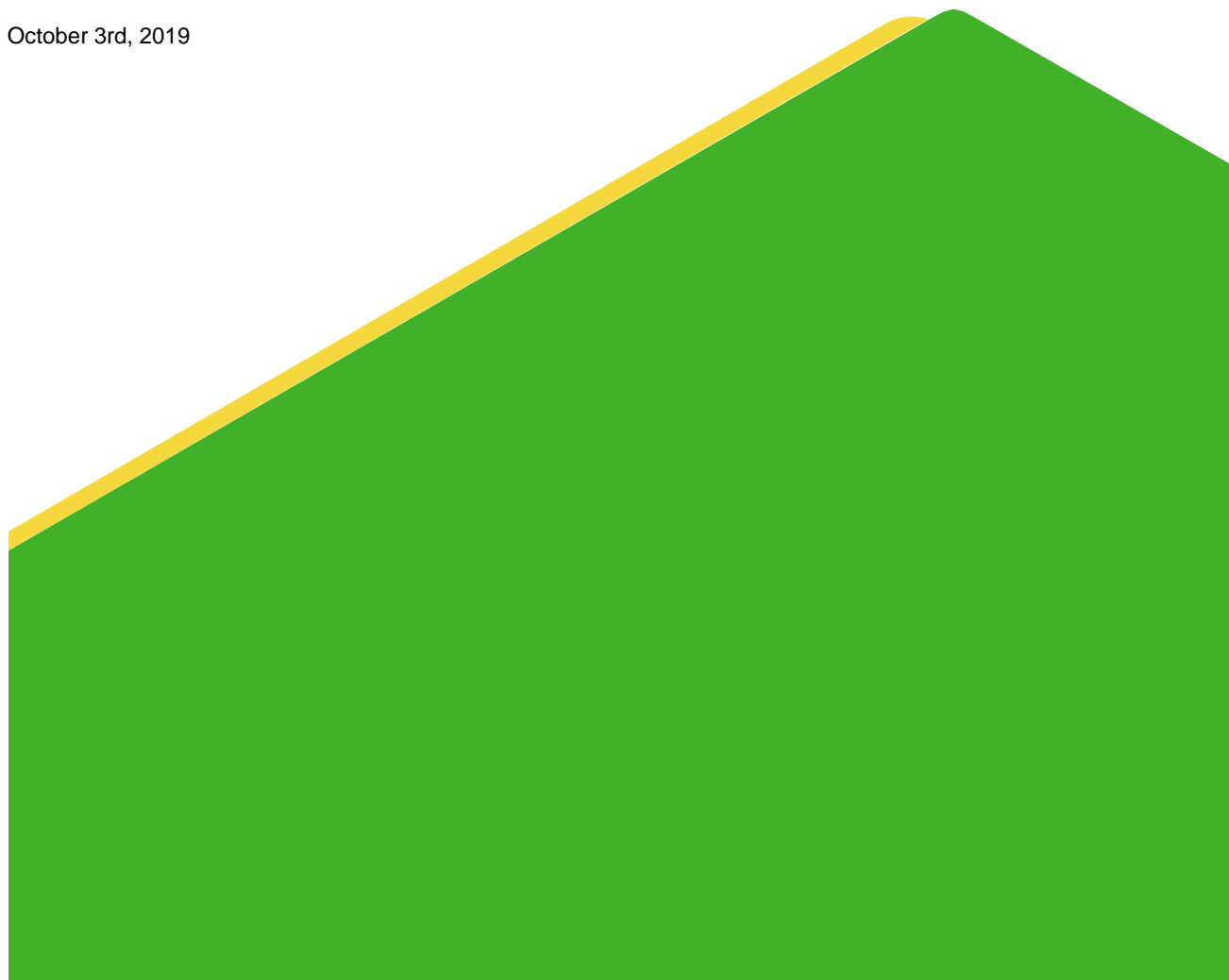


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3.0 PROJECT DESCRIPTION

SOWI Kosovo will build a Wind Farm with 27 wind turbines and a maximum total capacity of 105 MW. The project is located in the area of Shalë–Bajgorë approximately 50 km north of Pristina, in Northern Kosovo. In addition, an Overhead Transmission Line is proposed to be implemented to connect the Wind Farm with the National Kosovo grid. The Wind Farm and the associated OHL are referred to hereinafter as “Bajgora Wind Project” or “the Project”.

This Section provides a detailed description of the Project; including main units, supporting infrastructure and associated facilities to be constructed and operated within the Project Area.

3.1 Project Rationale

The purpose of the Project is the climate-friendly, sustainable and low-risk generation of electrical energy using wind energy. The Project will contribute to climate change mitigation by increasing the share of renewable energy generation in Kosovo and add 105 MW of wind generation capacity to the national energy system.

The electricity system of the Republic of Kosovo is built within the power system of the former Yugoslavia, and today the transmission system of the Republic of Kosovo is connected to all neighbouring transmission systems like TSO in the Republic of Albania, EPS in the Republic of Serbia, EPCG in the Republic of Montenegro and ESM in the Republic of Macedonia. The transmission system of the Republic of Kosovo raises the reliability of the supply and enables the exchange and transit of electricity between the UCTE ("Transmission Coordination Union") power systems of the second synchronous zone.

Key Project characteristics are summarized in the following table.

Table 1: Key Project characteristics

| Information | Explanation/Description |
|-------------------------------------|---|
| Number of turbines | 27 |
| Turbine type | GE 3.8-137 |
| Turbine capacity | 3.83 MW |
| Total installed capacity of the WPP | 103.41 MW |
| Annual net electricity generation | Approx. 320 GWh/year |
| OHL name | LP 110 kV NS Vushtrria 1- NS PEE Selac |
| OHL type | 110kV single-circuit transmission line |
| OHL length | Approx. 19.5 km |
| OHL pylons | 92 |
| OHL connection | 110kV Substation Vushtrri (point of connection to the public grid operator “KOSTT”) |

3.2 Project Area

The location where the wind farm will be installed is known as Bajgora; the nearest settlements to the planned wind farm are the villages of Bajgore to the South, Zhiti to the North-East, Kacandoll to the East and Zaberrxhe to the west.

The location of the wind farm is on remote and uninhabited area, at an altitude between 1500 m and 1800 m above mean sea level (amsl). The land cover on the wind farm area is dominated by highland forests and mountain pastures stretching over rocky terrains.

The OHL originates at the wind farm substation situated in Bajgorë and is connected to the National distribution grid through the Substation of Vushtrri. The OHL is 19,5 km long and is located at an altitude between 528 and 1600 m amsl. It crosses the villages of Bajgorë, Gumnishtë, Rashan, Tërstenë, Pasomë, Sllatinë, Banjskë, Dobrollukë and Vushtrri. The route chosen for the OHL is mostly in mountainous and hilly areas, passing through forest and pasture areas and through agricultural areas in the terminal part.

The map below shows the location of the Project in Kosovo (Figure 1).

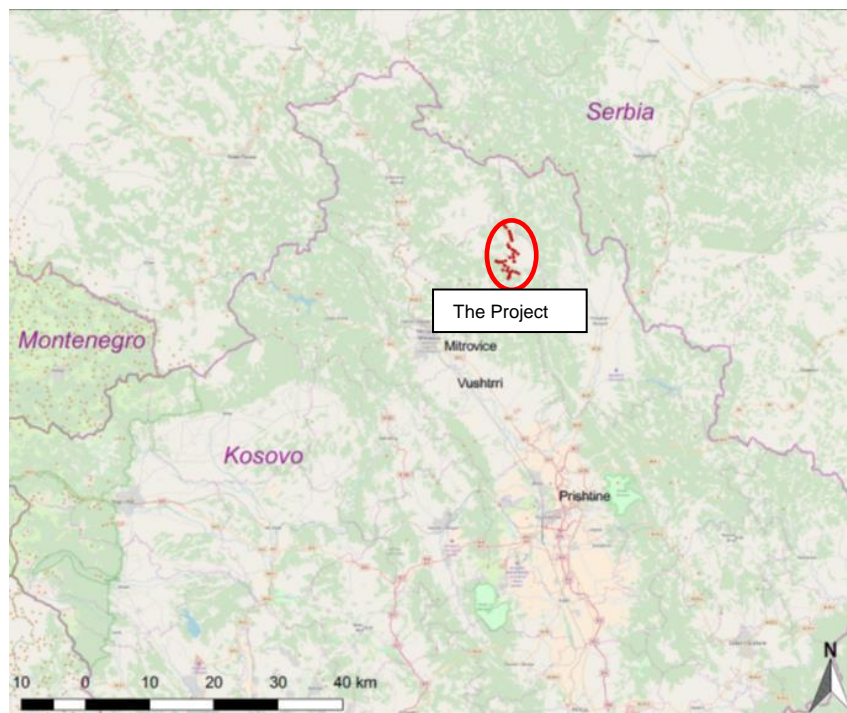


Figure 1: Project location in Kosovo

The Project stretches through an area of approximately 80 km², which includes:

- The wind farm infrastructures, including the turbine foundations and platforms, the substation, the permanent crane pads and the access roads;
- The OHL right of way, including the pylons of the power line and the access roads; and
- The safety area including a buffer of 1 km around the wind turbines where no houses should be built.

The wind turbines will be connected via 33 kV underground cables (including data lines - wind farm-internal cabling), that will be laid in a trench and covered with soil. The grid connection to the 110 kV distribution networks is carried out via a 110 kV overhead line to the Vushtrri substation. Additional and more detailed Project maps are provided in Annex to the present ESIA (Map 01.01 and Map 02.01).

3.3 Project Components

The permanent components included in Project are the following:

- the wind turbines (tower, foundations, platforms/crane pads);
- the access roads;
- the transformer substation;
- the overhead transmission line;
- the underground electric cables; and
- the deposit (soil and rock) areas.

Information on the components of the Bajgora Wind Project, including the wind turbines, OHL and associated facilities are provided in the following sections.

In addition, the following temporary project components will be built during construction:

- storage areas;
- camp;
- quarries.

The exact location of the temporary project components is not known at the moment and will be identified at a later stage. The OHL is a Project component during construction and after transfer to KOSST it will become an associated facility.

3.3.1 Wind turbines

The wind farm consists of 27 wind turbines located in three areas named Selac 1 (WTGI 1-9), Selac 2 (WTGII 10-18) and Selac 3 (WTGIII 19-27). The layout of the wind turbines is show in Figure 2.

The wind turbine model was chosen based on the technical and commercial offer available on the market. Offers were provided from various companies, including Vestas, GE, Senvion and Enercon. As a result, the GE 3.8-137 wind turbines were chosen.

The technical characteristic of the wind turbines are as follows:

- total height: 178.5 m;
- hub height: 110 m;
- rotor diameter: 137 m;
- capacity: 3.83 MW.

The distance between each turbine varies from 375 m to 980 m. Considering the complex terrain at the wind farm site, the wind sector management and turbulence report done by GE confirmed the turbine layout. The foundation of the towers will occupy a surface of 359,7 m² and will be placed to a depth of 3,2 m ; the channels where the cables will be placed are planned to be 0, 80 m deep.

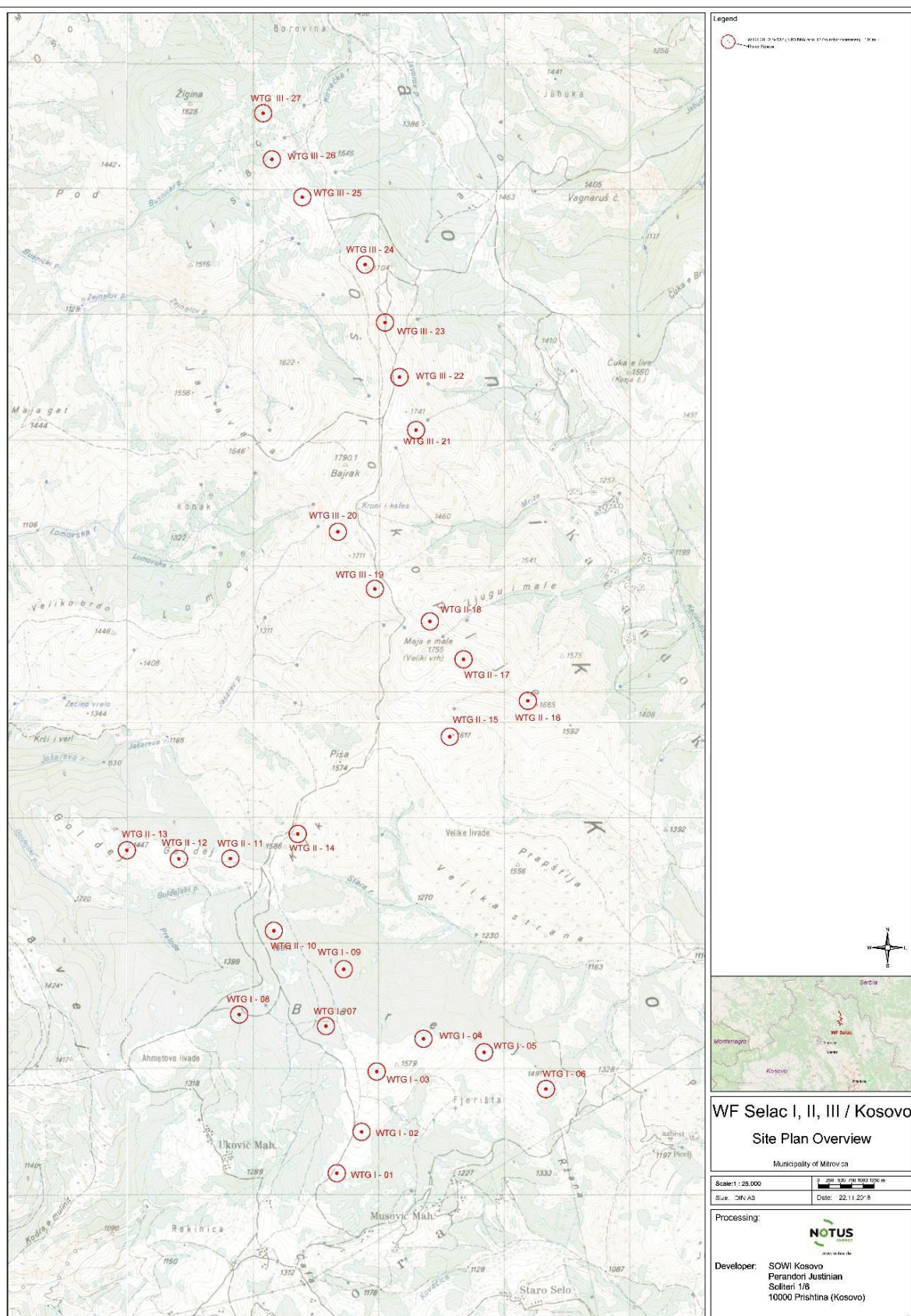


Figure 2: Wind turbines layout

Construction of foundations and assembling the wind turbines will take about 70 weeks/18 months and connecting them to the grid will take about 2 weeks.

Technical specifications of the turbines are summarized in the table below.

Table 2: Technical specifications of GE 3.8-137

| Technical specification of GE 3.8-137 | |
|---------------------------------------|----------------------------|
| General specification | |
| Wind class | IEC IIb (110 m hub height) |
| Rated power | 3.83 MW |
| Total height | 178.5 m |
| Cut-in wind speed | 3 m/s |
| Cut-out wind speed | 25 m/s |
| Re cut-in wind speed | 22 m/s |
| Rotor | |
| Rotor diameter | 137 m |
| Swept area | 14741 m ² |
| Rotational direction | clockwise (front view) |
| Speed, Dynamic Operation Range | 6.3 – 13.6 |
| Orientation | upwind |
| Blades | |
| No. of Blades | 3 |
| Type Description | air foil shell |
| Blade Length | 67.2 m |
| Maximum Chord | 4 m |
| Tower | |
| Hub height | 110 m |
| Type | tubular steel tower |
| Foundation | |
| Shape | circular |
| Diameter | 19.8 m |

The wind turbine GE 3.8-137 is shown in the following figure.



Figure 3: GE 3.8-137 wind turbine

Obstruction and tower lights will be installed on nacelle and tower on turbines as indicated in table below.

Table 3: Indication of turbines with installed Aviation Obstruction Lights

| WTG | Terrain altitude + hub height [m] | Installation of aviation obstruction lights on nacelle | Installation of aviation obstruction lights on middle of the tower |
|-----|-----------------------------------|--|--|
| 01 | 1579 | Yes | Yes |
| 02 | 1620 | No | No |
| 03 | 1673 | Yes | Yes |
| 04 | 1684 | No | No |
| 05 | 1592 | Yes | Yes |
| 06 | 1577 | Yes | Yes |
| 07 | 1707 | No | No |
| 08 | 1670 | Yes | Yes |
| 09 | 1700 | Yes | Yes |
| 10 | 1724 | Yes | Yes |
| 11 | 1660 | Yes | Yes |
| 12 | 1595 | No | No |
| 13 | 1552 | Yes | Yes |
| 14 | 1678 | Yes | Yes |
| 15 | 1726 | Yes | Yes |
| 16 | 1760 | Yes | Yes |
| 17 | 1828 | Yes | Yes |

| WTG | Terrain altitude + hub height [m] | Installation of aviation obstruction lights on nacelle | Installation of aviation obstruction lights on middle of the tower |
|-----|-----------------------------------|--|--|
| 18 | 1788 | No | No |
| 19 | 1786 | Yes | Yes |
| 20 | 1800 | Yes | Yes |
| 21 | 1822 | Yes | Yes |
| 22 | 1832 | No | No |
| 23 | 1824 | Yes | Yes |
| 24 | 1810 | Yes | Yes |
| 25 | 1682 | Yes | Yes |
| 26 | 1677 | No | No |
| 27 | 1667 | Yes | Yes |

The technical specifications of the aviation obstruction lights are presented below:

- Nacelle:
 - Applied standard: ICAO
 - Light mode: Night and Day (dual type)
 - Number of lights per turbine: Single (1) – only one light without backup
 - Battery backup time: 1 hr
 - Day light colour: white (type A)
 - Day light intensity: 20.000 cd
 - Photocell: day/night switch
 - Night light colour: red (type B)
 - Night light intensity: 2.000 cd
 - Night and day light type: flashing, frequency rate between 20 and 60 per minute.
 - Night and day synchronization: GPS.
- Tower lights (installed on middle of the tower)
 - Applied standard: ICAO
 - Light mode: Night
 - Number of lights per turbine: 3 lights arranged 120° around the tower
 - Night light intensity: 32 cd (type E)
 - Battery backup time: 1 hr
 - Night light colour: red
 - Night light type: flashing in accordance to regulation

3.3.2 Transformer Substation

To ensure the transformation of the electricity produced by the wind turbines, an internal transformer substation 110/33 kV will be built (Figure 4).

The planned substation will be located in the southern part of the project site, between wind turbines no. 02 and 03. The total area of the substation is 1260 m² and includes the following elements:

- 110 kV outdoor switch yard;
- 33/110kV power transformer (outdoor);
- administrative building with 33 kV switch gear, control room, office and management facility, auxiliary supply; and
- fences, roads and parking.

All major elements will be mounted on a concrete foundation designed for the ground conditions at the site. The transformer substation complex will be fenced and equipped with an outdoor lighting system.

The installation and the connection to the electricity network will take about 14 months.

The substation will be equipped with two 50/63 MVA power transformers that will step up the power generated by the turbines from 33 kV to 110kV.

The connection between each wind turbine and the substation will be through a network of underground cables (33 kV). The cable route will mainly be next to the access roads to the wind turbines. The cables will be placed in trenches excavated at the side of the roads at a depth of 80 cm; the cables will be covered with soil.

The approximate length of the cables in each component of the wind farm will be:

- Selac I – 5,500 m;
- Selac II – 10,100 m;
- Selac III – 20,500 m.

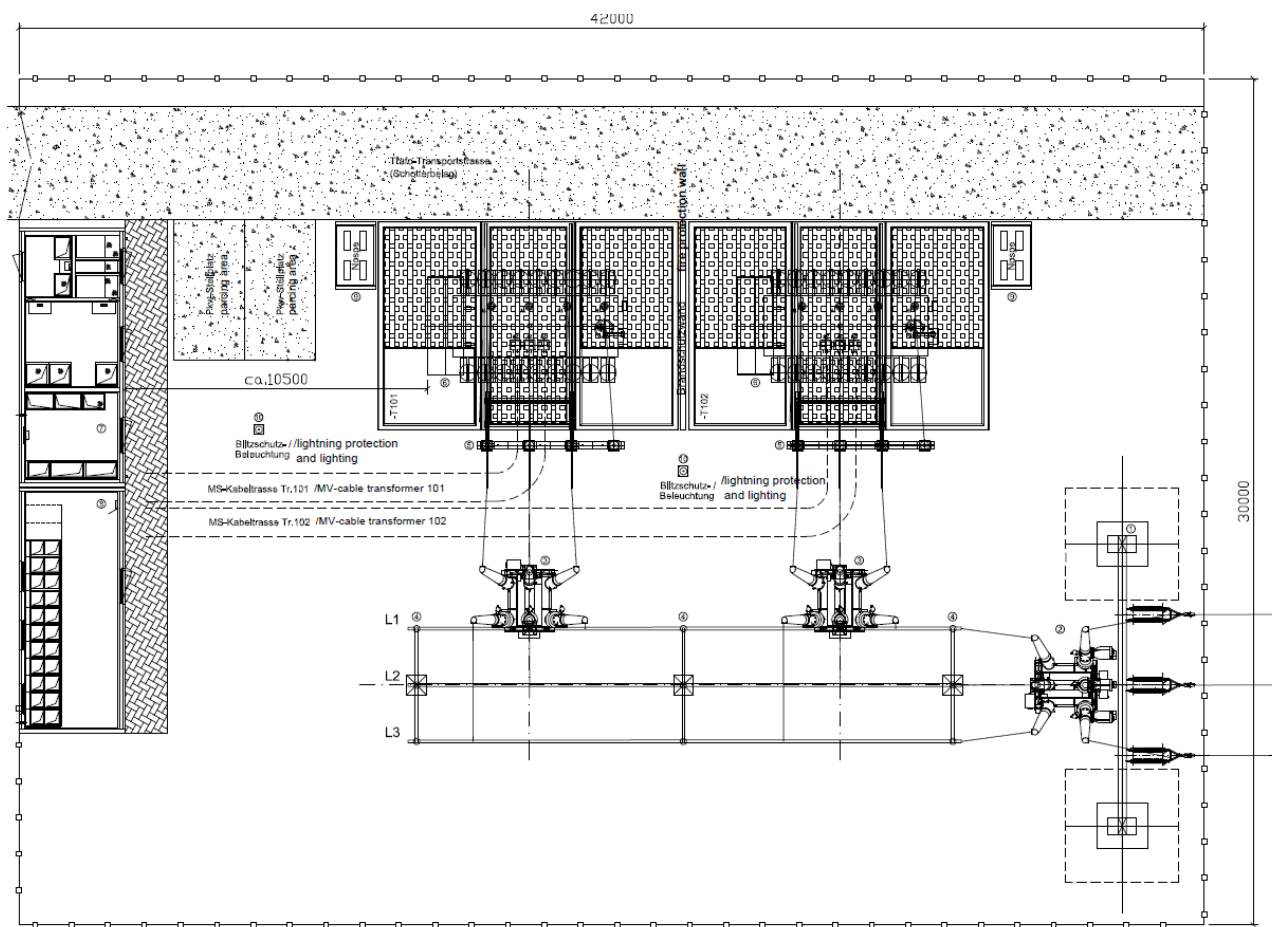


Figure 4: Project scheme of the Wind Farm Substation

3.3.3 Overhead Transmission Line

The new OHL will connect the wind farm substation situated in Bajgorë with the substation of Vushtri, part of the National distribution grid operated by KOSTT (Figure 5).

The OHL is about 19,5 km long and will consist of 92 pylons: 36 bearings and 56 angular type. Pylon no. 1 is located close to the possible port locations, so the connection can be easily done. The line passes through the existing Vushtri-Mitrovica road (Pylon 11 - Pylon no.12), some existing lines (low voltage lines) and a 10kV transmission line. The section from Pylon 1 to Pylon 16 is on a flat area. From Pylon no. 16 to Pylon no. 37 the morphology is hilly, with small valleys and steep flanks. From Pylon no. 37 to Pylon no. 92, the morphology is very hilly, with large and sloping valleys.

For easier construction and maintenance during operation, the route is located near several existing roads: from the Vushtria substation 1 lines pass through Vushtri-Mitrovica road, through an empty corridor, near the village Sllatinë, on the western side of the Banjske villages, Pasome and Tëren, continues on the eastern side of the village of Gumnishtë, the road passes near the village of Bajgora and then goes to the wind farm substation.

The connection of the OHL to the wind farm substation has not been determined but Pylon no. 92 is located near the possible gate, so the connection can be easily made.

The schematic drawing and dimension of the type of pylons that will be used is shown in Figure 5

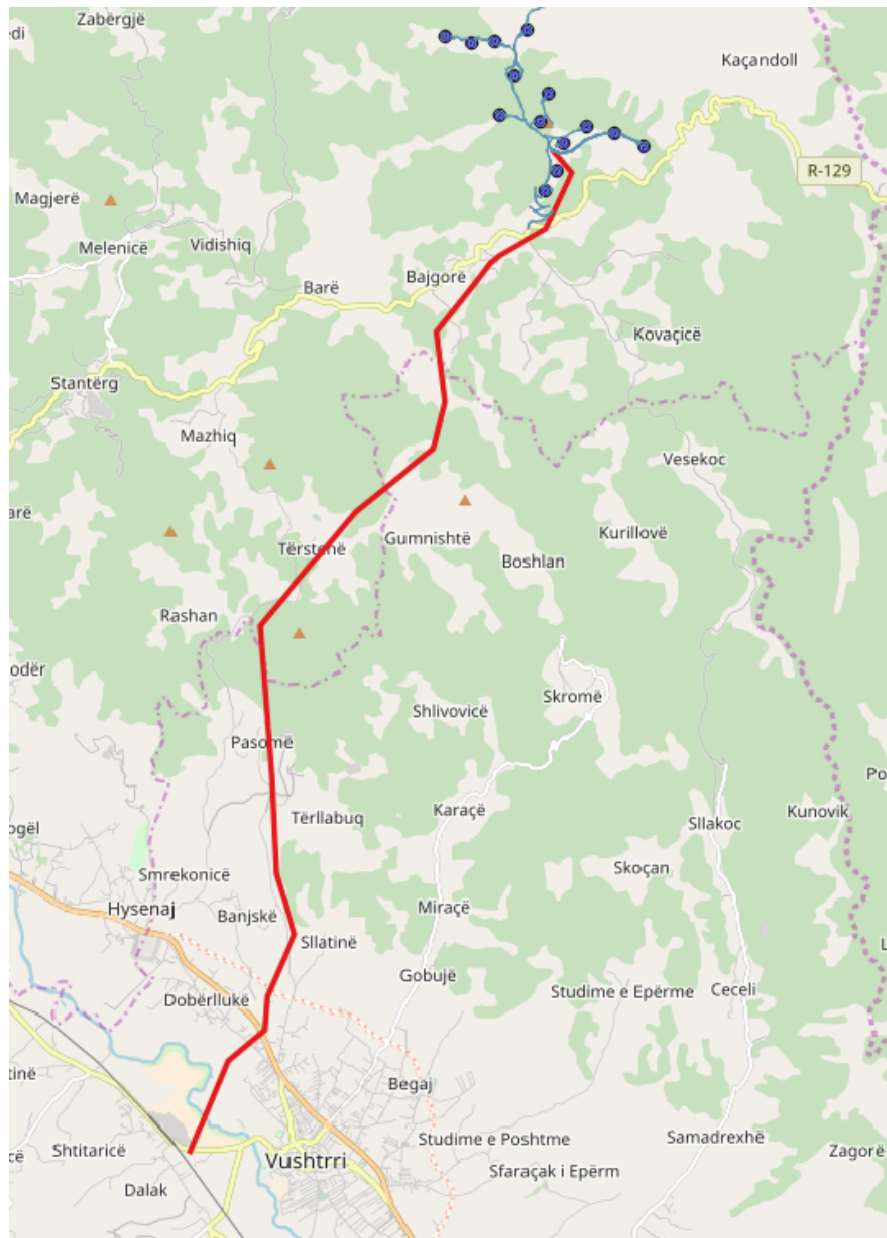
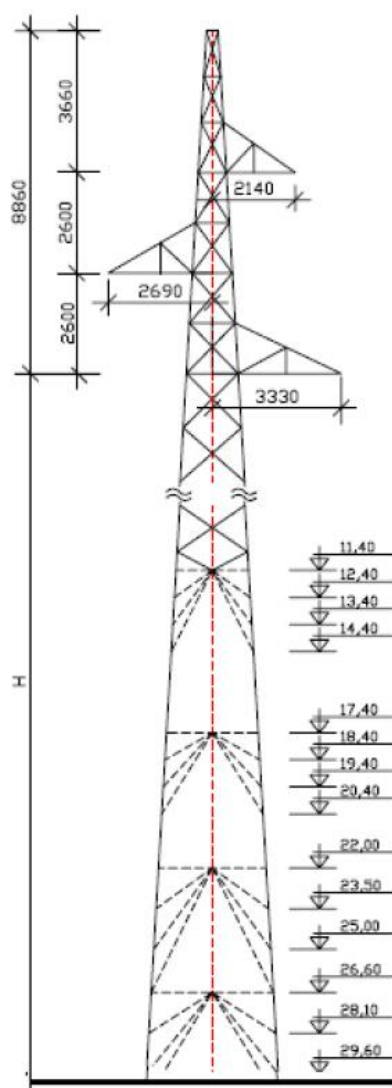


Figure 5: Route of the transmission line



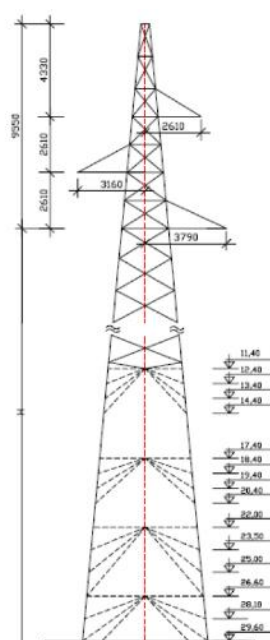
TENSION TOWER TYPE "J1"(150°- 180°) T/L 110kV S.C.

TOWER DATA

| | |
|---------------------|--|
| Tower type | J1 |
| Nominal Voltage | 110 kV |
| Conductors | 3x240/40 mm ² ACSR (Al/Fe 240/40mm ²) |
| Stress of Conductor | 9/9 daN/mm ² and 9/5 daN/m ² |
| Groundwire | 1x95/55 mm ² ACSR (EAlMg1 95/55mm ²) |

HEIGHT AND MASS OF THE TOWER

| | | | | | | | | |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| H(m) | 11.40 | 12.40 | 13.40 | 14.40 | 17.40 | 18.40 | 19.40 | 20.40 |
| W(kg) | 3158 | 3506 | 3638 | 3785 | 4231 | 4653 | 4817 | 4839 |
| H(m) | 22.00 | 23.50 | 25.00 | 26.50 | 26.60 | 28.10 | 29.60 | 31.10 |
| W(kg) | 5384 | 5994 | 6265 | 6613 | 6765 | 7251 | 7543 | 7908 |



TENSION TOWER TYPE "J3"(120°- 150°) T/L 110kV S.C.

TOWER DATA

| | |
|---------------------|--|
| Tower type | J3 |
| Nominal Voltage | 110 kV |
| Conductors | 3x240/40 mm ² ACSR (Al/Fe 240/40mm ²) |
| Stress of Conductor | 9/9 daN/mm ² and 9/5 daN/m ² |

HEIGHT AND MASS OF THE TOWER

| | | | | | | | | |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| H(m) | 11.40 | 12.40 | 13.40 | 14.40 | 17.40 | 18.40 | 19.40 | 20.40 |
| W(kg) | 3725 | 4178 | 4334 | 4550 | 5006 | 5925 | 5885 | 6161 |
| H(m) | 22.00 | 23.50 | 25.00 | 26.50 | 26.60 | 28.10 | 29.60 | 31.10 |
| W(kg) | 6084 | 6844 | 7219 | 7640 | 7225 | 7997 | 8342 | 8822 |

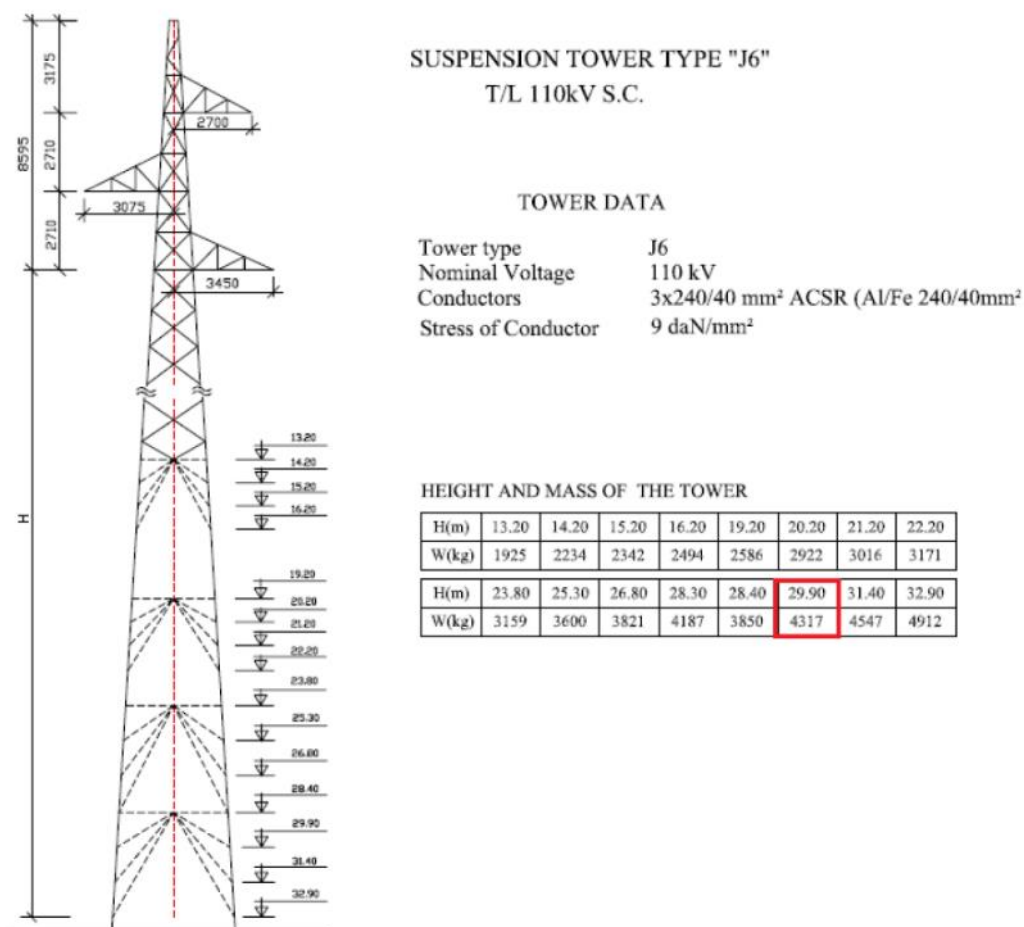


Figure 6: Layout of the three pylon typologies used in the OHL

3.4 Construction activities

Installation and commissioning includes the following steps, which can occur simultaneously in different areas:

- site preparation;
- installation of the OHL;
- cabling;
- adaptation of access roads;
- creation of storage areas;
- construction of deposit areas;
- construction of WTG foundations;
- construction of crane assembly pad;
- installation and erection of the WTG;
- installation of tower interiors;
- testing and commissioning;

- acceptance of wind turbine; and
- reinstatement of construction areas.

At the present stage the construction machinery is not yet defined and will depend on the choice of the construction contractor, who will need to comply with all technical and H&S standards, directives and measures.

3.4.1 Site preparation (Early works)

The first step of the planned construction works will include the following activities:

- installation of the subcontractor camp for road-construction;
- land levelling and excavations;
- reconstruction/adaptation of the existing access roads;
- excavation, blasting and profile levelling for the improvement of 600 m of the existing bypass road, which will be used in the early phases of construction activities.

Early works consisting in site installation and road construction works have been carried out from April to July 2019.

3.4.2 Installation of the Overhead Transmission Line

The construction of the OHL will include the following steps:

- construction of the access roads;
- excavation of the pylons' foundations;
- erection of the pylons; and
- cabling.

The typology of the pylons selected requires assembling on site of steel components, aided by the use of a crane and a platform for workers. The material for the pylons will be brought on site by trucks and the erection technique will depend of the

The land requirement for the OHL include land for the pylons' foundations and for the access road, which will be acquired from the owners, and the easement during operation which will be subject to limitations. Trees will need to be cut under the cables while agricultural and pastoral activities will continue without restrictions.

The duration of the activities for the installation of the OHL and the Substation is estimated in 14 months, from February 2020 to April 2021.



Figure 7: 110 kV pylon erection



Figure 8: OHL cabling

3.4.3 Internal Cabling

The route of the internal cables will follow the access roads to the wind turbine to connect them with the wind farm substation. The cables will be laid in trenches 0.5 – 1.75 m wide (depending on how many cables are laid) and 0.8 m deep, placed at 0.5 m from the road and from the slope, and the cables will be padded with soil.



Figure 9: Internal cabling trench with cable and padding material

3.4.4 Adaptation of the access roads

The main access to the site will be from the Mitrovica – Bajgora road. For most of the Wind Farm area new roads need to be constructed to reach the crane pads and the wind turbines locations. New and existing roads will have a width between 4 and 5 m and will be upgraded to secure a good access to heavy machinery and special transports. The curve radii and the structure of the roads will be built according to the load class specified by the manufacturer.

The approximate length of the roads in each wind farm area is:

- Selac I (WTG No. 1-9) – 7,300 m;
- Selac II (WTG No. 10-18) – 10,500 m;
- Selac III (WTG No. 19-27) – 7,100 m.

The road structure will need to be suitable for a load of 12 t/axle and maximum weight of 80 t. This will be ensured by placing the 3 different layers from bottom to top:

- subgrade layer – 30 cm;
- base layer – 10 cm crushed aggregate;
- surface layer – 8 cm asphalt mix.

The duration of the activities for the adaptation of the access roads, including land levelling and excavation for roads and crane pads, is estimated to be about 17 months, from May 2019.

3.4.5 At the end of the construction phase, main roads through the wind farm will be transferred to the Municipality. Creation of storage areas

During the construction phase, space will be needed for the storage of materials, equipment and wind turbine parts. Specific storage areas will be created through levelling and grading so to obtain flat surfaces suitable for the need. The list and approximate extension of these areas is provided in the table below. Their location is provided in Figure 10.

Table 4: List of storage areas

| Name | approximate area [m ²] |
|------|---------------------------------------|
| S1 | 20,000 |
| S4 | 2,000 |
| S7 | 8,000 |
| S14 | 3,600 |
| S18 | 4,800 |
| S19 | 17,000 |
| S21 | 4,500 |
| S25 | 5,300 |

At the end of construction activities these areas will be revegetated. The stored topsoil will be spread layer by layer and a vegetative cover will be ensured by different techniques, including seeding, hydroseeding, matting and shrub planting.

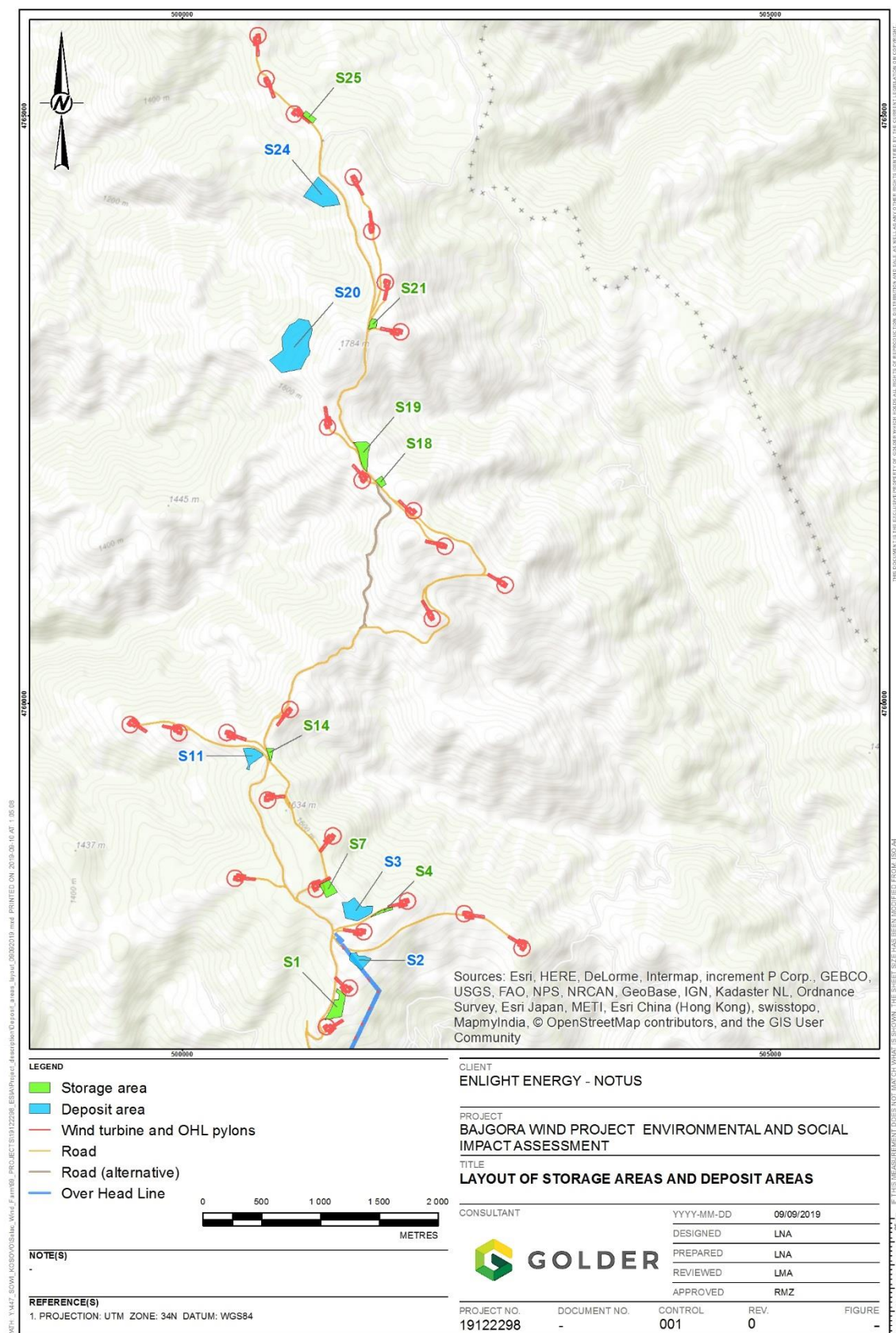


Figure 10: Layout of storage areas and of deposit areas

3.4.6 Construction of deposit areas

Excavated soil and rocks that cannot be used within the Project as backfilling and levelling material will be managed through the construction of permanent deposit areas.

The list and approximate extension, height and volume of these deposits is provided in the table below. Their location is provided in Figure 10.

Table 5: List of deposit areas

| Name | approximate area [m ²] | average height [m] | approximate volume [m ³] |
|------------|------------------------------------|--------------------|--------------------------------------|
| S2 | 15,000 | 2.5 | 37,500 |
| S3 | 30,000 | 3.0 | 90,000 |
| S11 | 15,000 | 4.0 | 60,000 |
| S20 | 100,000 | 2.5 | 250,000 |
| S24 | 45,000 | 4.0 | 180,000 |

The creation of these areas will involve the removal of vegetation and of the top soil, which will be stored and used for the final revegetation of the areas. A first layer of stable ground will be created and subsequently excess rocks and soil deriving from construction activities will be deposited and compacted. The deposited material will not be crushed. Once completed, all deposit areas will be revegetated. In order to obtain a surface suitable for the growth of vegetation, the final capping will have a stratigraphy as shown in the Figure 11. To avoid erosion at stock front/slope areas, an additional layer of rocks will be placed between the soil and the geotextile. The vegetative cover will be ensured by different techniques, including seeding, hydroseeding, matting and shrub planting.

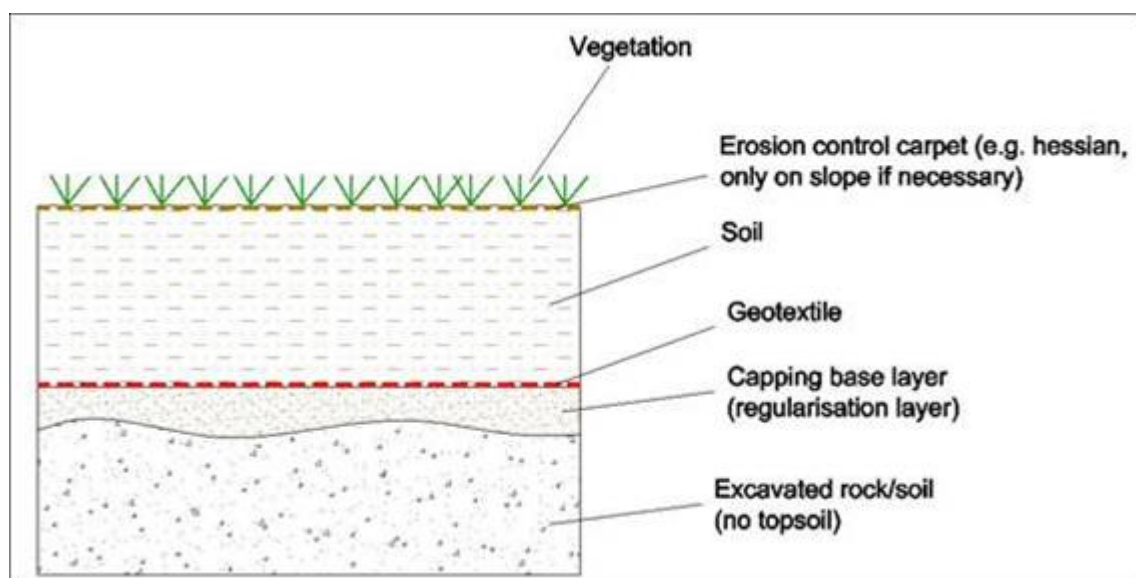


Figure 11: Stratigraphy of the capping layer for the deposit areas

3.4.7 Construction of the turbine foundations

The turbine foundations will be circular with a diameter of 19.5 m, except for one location where a foundation of 25 m diameter is needed according to the static calculations based on the geotechnical studies. Each foundation will require approximately 1,400 m³ of excavation and 600 m³ of concrete. Most of the excavated material will be used to backfill in and around the foundations to reduce the need for off-site transport and disposal of the excess material.

The excavation will be carried out with wheeled excavators for loose soil or excavators fitted with hydraulic hammer for excavation in small rocky areas, whereas blasting will be used in limited areas with a larger bedrock surface. Transportation will be done by truck and storage areas will be needed for the backfill material.

The duration of the construction of the turbines' foundations is estimated in 1 year from October 2019.



Figure 12: Wind turbine foundation construction

3.4.8 Construction of crane assembly pad

A platform that will be used as a crane surface, a pre-assembly surface and a bearing surface, will be built for each of the wind turbines. In the course of the wind tower erection, the platform will serve as an installation area for the crane as well as an assembly and storage area for parts of the wind turbines to be installed.

Due to the terrain, levelling will be necessary to obtain the flat structure suitable for the further work.

Before the arrival of the heavy machinery as truck and cranes, a top layer of 0 – 63 mm gravel and 40 cm thickness will be placed on the flattened land to reinforce the terrain.



Figure 13: Crane on a crane pad

3.4.9 Transportation of the wind turbines

A Route Survey Report has been carried out by ZAGREBTRANS (May 2019) to assess the suitability of road infrastructures to oversize transport along the route from the port of Durrës, Albania, to the wind farm area (about 340 km). The study identifies the locations where construction works are needed (mostly extension of the road) and provides operating instructions. For further details see the Route Survey Report (**ANNEX A**).



Figure 14: Blades transport on highway



Figure 15: Blades transport on mountain road

3.4.10 Installation of the Wind Turbine Generators (WTG)

Wind turbines are composed of a tower, a 3-blade rotor, and a nacelle which houses all the gears, generators and electrical conversion equipment. All the components are delivered and laid out on the temporary crane pad and assembly areas adjacent to the wind turbine foundations.

The wind turbine tower will be 110 m high. The tower will be initially segmented and will require bolting during installation. Assembly begins by bolting the tower base section to the foundation pedestal using a pneumatic wrench. Other parts of the towers will be progressively mounted by bolting. Following, the nacelle with already installed hub will be lifted by crane and installed at the top of the tower. Next, the hub will be connected to the main shaft of the nacelle. As the last step of the installation of the wind turbine, the rotor blades will be attached to the hub. Each turbine takes about 4 to 5 days to erect from offload to completed assembly.

The duration of the activities for the installation and erection of the WTGs is estimated in 6.5 months from May 2020.



Figure 16: Wind tower erection

3.4.11 Installation of tower interiors, Testing and commissioning, Acceptance of wind turbine

The activities for tower interiors installation, testing & commissioning, and acceptance of wind turbines are expected to take from June to December 2020.



Figure 17: Internal cabling

3.4.12 Reinstatement of work areas

At completion of commissioning, all working sites will be reinstated to their original state, with the exception of the areas needed for maintenance which will be minimized. The stored topsoil will be spread layer by layer and a vegetative cover will be ensured by different techniques, including seeding, hydroseeding, matting, trees and shrub planting.

The duration of the reinstatement activities is estimated in six months after commissioning, depending on the season and the ground conditions.



Figure 18: Example of hydroseeding

3.4.13 Construction schedule

The construction activities are listed in the following table (Table 6), together with their duration (in days). The schedule and relative contracts with contractors will take into account that construction activities may slow down or be suspended in the months between November and March, due to weather conditions and presence of snow. Activities will be performed only during the day, no construction activities are planned at night-time. During summer months it will be possible to work on two shifts, from 5 am to 9 pm.

Based on that, the work schedule is provided in the Figure 19 .

Table 6: Project Construction Works and Duration

| N. | ACTIVITY | START DATE | DURATION (Days) | END DATE |
|----|---|------------|-----------------|------------|
| 1 | Site preparation (WF) | 18/04/2019 | 18 | 06/05/2019 |
| 2 | Mobilization of personnel and equipment (WF) | 06/05/2019 | 1 | 07/05/2019 |
| 3 | Adaptation of access roads (including land levelling and excavations for roads and crane pads) - WF | 06/05/2019 | 508 | 25/09/2020 |
| 4 | Mobilization of personnel and equipment (OHL) | 19/08/2019 | 5 | 24/08/2019 |
| 5 | Land levelling and excavations (OHL) | 01/09/2019 | 182 | 01/03/2020 |
| 6 | Installation of the OHL | 01/09/2019 | 274 | 01/06/2020 |
| 7 | OHL Cabling | 01/03/2020 | 92 | 01/06/2020 |
| 8 | Adaptation of access roads (OHL) | 01/09/2019 | 182 | 01/03/2020 |
| 9 | Substation WF Selac I 110/33 kV (incl. Testing and commissioning) | 15/08/2019 | 426 | 14/10/2020 |
| 10 | Substation Vushtrri 110/35 kV (incl. Testing and commissioning) | 01/05/2020 | 123 | 01/09/2020 |
| 11 | Energization | 15/10/2020 | 1 | 16/10/2020 |

| N. | ACTIVITY | START DATE | DURATION (Days) | END DATE |
|-----|--------------------------------------|------------|-----------------|------------|
| 12 | Internal Cabling | 06/09/2019 | 385 | 25/09/2020 |
| 13 | Construction of WTG foundations | 02/10/2019 | 379 | 15/10/2020 |
| 13a | Transportation of turbine components | 04/05/2020 | 87 | 30/07/2020 |
| 13b | On site assembly of the turbines | 01/06/2020 | 169 | 17/11/2020 |
| 14 | Installation of WTGs | 01/06/2020 | | 17/12/2020 |
| 14a | Installation of tower interiors | 01/06/2020 | 169 | 17/11/2020 |
| 14b | Testing and commissioning WTGs | 24/10/2020 | 44 | 07/12/2020 |
| 14c | Acceptance of wind turbine | 03/11/2020 | 44 | 17/12/2020 |
| 15 | Reinstatement of work areas | 27/03/2021 | 90 | 27/06/2021 |

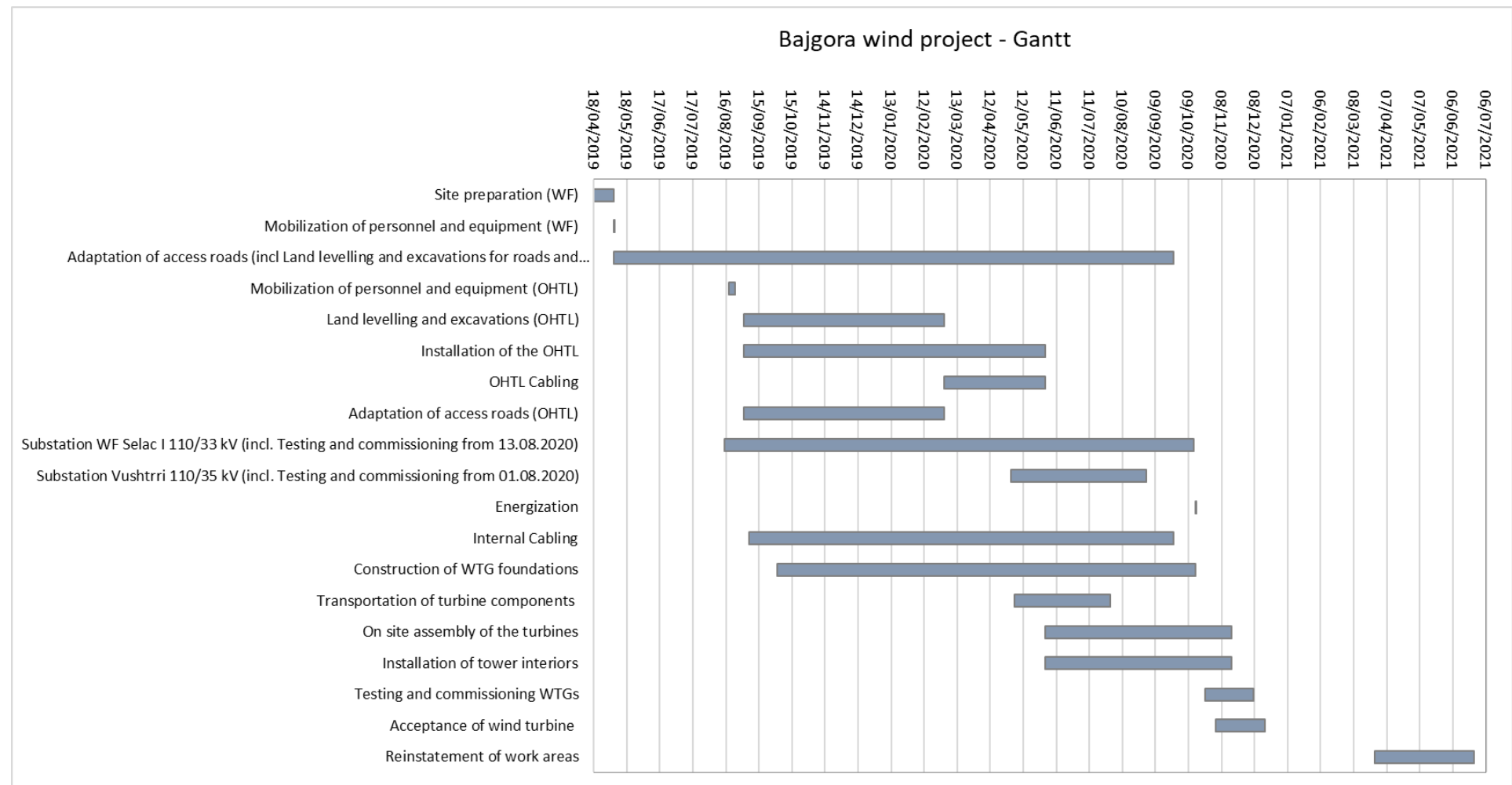


Figure 19: Project Work Schedule

3.4.14 Waste generated during construction

Each company (subcontractor) is contractually obliged to clear its construction site waste. Details are provided in the Waste Management Plan of the ESMP, as part of the Disclosure Package.

3.4.15 Goods/service purchased locally and their estimated value

Goods/service purchased locally, and their estimated value are listed in the following table.

Table 7: Goods/Service purchased locally and their estimated value

| Works | Estimated Value (€) |
|---|---|
| Roads works and crane pads goods/services | Approx. 7 million |
| Foundation works | At the present stage no cost offer for concrete and steel from Kosovo |
| OHL pylons, foundations and cables ¹ | 3.4 million |

3.5 Operational activities

The operation of the wind farm will last at least for 12 years, which is the duration of the Feed-in Tariff (FiT) and the Power Purchase Agreement. Since the life expectancy of the wind turbines is 25 years, the project developer might consider to further extend its operation up to 25 years. For the operation of the WF, SOWI will establish a Balance of Plants contract for the overall operation and maintenance activities of the WF, excluding the turbines. In this case, a separate Full Service Agreement will be established with the turbine supplier, who will be in charge for the operation and the maintenance of the turbines. SOWI will have full control and authority of all operations, as secured by the above contracts

3.5.1 Electricity production

The electricity produced by the Wind Farm will be transferred to the connection point via 110kV TS (transformer station) located some 19.5 km away from the site at the TS 110/35 kV in Vushtrri. Produced electricity will be sold to KOSTT as per the power purchase agreement (PPA).

3.5.2 Waste generated during operations

Wastes produced during operation will include those related to the presence of workers and those related to the maintenance of the turbines and substation. The waste categories that can be expected include:

- domestic waste from offices and facilities;
- construction wastes from small demolition activities related to extra-ordinary maintenance;
- used lubricant oils;
- absorbent materials contaminated by lubricant oils;
- metal scrap from extra-ordinary maintenance.

¹ Cables, OHL foundations will mostly be imported as they are not available in Kosovo

3.5.3 Maintenance

Scheduled regular maintenance to ensure proper functioning of the Bajgora Wind Project will be carried out by a dedicated maintenance team. Scheduled maintenance activities will include inspections, changes of lubricant oils and other consumables and maintenance of the access roads and other working areas. It is foreseen that regular maintenance will require approximately 40 h/year. Vegetation control will be carried out when required minimizing the use of herbicides and favouring the use of manual removal or mechanized cutting.

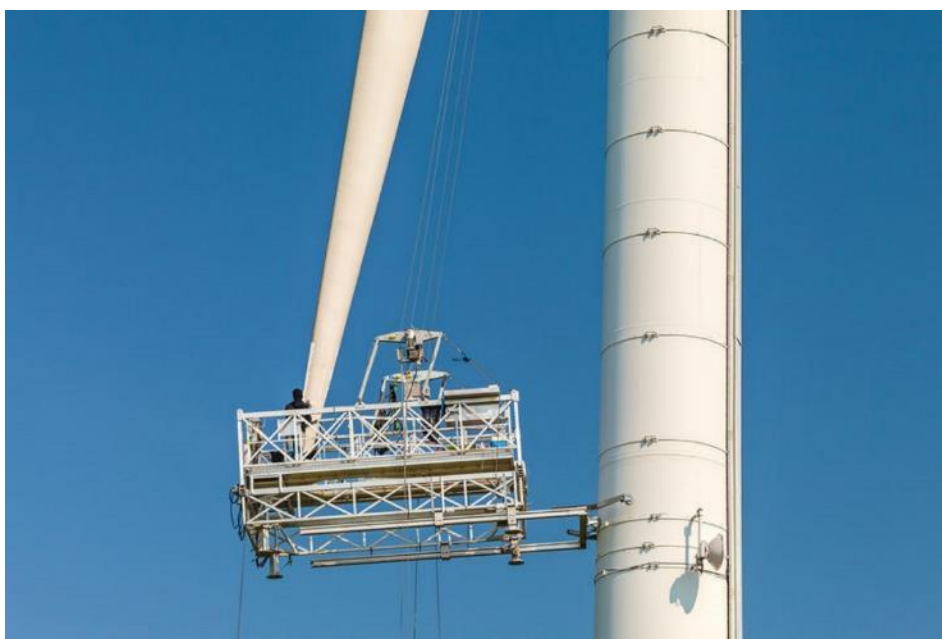


Figure 20: Maintenance of turbine blades

3.6 Decommissioning activities

Decommissioning of the wind farm will follow local legislation and international guidelines on environmental best practices. The turbines and other above-ground components will be dismantled and removed while the foundations will be removed from the ground as much as technically feasible and required by legislation and all project areas will be restored as close as possible to their original conditions.

3.6.1 Recycling

Decommissioning of the wind turbines has a high potential to generate recyclable material, which are found in different components, including:

- Metals (steel, copper);
- Plastics;
- Concrete;
- Fiberglass.

A decommissioning plan has not yet been developed for the project, considering that the reuse and recycling techniques in the sector are rapidly evolving and might include novel disruptive practices in the next decade. A detailed decommissioning plan will be prepared at least two years in advance of the planned end of life of the project

3.6.2 Disposal

Non-recyclable materials, including hazardous waste, will be delivered to authorized companies for disposal in licensed and controlled disposal or treatment facilities.

3.7 Workforce Project Requirements

The workforce employed during construction and operation is summarized in the Table 8.

Table 8: Workforce employed during construction and operation

| Activity | Workers | Origin |
|------------------------------|--|--|
| Road construction | max. 40 workers | no expats so far |
| Foundation construction | 20 workers | expats only |
| Internal cable route: | 3 teams with 5 members = 15 | no expats |
| WF operation team | 1 Manager of the WF 2/3 Operators 2/3 Maintenance technicians | no expats |
| Substation: | 2 teams with 7 members = 14 approx. 5 technicians and engineers | no expats external expats from the responsible Subcontractor for Substation |
| OHL construction | 3 teams with 30 members = 90 | no expats |
| Engineering and office staff | 7 members | no expats |
| Security | Max 10 workers | no expats |

The Project, to the extent possible, will supply its workforce from local communities (i.e. communities within the municipalities where the Project is located) since multiple tasks such as cable laying, security, cleaning, etc. would allow employment of local workforce. Contractors will be contractually required to maximise use of local workforce in the Project. Project works are planned to be conducted in one shift that will consist of nine hours. In case of necessity, additional shifts could be planned due to technical requirements (e.g. achieving suitable wind speeds needed for turbine erection) during the construction stage. Local workforce will be sourced in the surrounding areas to the extent the skills and qualifications needed are available, and otherwise in other regions of Kosovo.

3.8 Connection to existing infrastructures

3.8.1 Main access to the site

Site will be accessed through the main road connecting to the Pristina-Mitrovica highway, which is in good condition up to the gates of the project site.

3.8.2 Water supply

Water supply will be ensured by mobile tanks and have enough capacity to serve to the workers of the site for their sanitary purposes. Also, it should be considered that water resources used for the wind farm operation are minimal and can be provided again by mobile tanks. No local water sources like springs and wells will be

used during the project and the water needed will be sourced according to the recommendations of the relevant authorities.

3.8.3 Electricity supply

Electricity to be used during construction will be provided via diesel generators.

During operation, the energy for internal consumption by low voltage electric equipment, substation and SCADA equipment will be self-produced. In situations of low wind speed (below 3 m/s) or too fast wind (exceeding 25 m/s), when the turbines will not be operational, the power required for monitoring, control and data transmission will be supplied via one auxiliary transformer with a voltage of 33/0,4 kV, which will be backed/up by a diesel generator.

3.9 Permits, Licences and Approvals

National permits, licenses and approvals required for construction and operation of the Bajgora Wind Project are listed in Table 9 and the status of the permitting process (at July 2019) is provided.

Table 9: Current status of permits, licenses and approvals for the Project (July 2019)

| No. | Permit name | Related Authority/Entity | Type of permit | Permit related to | Issuing date | Expiration date |
|------------------|---|---|----------------|-------------------|----------------------------------|-----------------|
| Wind Farm | | | | | | |
| 1 | Extract from Municipality of Mitrovica for land utilization | Municipality of Mitrovica | Consent | WF | 14.02.2018 | Indefinite |
| 2 | Memorandum of Understanding on use of public land plots | Municipality of Mitrovica | Contract | WF | 23.03.2018 | |
| 3 | Contract with Municipality of Mitrovica | Municipality of Mitrovica | Contract | WF | | |
| 4 | Extract from MESP for land utilization | Ministry of Environmental and Spatial Planning (MESP) | Consent | WF | 05.03.2018 | Indefinite |
| 5 | Contract with Kosovar Forest Agency + Amendment | Ministry of Agriculture, Forestry and Rural Development | Contract | WF | 13.10.2017 Annex: 19.04.2018 | 13.10.2022 |
| 6 | Environmental Consent + Update | Ministry of Environmental and Spatial Planning | Consent | WF | 02.02.2017 Update: 24.01.2018 | Indefinite |
| 7 | Environmental Impact Assessment + EIA update | Ministry of Environmental and Spatial Planning | Report | WF | 22.11.2017 Update: 14.12.2018 | Indefinite |
| 8 | Felling Trees Approval | Ministry of Agriculture, Forestry and Rural Development | Permit | WF | 15.03.2019 | Indefinite |
| 9 | Archaeological consent | Archaeological Institute of Kosovo | Consent | WF | 11.12.2017 | Indefinite |

| No. | Permit name | Related Authority/Entity | Type of permit | Permit related to | Issuing date | Expiration date |
|-----|---|---|----------------|-------------------|---|-----------------------------------|
| 10 | Border distance Consent | Ministry of Internal Affairs | Consent | WF | 20.03.2018 | Indefinite |
| 11 | Kosovo Police | Ministry of Internal Affairs | Consent | WF | 16.03.2018 | Indefinite |
| 12 | Emergency Management Agency | Ministry of Internal Affairs | Consent | WF | 01.03.2018 | Indefinite |
| 13 | Consent from Department of Public Service, Environment and Inspection | Municipality of Mitrovica | Consent | WF | 14.02.2018 | Indefinite |
| 14 | Construction Conditions + Update | Ministry of Environmental and Spatial Planning | Permit | WF | 17.05.2018 Update: 12.03.2019 | 17.05.2020 Update: 12.03.2021 |
| 15 | Construction Permit + Update | Ministry of Environmental and Spatial Planning | Permit | WF | 23.05.2018 Update: 05.04.2019 | 23.05.2019 Update: 05.04.2020 |
| 16 | Roads Construction Permit | Municipality of Mitrovica (based on Construction Permit by MESP) | Permit | WF | <u>Preliminary consent:</u> 20.03.2019 | - |
| 17 | Mine Action Centre Conditions | Ministry for the Kosovo Security Forces (MKSF) | Consent | WF | | |
| 18 | Preliminary Authorization | Energy Regulatory Office | Consent | WF / Grid | 25.11.2016 Extension (issued): 29.03.2018 | 25.11.2017 Extension: 25.05.18 |
| 19 | Final Authorization – modification 2019 | Energy Regulatory Office | Consent | WF / Grid | 10.07.2019 | 13.06.2020 |
| 20 | Preliminary consent | KOSTT | Consent | WF / Grid | 09.03.2018 | - |

| No. | Permit name | Related Authority/Entity | Type of permit | Permit related to | Issuing date | Expiration date |
|-----|---|--|----------------|-------------------|---|-----------------|
| 21 | Grid Connection Agreement | KOSTT | Agreement | WF / Grid | Selac 1 - 05.11.2018 Selac 2/ Selac 3 - 28.12.2018 | Indefinite |
| 22 | Government support agreement (Strategic Investor) | Government of Republic of Kosovo | Statement | WF | 05.02.2019 | 5 Years |
| 23 | Land plot splitting approval | Land Registration Office | Approval | WF | | |
| 24 | Land lease agreements | Between Company and Landowner | Agreement | WF | | |
| 25 | Aviation Authority Consent and Conditions | Civil Aviation Authority | Consent | WF | | |
| 26 | Easement registration approvals | Between Company and Landowner | Agreement | WF | | |
| 27 | Occupancy Certificate | Ministry of Environmental and Spatial Planning | Certificate | WF | | |
| 28 | Power Purchase Agreement | KOSTT | Agreement | WF / Grid | | |
| 29 | Energy Generation License | Energy Regulatory Office | Licence | WF / Grid | | |
| 30 | Power supply agreement | Energy Regulatory Office / KOSTT | Agreement | WF / Grid | | |
| 31 | Grid usage agreement | KOSTT | Agreement | WF / Grid | | |
| 32 | Environmental Authorization of deposit areas for soil containing asbestos | Ministry of Environment | Consent | WF | | |

| No. | Permit name | Related Authority/Entity | Type of permit | Permit related to | Issuing date | Expiration date |
|------------------------------------|---------------------------------------|---|----------------|-------------------|--------------|-----------------|
| Over Head Transmission Line | | | | | | |
| 32 | Environmental Consent | Ministry of Environmental and special Planning | Consent | OHL | 07.06.2019 | Indefinite |
| 33 | Environmental Impact Assessment (EIA) | Ministry of Environmental and spatial Planning | Report | OHL | | |
| 34 | Felling Trees Approval | Ministry of Agriculture, Forestry and Rural Development | Permit | OHL | | |
| 35 | Construction Conditions | Ministry of Environmental and Spatial Planning | Permit | OHL | | |
| 36 | Construction Permit | Ministry of Environmental and Spatial Planning | Permit | OHL | | |
| 37 | Final Decision on Expropriation | Ministry of Environmental and Spatial Planning | Consent | OHL | 26.07.2019 | - |
| 38 | Land plot splitting approval | Land Registration Office | Approval | OHL | | |
| 39 | Land lease agreements | Between Company and Land owner | Agreement | OHL | | |
| 40 | Easement registration approvals | Between Company and Land owner | Agreement | OHL | | |
| 41 | Occupancy Certificate | Ministry of Environmental and Spatial Planning | Certificate | OHL | | |
| 42 | Archaeological consent | Archaeological Institute of Kosovo | Consent | OHL | 11.04.2019 | Indefinite |



REPORT

Bajgora Wind Project
Environmental and Social Impact Assessment
Section 4 - Alternative Analysis

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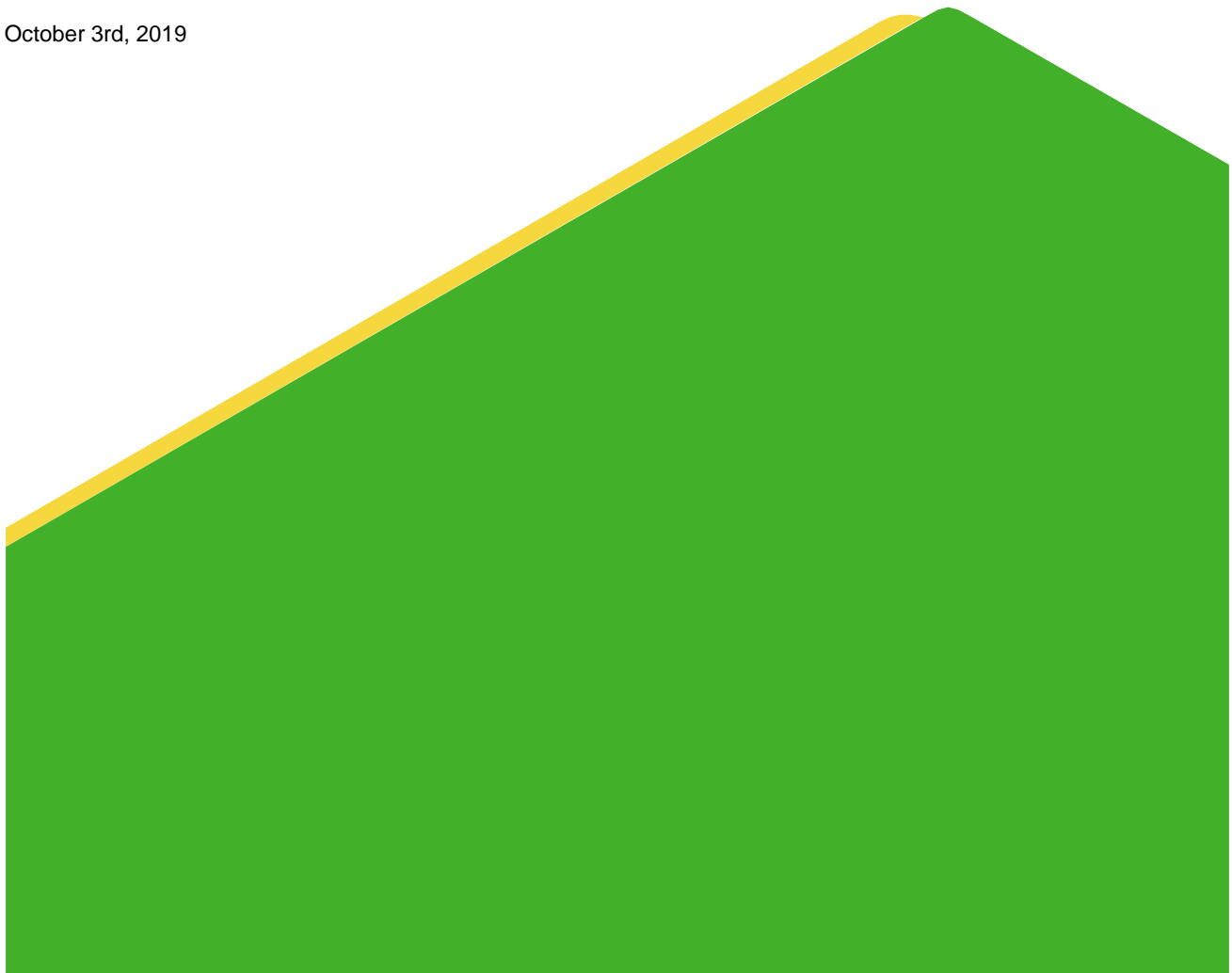


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4.0 ALTERNATIVE ANALYSIS

4.1 Strategic alternatives

Kosovo is one of the few countries in Europe with vast lignite reserves and has historically relied in thermal power plants for the majority of the electricity generation which accounts for around 98%. There are two existing lignite power plants, namely Kosovo A built in the 60's and Kosovo B built in the 80's, both plants are already at the end of their life and heavy polluters of Kosovo's environment.

With the introduction of the latest legislation on renewable energy and commitments taken with signing the Energy Community treaty, Kosovo has made progress in enabling renewable energy investments including wind energy. Although currently Kosovo seems far from fulfilling the commitments for 29% RES electricity generation, it is moving slowly toward this goal.

As a land-locked country, not having many hydro power resources, Kosovo government has already frozen the unfilled quotas for the hydro power generation under the Feed in Tariff scheme and decided not to issue new authorization for this type of energy source until further notice. The main reason for this decision is the environmental impact caused by plants in operation and under construction. Therefore, the government is looking at options to increase the quotas for wind and solar energy.

The main advantage of wind energy over solar energy is lower land use, since wind energy turbines occupy only small plots of land (foundations and access roads) thus enabling other activities such as agriculture, grazing, hunting or recreational activities to continue with minor limitations. For an equal installed power, in case of solar energy a much higher amount of land must be used, (usually 2 hectares for 1 MW of installed capacity). Typical locations for solar energy are flat areas which are suitable for agricultural activities, which in the case for Kosovo, represent only about 50% of its total surface.

4.2 No project Option

Kosovo has defined targets for the introduction of renewable energy which include the installation of 150 MW of wind power by 2025, and the Project has a high potential to contribute to achieving this target. Failure to implement the project would likely slow down the achievement of the renewable energy targets set by the Kosovar government, and negatively contribute to the reduction of CO2 emissions which is a global objective set by many international agreements including the 2015 Paris agreement.

4.3 Location selection

4.3.1 Wind Farm

According to the Wind Atlas of the Balkans (<https://balkan.wind-index.com/>) the Bajgora mountain range is the only area with the highest wind potential that is completely within the territory of the Republic of Kosovo.

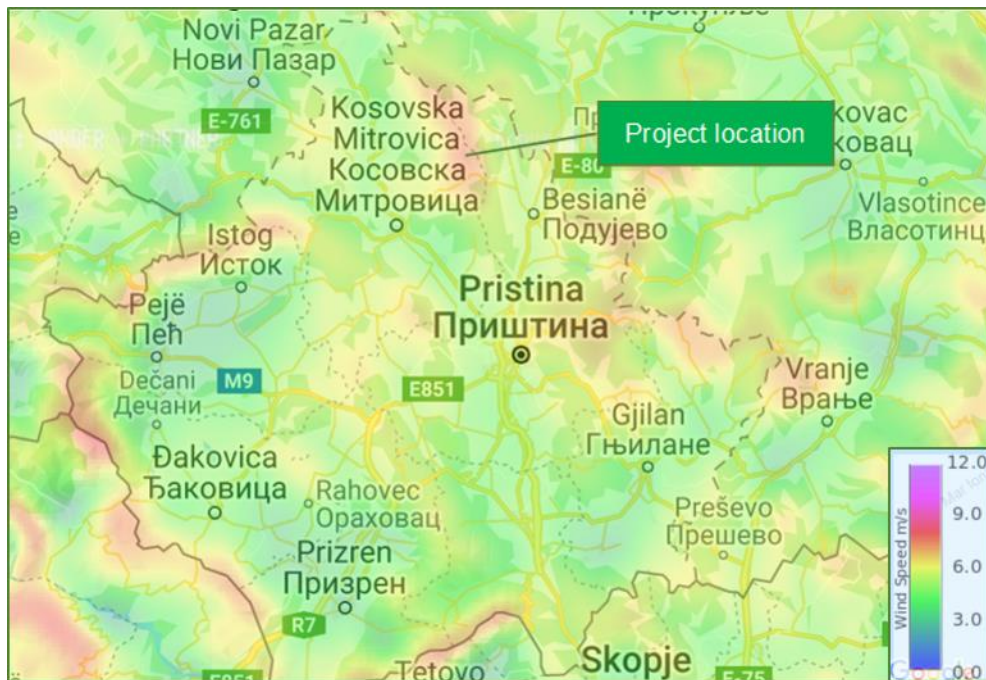


Figure 1: Excerpt of the Wind Atlas of the Balkans with indication of the Project location

Apart from the wind potential, this mountain range has been chosen taking into account a series of technical, environmental and social criteria, further described below. The final Project layout was the outcomes of a two-step process, which firstly included the identification of the most suitable area for the WF, and the siting the individual WTGs in the best possible location, taking into account the criteria below to the extent feasible.

- Keep minimum distances between turbines considering turbulences;
- Consider wind speed: significant differences in possible yield can be obtained from micro siting;
- Select areas with flat and even morphology, to avoid excavations as much as possible: this has implications also from an environmental and social perspective, as it reduces the extension of the area needed for the Project and reduces the amount of soil that has to be eventually transported off site;
- Select areas accessible from existing roads wherever possible, to avoid having to build new access roads: reducing the need of new roads leads to benefits from an environmental and social perspective, as it reduces the overall Project footprint. The Project area was selected because of its accessibility and the presence of existing roads that could be used during the construction phase. As further described, final layout of the WTGs went through substantial revisions, to reduce the overall need of building new access roads;
- Avoid locating the Project within protected areas for migratory species: the project area was selected at the border of the a large IBA because no other viable alternatives in Kosovo exist for development of the project in habitats of lesser biodiversity value and the Project is not anticipated to lead to a net reduction in the population of any endangered or critically endangered species, over a reasonable time period. However, a robust and appropriately designed, long-term biodiversity monitoring and evaluation programme aimed at assessing the status of critical habitat is integrated into SOWI's adaptive management programme. Moreover, according to PR10, stakeholder consultation included sharing the mitigation measures with Birdlife representation.

- Align the Project with local regulations: before selecting the Project area, local regulations and local development plans were consulted, to ensure that the Project was compliant with regulations and in line with community development goals and objectives;
- Keep distance from houses and settlements: the Project area and the siting of the WTGs were defined so to reduce interferences with existing houses and settlements. The Project area is located at a high altitude, where the presence of houses and settlements is limited due to climatic conditions. This reduces overall interferences with people and economic activities;
- Avoid physical displacement and resettlement: the Project area and the siting of the WTGs were defined so to avoid the need of physical displacement of persons and families;
- Reduce economic displacement: the Project area and the siting of the WTGs were defined so to avoid economic displacement to the extent possible. The location at a high altitude means that farming activities are limited due to climatic conditions.

Based on the criteria described above, the Bajgora Project area was selected because it offered a suitable balance between technical, environmental and social aspects.

Throughout the design process, a series of changes were made to the original Project layout and the positioning of a number of WTG. The intent of these changes was mainly to reduce having to build new access roads, which decreases overall costs, but also reduces potential impacts from an environmental and social standpoint. For this reason, at the end of the siting and design process, three WTG were discarded, reducing the overall number of turbines from 30 to 27.

The figures below show the different Project layouts considered throughout the siting and design process, which lead to the final Project layout (see Figure 2 in Section 3).

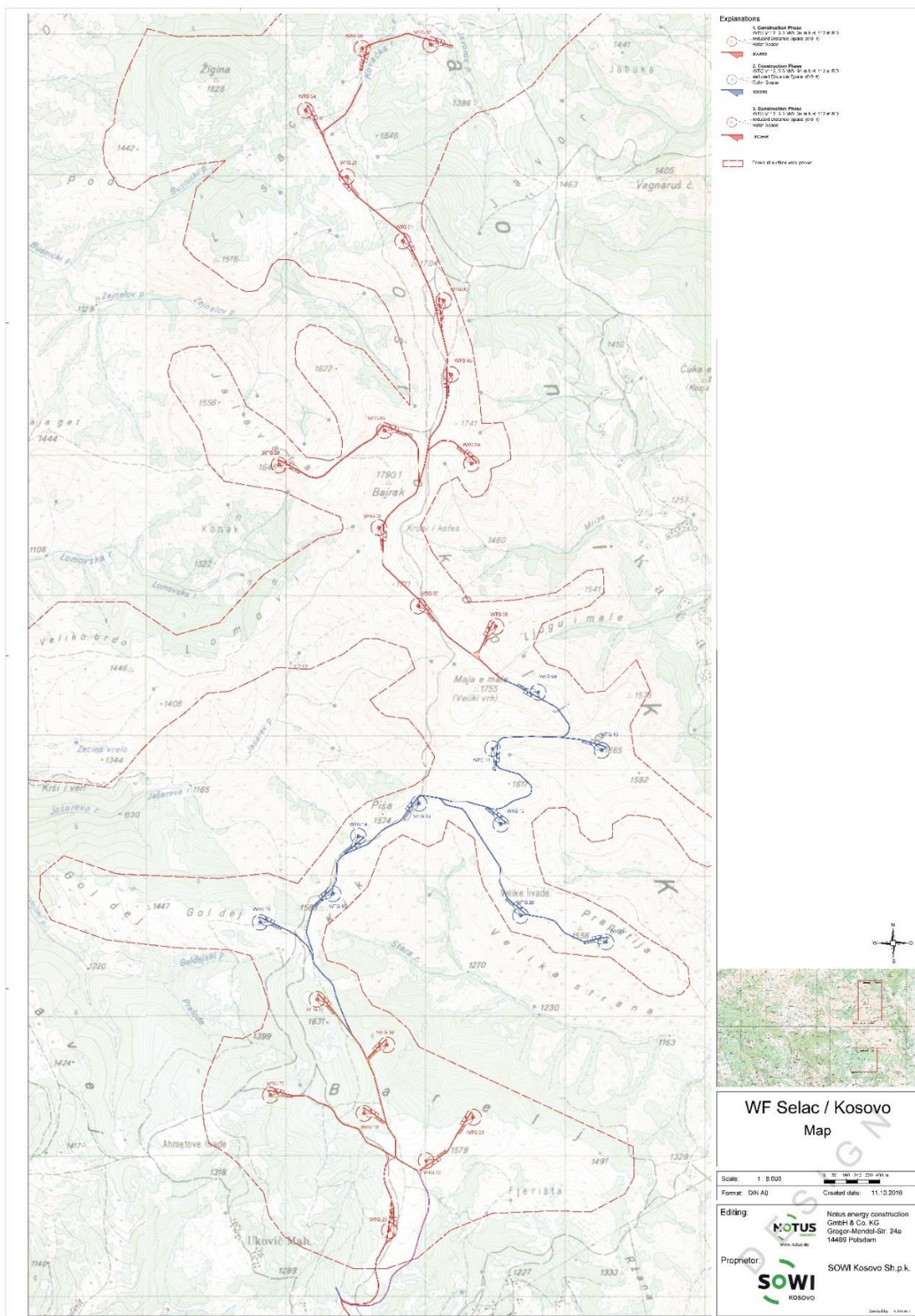


Figure 2: Initial Project layout in 2016



Figure 3: Interim Project layout in 2017

4.3.2 Overhead Line

For the connection of the WF to the national distribution grid, two possible substations operated by KOSTT were considered, one in the city of Mitrovica and one in the city of Vushtrri. The connection to these two substations entailed very different routings for the OHL. The substation in Vushtrri was finally selected, mainly due to a series of technical and social criteria. From a technical standpoint the substation of Vushtrri can better accommodate additional power coming from the WF and is in a more central position within the overall grid system.

From a social perspective, the OHL going to Mitrovica would have been located along an existing road where several settlements are present. This option would have therefore created higher interferences between the OHL and houses, economic activities and public facilities (e.g. health centres). Similarly, to the siting of the WF, the selection of the OHL corridor and the location of the pylons took into account a series of technical, environmental and social criteria further described below.

- Select areas with flat and even morphology, to avoid excavations as much as possible: this has implications also from an environmental and social perspective, as it reduces the extension of the area needed for the Project and reduces the amount of soil that has to be eventually transported off site;
- Select areas accessible from existing roads wherever possible, to avoid having to build new access roads: reducing the need of new roads leads to benefits from an environmental and social perspective, as it reduces the overall Project footprint. The OHL corridor was selected because of its accessibility and the presence of existing roads that could be used during the construction phase (see Figure 4);
- Avoid locating the Project within protected areas: the project area was selected so to avoid protected areas, the closest protected area is the Kopaonik National Park in Serbia, situated more than 25 km from the Project;
- Keep distance from houses and settlements: the OHL corridor and the siting of the pylons were defined so to reduce interferences with existing houses and settlements. The minimum distance applied was of 4 meters between the horizontal electrical distance of the most external conductor for his maximal inclination angle to the building walls. Moreover, the corridor passes through an area with a relatively limited presence of houses and settlements, thus reducing overall interferences with people and economic activities;
- Sensitive receptors were identified through a walkover survey in the OHL Aol and through the analysis of maps and aerial photographs. The identification of sensitive receptors was done in the context of a series of studies, including: Assessment of Electric and Magnetic Field, Noise Assessment and Visual Impact Assessment. Sensitive receptors include any residential buildings, farms, hotels, hospitals, schools and cultural heritage sites;
- Avoid physical displacement and resettlement: the Project area and the siting of the WTGs were defined so to avoid the need of physical displacement of persons and families;
- Reduce economic displacement: the Project area and the siting of the WTGs were defined so to avoid economic displacement to the extent possible.

Throughout the design process, a series of changes were made to the original OHL routing and the positioning of the pylons. In particular in the northern section of the OHL, discussions were brought ahead with landowners, and a different route passing more to the east of the original layout was agreed, so to reduce overall impacts on existing farming activities. In the southern section of the OHL, where the line intersects the road connecting Vushtrri to Mitrovica, an area with lower presence of houses was selected for the location of the pylons. Finally, the pylons were located keeping into consideration the footprint of the planned motorway that will connect Vushtrri to Mitrovica.

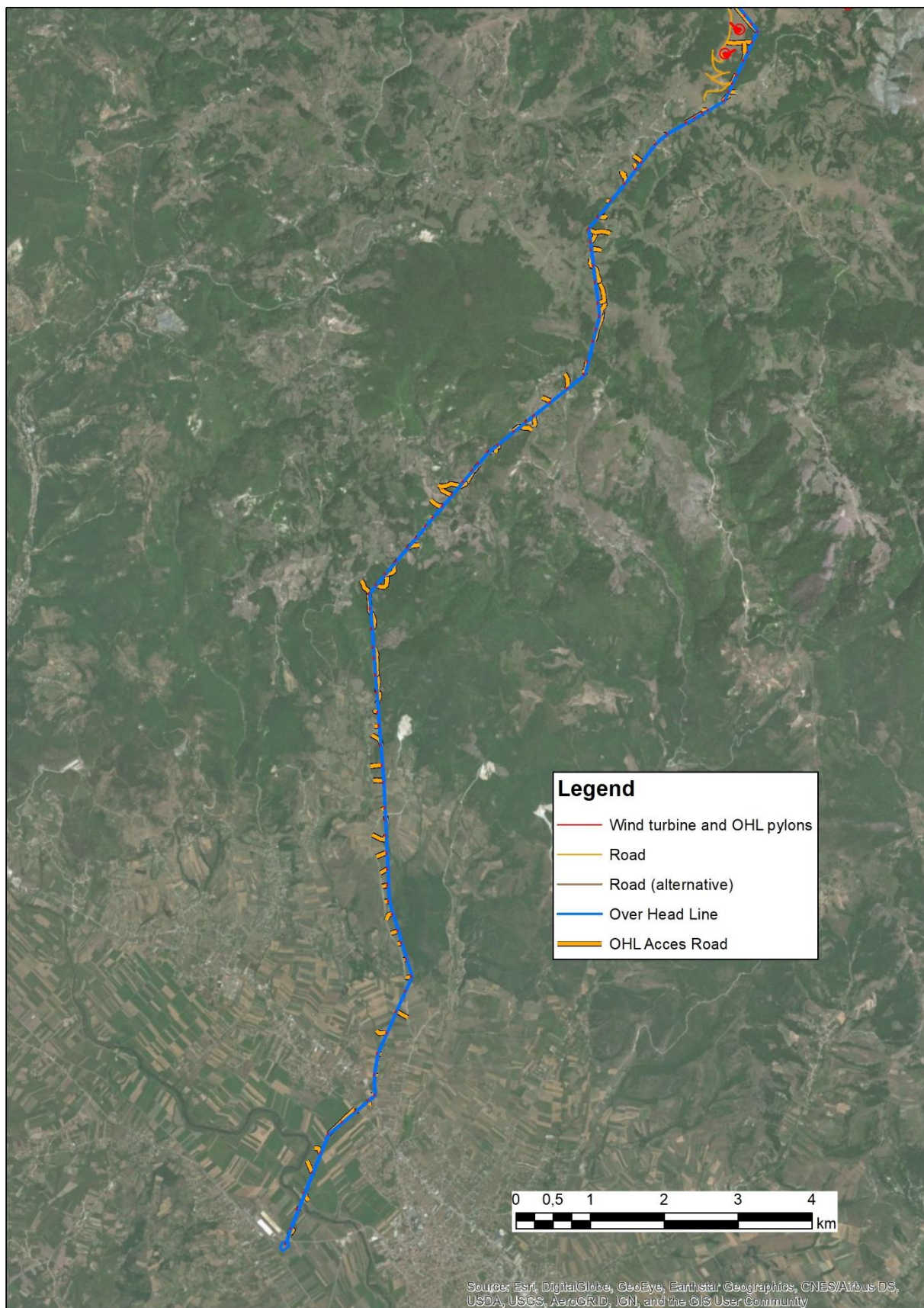


Figure 4: OHL access roads

4.3.3 Storage areas and Deposit areas

The selection of the location of the storage areas and deposit areas and their design has taken into account the following criteria:

- Reduce the distance between these areas and excavation sites;
- Avoid locating these areas on land where forests, water bodies or water springs are present;
- Select areas so to minimize overall visual impacts of the deposits.

4.4 Technological alternatives

The size of wind turbines has been decided to match both the wind resources available and to allow to be transported to the project site on a mountain range without any bigger impacts along the transport route, particularly due to the presence of the tunnel in Stan Terg as a key limiting factor.

Main turbines supplier considered included:

- General Electric (GE 3.8-137 110 m hub height)
- Vestas (V136-4.2 MW, 112m hub Height)
- Senvion (Senvion 4.2M140, 110m hub height).

Other turbine suppliers considered included Enercon, Siemens Gamesa, and Nordex. In terms of environmental impacts (noise, transport, etc.), the various solutions considered did not differ significantly, hence the choice was driven mainly by economic considerations. Special turbulence models have been performed by GE to make sure the turbines are suitable for the mountain area with high winds.

For the transmission line the 110 kV voltage has been chosen as it fits perfectly for the transport of 105MW with a little buffer. Higher voltage (330kV) has been considered economically not feasible and lower voltages would have too high losses and would have need at least a second system (6 more wires).

Due to supply chains the possible selection of OHL pylons is limited in Kosovo. The used lattice pylons are standard models and have been chosen due to load calculations and hilly terrain. Especially possible icing events in the wintertime at the pylons and on the cables have been taken into consideration.



REPORT

Bajgora Wind Project
Environmental and Social Impact Assessment
Section 5 - Methodology

Submitted to:

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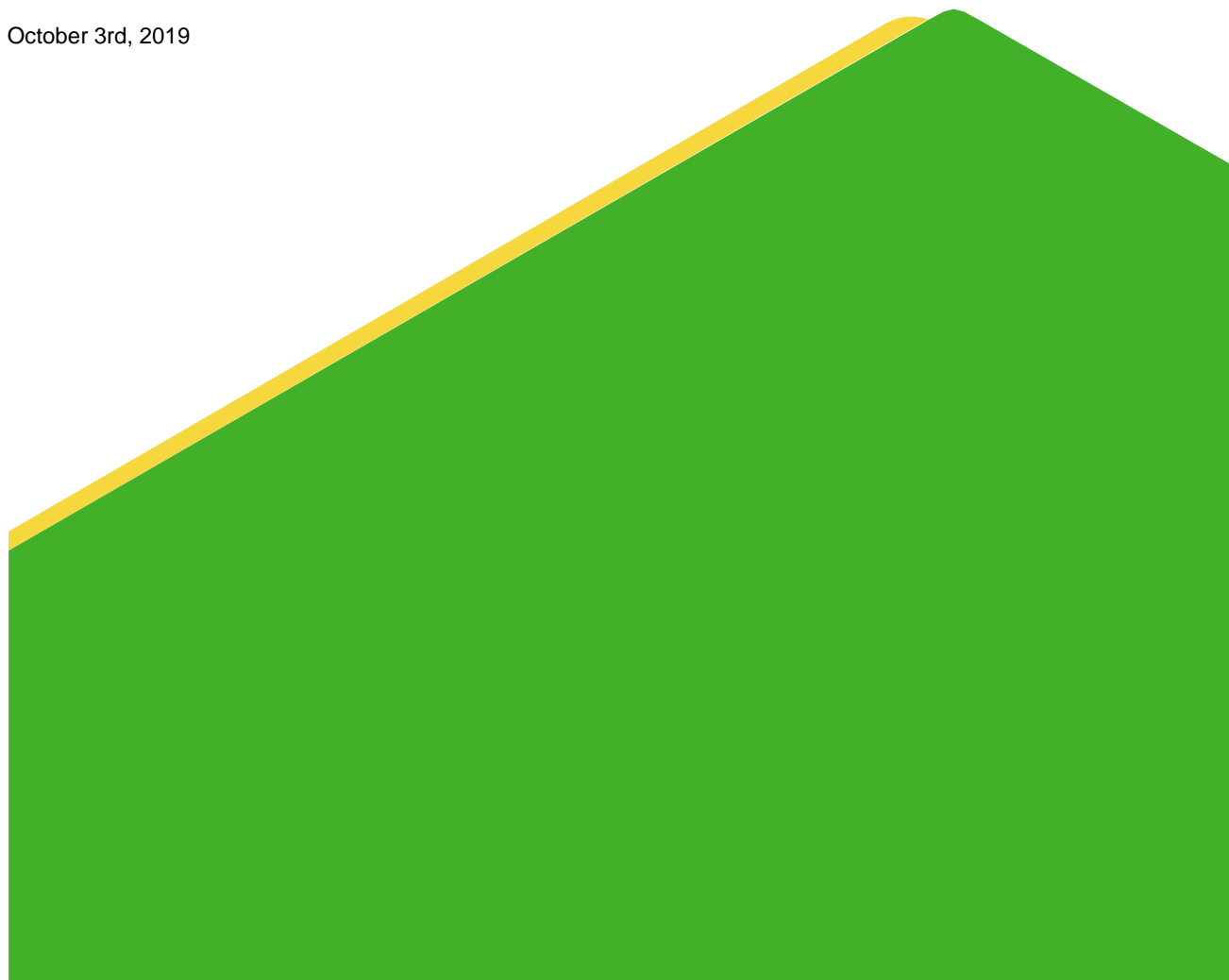


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5.0 IMPACT ASSESSMENT METHODOLOGY

5.1 Introduction

This chapter presents the methodology for the environmental and social impact assessment developed to meet both National and International standards and requirements. The following figure summarizes the phases of the preparation of the ESIA report and the methodology described in this document.

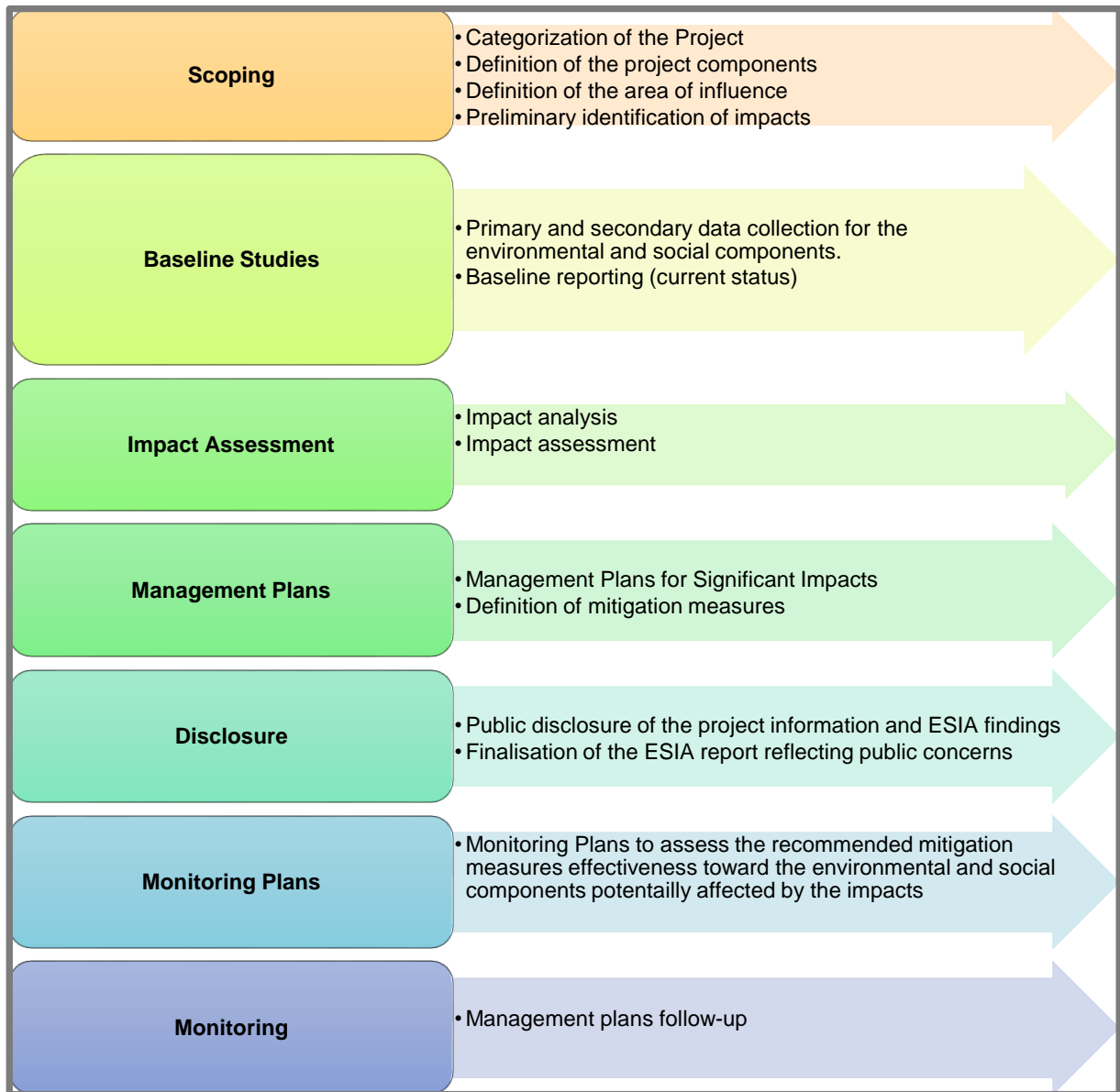


Figure 1 Phases of the ESIA process

The general methodology adopted by Golder for Environmental and Social Impact Assessment Studies has been designed to be analytical and transparent and to allow for a semi-quantitative analysis of the impacts on the various environmental and social components. This methodology is based on the premise that projects can generate both negative and positive impacts whose magnitude that can be evaluated considering the different characteristics of the project activities and of the environmental and social context.

This methodology is based on three main analytical phases, as described below:

■ Phase 1: identification of Project Actions and Impact Factors

- **Project actions:** activities directly or indirectly related to the project that can interfere with the context, generating environmental or social pressures;
- **Impact factors:** direct or indirect interferences generated by the project actions on the context and able to influence the state or quality of one or more environmental and social components;

■ Phase 2: identification of Environmental and Social Components and Sensitivity level allocation

- **Identification of the components potentially subject to interference:** using a specific cross-reference matrix between the impact factors and the project actions, it is the process identifying the components potentially subject to impacts in each phase of the project (for example: construction, operation; decommissioning).
- **Sensitivity of the component:** sum of the conditions characterizing the current quality and/or the dynamics of a specific environmental and social component and/or of its resources;

■ Phase 3: Impact Assessment

- **Impacts:** changes suffered by the environmental and/or social quality status due to the effects caused by the impact factors on the environmental or social components;
- **Mitigation measures:** actions adopted to mitigate negative impacts or to maximize the effects of positive impacts on the environmental and social components.

The three phases are illustrated in the figure below and described in the following paragraphs.

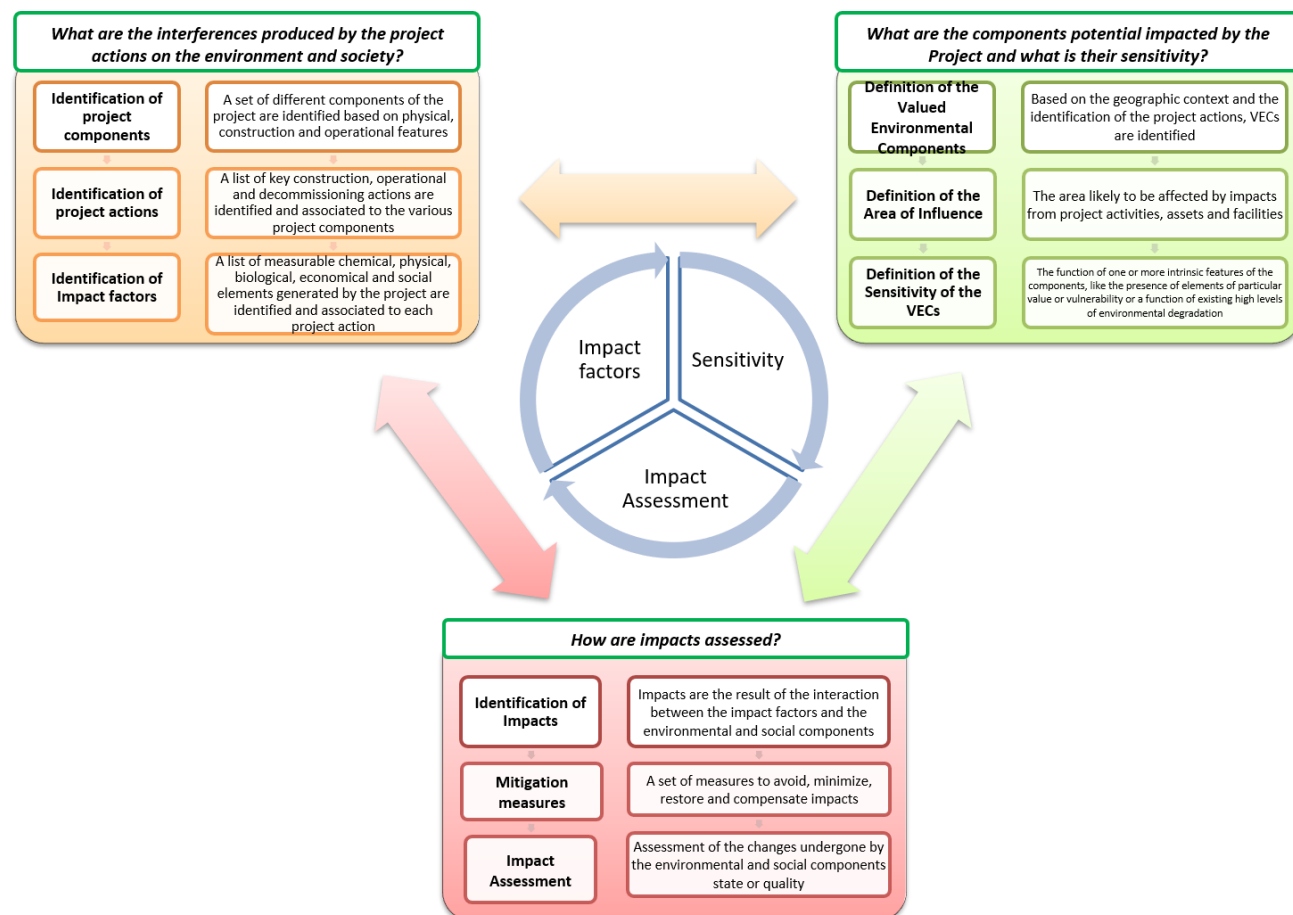


Figure 2: Analytical phases of the Impact Assessment methodology

5.2 Project Area of Influence

Within the present study, for the identification of the Project's Area of Influence, the definition provided by IFC PS is used:

"The area likely to be affected by: (i) the project and the client's activities and facilities that are directly owned, operated or managed (including by contractors) and that are a component of the project; (ii) impacts from unplanned but predictable developments caused by the project that may occur later or at a different location; or (iii) indirect project impacts on biodiversity or on ecosystem services upon which Affected Communities' livelihoods are dependent."

The identification of the Project's Area of Influence varies according to the environmental and social component assessed and is hence clearly defined in section 6 of the study. Within the context of the biodiversity baseline and impact assessment, reference is also made to the Local Study Area and the Regional Study Area, as further described in section 6.2 of the study.

An additional area is the one affected by cumulative impacts¹. This area is generated by the overlap of impacts from other existing and/or approved projects. This area accounts for eventual environmental and/or social critical factors deriving from the natural resources' exploitation and/or highly sensitive areas subject to the project's impacts.

5.3 Phase 1: identification of Project Actions and Impact Factors

5.3.1 Identification of the Project Actions

Project Actions are activities directly or indirectly related to the project which can interfere with the environment as primary generative elements of environmental or social pressures, defined in the context of this methodology as impact factors. The actions derive from the analysis and breakdown of the intervention foreseen to complete the project taking into account the whole project's lifecycle (i.e. design, construction, operation and decommissioning). Examples of Project actions for typical greenfield infrastructure projects include, but are not limited to:

- **Land acquisition:** includes all necessary administrative and field activities that allow the project proponents to enter in possession of the Project areas;
- **Vegetation clearing:** includes removal of natural vegetation, particularly trees and shrubs to allow excavators and dozers to enter the work areas and other project areas;
- **Topsoil/soil removal and storage:** includes stripping of the first layers of vegetated topsoil (including the herbaceous vegetation) for storage on dedicated areas and all actions to prevent soil degradation like water runoff and wind erosion; and
- **Site levelling and grading:** includes excavation and earthwork to generate the surface upon which the project will be constructed. It can include excavation through soft soil, excavation through rocks and excavation through sediments.

5.3.2 Identification of the Impact Factors.

Project Actions can determine **Impact Factors** on the components, intended as potential interferences that can influence, both positively or negatively, directly or indirectly, the environmental and/or social quality.

¹Cumulative impacts are limited to those impacts generally recognized as important based on scientific concerns and/or concerns from Affected Communities. Examples of cumulative impacts include incremental contribution of gaseous emissions to an airshed; reduction of water flows in a watershed due to multiple withdrawals; increases in sediment loads to a watershed; interference with migratory routes or wildlife movement; or more traffic congestion and accidents due to increases in vehicular traffic on community roadways.

The following list presents typical impact factors generated by infrastructure projects:

- Greenhouse gases emissions
- Ozone depleting substances emissions
- Dust and particulate matter emissions
- Gaseous pollutants emissions
- Changes to the local morphology
- Removal of topsoil
- Demand for freshwater
- Demand for potable water
- Discharge of wastewater
- Changes in flow/circulation in natural water bodies
- Changes in sedimentation patterns
- Noise emissions
- Vibration emissions
- Introduction of new buildings/infrastructures
- Removal of buildings/infrastructures
- Demand for waste disposal services
- Demand for industrial materials (sand, gravel, etc.)
- Removal of natural vegetation
- Introduction of alien species
- Change in land use
- Demand for workforce
- Demand for goods, materials and services
- Demand for energy
- Traffic increase
- Interruption/limitation of infrastructures/services
- Influx of workers
- Resettlement of people/businesses
- Site restoration.

The list of impact factors for the project will be verified and modified, if needed, based on the actual project actions that will be identified.

Accident or unplanned events (such as accidental spills/releases of oil/fuel from vehicles), are not considered as impact factor because the potential pollution of environmental components deriving from such events cannot be associated with the ordinary functioning of the site. Such accidents are managed in a specific chapter of the Impact Study.

5.4 Phase 2: Identification of Environmental and Social Components Potentially Subject to Impact and Assignment of the Sensitivity Level

Following the identification of the impact factors generated by the Project, a Project Actions – Impact Factors matrix is prepared. For each phase of the Project the correlation with the Actions and Impact Factors is highlighted in the matrix to identify the list of impact factors generated by each single Project Action.

Based on the Project Actions – Impact Factors matrix, for each project phase tables are generated listing the impact factors from the single phase and the potentially impacted component(s).

Each environmental and social component in the area of influence of the project has a different sensitivity to the impact factors generated by the project or can pose a different level of risk to the project. The sensitivity of an environmental component is typically evaluated on the basis of the presence/absence of some features which define both the current degree of the environmental quality and the susceptibility to environmental changes of the component. As examples, for physical components the sensitivity is typically related to the presence of elements that are at the highest or lowest scale of quality, for biodiversity it is related to the presence of threatened, endemic, or protected species or habitats and for social components to the presence of vulnerable elements of the community like poor, elderly, members of ethnic or religious minorities, indigenous people, etc. The **sensitivity (S)** of the component is defined using component-specific metrics during the baseline and can assume values between 1 and 5 associated to a definition from Low to High. The S value is assigned considering both the component's characteristics and the possible presence of sensitivity features.

The following list presents potential sensitivity features to be considered in defining the sensitivity of typical environmental and social components considered in ESIA studies. The specific metrics and levels of sensitivity for each of the features considered is defined during the baseline studies specific for each project.

Geology and geomorphology:

- Presence of faults: areas with active faults are considered to pose highest risks to the project and hence are considered of higher sensitivity;
- Presence of landslides: areas within the range of landslides are considered to pose highest risks to the project and hence are considered of higher sensitivity;
- Other geohazards: (karst areas, slope erosion, liquefaction, stream channels, etc.). the presence of other geohazards in the project area is considered of higher sensitivity;
- Seismicity: the location of the project in areas classified as at seismic risk is considered of higher sensitivity

Soils:

- Soil agricultural potential: soils with highest agricultural potential according to local or global assessments are attributed a higher sensitivity;
- Soil erosion potential: soils with highest erosion potential according to local or global assessments are attributed a higher sensitivity;

- Soil pollution potential: soils in areas identified and previously used for industrial, mining, or intensive agriculture are attributed a higher sensitivity.

Surface water

- Presence of waterbodies in the project area of influence and level of ecological integrity; the sensitivity increases with the level of ecological integrity;
- Presence of waterbodies in the project area of influence and level of water/sediment pollution; the sensitivity increases in the presence of polluted watercourse;
- Presence of waterbodies and level of tolerance to hydrological changes; the sensitivity is higher for waterbodies with a low level of tolerance for hydrological changes;

Groundwater

- Presence of shallow aquifers; the sensitivity increases with the presence of shallow aquifers that could be more easily exposed to contamination source;
- Productivity of exploited aquifers; aquifers with low productivity might be depleted in case the project entails groundwater abstraction. The sensitivity is higher for aquifer with low productivity;
- Presence and extent of existing groundwater exploitation; the sensitivity is higher for aquifers already exploited;
- Rock permeability; the sensitivity increases in case the subsoil is made of rocks with high permeability.
- Aquifer vulnerability; the sensitivity increases with the vulnerability of the aquifer as determined by accepted methodologies;

Landscape and visual quality:

- Presence and number of settlements/people within the visual zone of visual influence;
- Presence of areas of touristic interest within the visual zone of visual influence;
- Presence of roads and volume of traffic within the visual zone of visual influence;
- Presence of archaeological, cultural, historic areas within the visual zone of visual influence;
- Presence of natural parks protected and classified areas within the visual zone of visual influence.

Climate

- The project area is characterized by an extreme climate (semi-desert, sub-arctic, etc.) and/or by a high frequency of extreme events (tornadoes, floods, droughts, etc.).
- There is evidence of the effects of climate change within the project area of influence.
- The project area has a limited ability to adjust to climate change.

Air quality

- Presence of settlements and population potentially exposed to air emissions from the project; the sensitivity increases with the number of people exposed;
- Presence of vulnerable targets (schools, hospitals, retirement houses, etc.) exposed to air emissions from the project; the sensitivity increases with the number of vulnerable people exposed;

- Air quality levels in the areas affected by the project; the sensitivity increases in areas already polluted and in areas designated for air quality protection;
- Presence of sensitive ecological receptors like protected or classified areas, protected or endangered habitats and species.

Noise and vibration:

- Presence of settlements and population potentially exposed to noise and vibration from the project; the sensitivity increases with the number of people exposed;
- Presence of vulnerable targets (schools, hospitals, retirement houses, etc.) exposed to noise and vibration from the project; the sensitivity increases with the number of vulnerable people exposed;
- Noise and vibration levels and/or sources in the areas affected by the project; the sensitivity increases in areas already experiencing high levels of noise and vibrations and in areas designated for protection from noise and vibrations;
- Presence of sensitive ecological receptors like protected or classified areas, protected or endangered habitats and species.

Flora

- Number of species of flora present in the project area of influence. The sensitivity increases with the number of species present
- Presence of threatened species of flora in the project area of influence as defined by global (IUCN) or national red lists. The sensitivity increases with the number of threatened species present and the threat level.
- Presence of endemic or restricted range species of flora in the project area of influence as defined by global (IUCN) or national red lists. The sensitivity increases with the number of species present and the level of endemism.
- Presence of protected species or species listed in international conventions for the protection of biodiversity. The sensitivity increases with the number of protected/listed species.
- Presence of invasive alien species. The sensitivity is higher in areas with a higher number of invasive alien species present.

Fauna

- Number of species of fauna present in the project area of influence. The sensitivity increases with the number of species present
- Presence of threatened species of fauna in the project area of influence as defined by global (IUCN) or national red lists. The sensitivity increases with the number of threatened species present and the threat level.
- Presence of endemic or restricted range species of fauna in the project area of influence as defined by global (IUCN) or national red lists. The sensitivity increases with the number of species present and the level of endemism.
- Presence of protected species or species listed in international conventions for the protection of biodiversity. The sensitivity increases with the number of protected/listed species.

- Presence of invasive alien species. The sensitivity is higher in areas with a higher number of invasive alien species present.

Habitats

- Presence of natural habitats; the sensitivity increases with the surface of natural habitats present in the project area of influence.
- Presence of threatened or protected habitats; the sensitivity increases with the surface of threatened or protected habitats present in the project area of influence.
- Presence of critical habitats; the sensitivity increases with the surface of critical habitats present in the project area of influence.

Protected areas

- Presence of protected areas; the sensitivity increases with the number, extent and level of protection of protected areas present in the project area of influence.

Economy

- Presence of skilled personnel; positive economic impact due to employment depends on the presence in the local workforce of the skills that are most relevant to the project. The sensitivity is higher for communities with skilled personnel.
- Presence of businesses and economic activities relevant to the project; positive economic impact due to procurement of goods and services depends on the presence of economic activities in the local communities. The sensitivity is higher for communities with a well-structured business community.

Health

- Level of health care available; the project could cause a population influx that can put a strain to existing health services if left unmanaged. The sensitivity is higher in areas with an insufficient level of healthcare available;
- Presence of communicable diseases; the spreading of communicable diseases can be exacerbated by the influx of workers due to the project. The sensitivity is higher in areas affected by a high level of communicable diseases.
- Overall health state of the population; the project might cause increased levels of exposure to environmental health determinants like air pollutants, noise and vibrations, etc. The sensitivity is higher in the presence of existing health issues in the communities potentially affected by the project.
- Presence of existing environmental health determinants. The presence of environmental health determinants like air and water pollution, soil and groundwater contamination are increasing the sensitivity.

Cultural heritage

- Presence of protected or recognized sites of archaeological or cultural value; the sensitivity increases with the number, cultural/scientific value and level of protection of sites potentially affected;
- Presence of sites with a high archaeological potential in the absence of specific site information or appropriate protection mechanisms; the sensitivity increases with the archaeological potential as indicated by relevant experts;

- Presence of intangible cultural values like sacred sites, initiation sites, sites used for cultural events, sites recognized in oral traditions, etc. the sensitivity increase with the number of sites and values as recognized by the local communities.

The component's Sensitivity can vary from low (1) to high (5) according to the following definitions:

- Low (1): the component does not present elements of sensitivity;
- Medium-low (2): the component presents few elements of sensitivity that have limited significance;
- Medium (3): the component presents numerous elements of sensitivity that have limited significance;
- Medium-high (4): the component presents few elements of sensitivity that have high significance;
- High (5): the component presents numerous elements of sensitivity that have high significance.

5.5 Phase 3: Impact Assessment

5.5.1 Scoring of the Impact Factors

The **impact factors** identified during the analysis of the project and through the definition of the project phases and project actions are assessed for their relevance, using a scoring system. The parameters considered to assess the impact factor score are the following:

Duration (D): is the duration of the impact factor. It may vary from short to long according to the following definitions:

- Short: when the duration is shorter than one month;
- Medium-short: when the duration is between one month and six months;
- Medium: when the duration is between six months and two years;
- Medium-long: when the duration is between two and five years;
- Long: when the duration is over five year.

Frequency (F): is the frequency with which the impact factor manifests itself. It may vary from concentrated to continuous according to the following definitions:

- Sporadic, if it consists of a single event;
- Moderately frequent, if it consists of a few events evenly or randomly distributed over time;
- Frequent, if it consists of several events evenly or randomly distributed over time;
- Highly frequent, if it consists of a high number of events evenly or randomly distributed over time;
- Continuous, if the event has no interruption over time.

Geographic extent (G): is the geographical area within which the impact factor can exert its effects. It may vary from project site to transboundary according to the following definitions:

- Project footprint: the impact factor is confined within the facility boundary or exclusively controlled by the project;
- Local: the impact factor extends to the areas or communities neighbouring the project site;
- Regional: the impact factor extends to an area beyond the surroundings of the project site and to regional physical (airshed – watershed, etc.) or administrative boundaries;

- Beyond regional: the impact factor extends throughout several regions or to the entire country;
- Global: the impact factor has an international or global reach.

Intensity (I): is a measure of the physical, economic or social extent of the impact factor. It may vary from negligible to very high according to the following definitions:

- Negligible: the impact factor is generated in amounts that cannot be easily detected or perceived and that are unlikely to cause any detectable change in the target environmental or social components;
- Low: the impact factor is generated in amounts that can be detected or perceived but whose effects are unlikely to cause tangible changes in the target environmental or social components;
- Medium: the impact factor is generated in amounts that are within legal standards or accepted industry practices and/or whose effects are likely to cause tangible changes in the target environmental or social components;
- High: the impact factor is generated in amounts that at the limit of legal standards or accepted industrial practices and/or whose effects are likely to cause serious impairment in the target environmental or social components;
- Very high: the impact factor is generated in amounts that are at risk of exceeding the limits of legal standards or accepted industrial practices and/or whose effects are likely to cause very serious to catastrophic damage to the target environmental or social components.

Each of the parameters listed above can have a value between 1 and 5. The severity of the impact is determined through an **Impact Factor Score** which sums the score of each of the 4 parameters, hence it can assume a value between 5 and 20.

5.5.2 Calculation of the Impact Value

The calculation of the **Impact Value** is done by multiplying the Impact Factor Score for the value of the sensitivity of the target component, determined during the baseline. The result is then weighted considering the impact reversibility.

The reversibility is the property of an impact to reduce its intensity over time and to eventually disappear entirely. Reversibility may vary from reversible to irreversible according to the following definitions:

- Short term: if the initial condition of the component will be restored in a period between weeks and months after the end of the impact factor and/or the restoration activities;
- Short/mid-term: if the initial condition of the component will be restored in a period between a few months and one year after the end of the impact factor and/or the restoration activities;
- Mid-term: if the initial condition of the component will be restored in a period between one year and five years after the end of the impact factor and/or the restoration activities;
- Long term: if the initial condition of the component will be restored in a period between five and 25 years after the end of the impact factor and/or the restoration activities;
- Irreversible: if it is not possible to predict restoration to the initial conditions.

The reversibility is measured on a scale between 1 and 5.

The **Impact Value (IV)** is calculated by multiplying the Impact Factor Score with the component's Sensitivity level and with the Reversibility, according to the following formula: $IV = IFS \times S \times R$

5.5.3 Calculation of the Residual Impact

The next step consists in assessing the mitigation measures effectiveness to reduce or eliminate the negative impact (or to maximize the positive one). The mitigation measures should be defined with reference to the mitigation hierarchy listed below in descending order of effectiveness:

- Avoid
- Minimize
- Restore
- Compensate

The effectiveness of the mitigation measures defined in the environmental and social management plan is assessed using expert judgement and the outcomes from previous applications of similar mitigation measures to similar projects. The definitions of the mitigation effectiveness may vary from none to high, as described below:

- None: the measures can reduce the impacts by less than 20% of the expected outcome;
- Low: the measures can reduce the impacts by 20% - 40% of the expected outcome;
- Medium: the measures can reduce the impacts by 40% - 60% of the expected outcome;
- Medium-high: the measures can reduce the impacts by 60% - 80% of the expected outcome;
- High: the measures can reduce the impacts by more than 80% of the expected outcome.

The Mitigation effectiveness is measured on a scale from 1 to 0.2 (1 = minimum effectiveness; 0.2 = maximum effectiveness).

Positive impacts are typically associated with economic and social opportunities and sometimes with environmental aspects a project can solve (for example: a project located in a brownfield where existing environmental issues can be addressed). Projects are typically promoting activities to enhance the economic, social and environmental opportunities through specific programs, plans and measures including, for example, professional skills generation, community investment, shared value programs, remediation programs, biodiversity conservation projects, etc.

The assessment of positive impacts is based on the same parameters used to assess the negative ones. The only difference is that the mitigation measures are replaced by enhancement measures, or measures to maximize the potential positive impacts.

The enhancement measures effectiveness defined in the environmental and social management plan is assessed using expert judgement and the outcomes of previous application of similar enhancement measures to similar projects. The definitions of the enhancement effectiveness may vary from none to high as shown below:

- None: the measures can enhance the positive impacts by less than 10% of the expected outcome;
- Low: the measures can enhance the positive impacts by 10% - 20% of the expected outcome;
- Medium: the measures can enhance the positive impacts by 20% - 30% of the expected outcome;
- Medium high: the measures can enhance the positive the impacts by 30% - 40% of the expected outcome;
- High: the measures can enhance the positive impacts by more than 40% of the expected outcome.

The Residual Impact Value (RIV) is calculated multiplying the impact value with the impact mitigation effectiveness as per the following formula: $RIV = IV \times M$

5.5.4 Scale of Residual Impacts

The scale of the residual impact resulting from the calculation described above ranges from 0.8 to 500. The impact value is then scaled to 5 levels by dividing into 5 classes with an equal number of values, the entire distribution of values obtained.

The residual negative impacts are classified into 5 levels according to the table below:

| Residual impact score | Residual impact definition | |
|-----------------------|----------------------------|--|
| 0.8 – 33.0 | Negligible | |
| 33.1 – 76.0 | Low | |
| 76.1 – 136.0 | Medium | |
| 136.1 – 228.0 | High | |
| 228.1 – 500.0 | Very High | |

The residual positive impacts are classified into 5 levels according to the table below:

| Residual impact score | Residual impact definition | |
|-----------------------|----------------------------|--|
| 0.8 – 33.0 | Negligible | |
| 33.1 – 76.0 | Low | |
| 76.1 - 136.0 | Medium | |
| 136.1 - 228.0 | High | |
| 228.1 – 500.0 | Very High | |

5.5.5 Overall assessment

The methodology described above allows for an analytical assessment of impacts caused by individual impact factors over individual components. The process therefore ends with a table presenting several impacts from different impact factors for each component.

The table defines the assessment of the component's overall impact. It is a synthesis of the impacts on a component from all the impact factors generated by the project actions. The impact assessment provides a comprehensive view of the impact value that actually affects the environmental or social component.

The impact assessment is expressed based on the assessor's experience, assigning higher weight to the values less favourable to the component's protection, in order to guide the assessment toward a more prudent approach.

Impacts are presented in separate tables for negative and positive impacts to avoid automatic trade-offs and/or mediating between positive and negative aspects, as they are often targeting different sections of the community.

5.6 Cumulative Impact Assessment

IFC Performance Standard 1 (2012) and another recent publication by IFC (Good Practice Handbook on Cumulative Impact Assessment and Management, August 2013) require that the ESIA includes a cumulative impact assessment (CIA), i.e. "*cumulative impacts that result from the incremental impact, on areas or resources*

used or directly impacted by the project, from other existing, planned or reasonably defined developments at the time the risks and impacts identification process is conducted”.

Those guidelines denote that the scope of the cumulative impact assessment should be commensurate with the extent of cumulative impacts anticipated. This gives good direction to produce a focused assessment, considering only relevant disciplines. Cumulative impacts are limited to those impacts generally recognized as important on the basis of scientific concerns and/or concerns from Affected Communities².

Good Practice Handbook proposes as a useful preliminary approach for developers in emerging markets the conduct of a rapid cumulative impact assessment (RCIA) which is illustrated below.

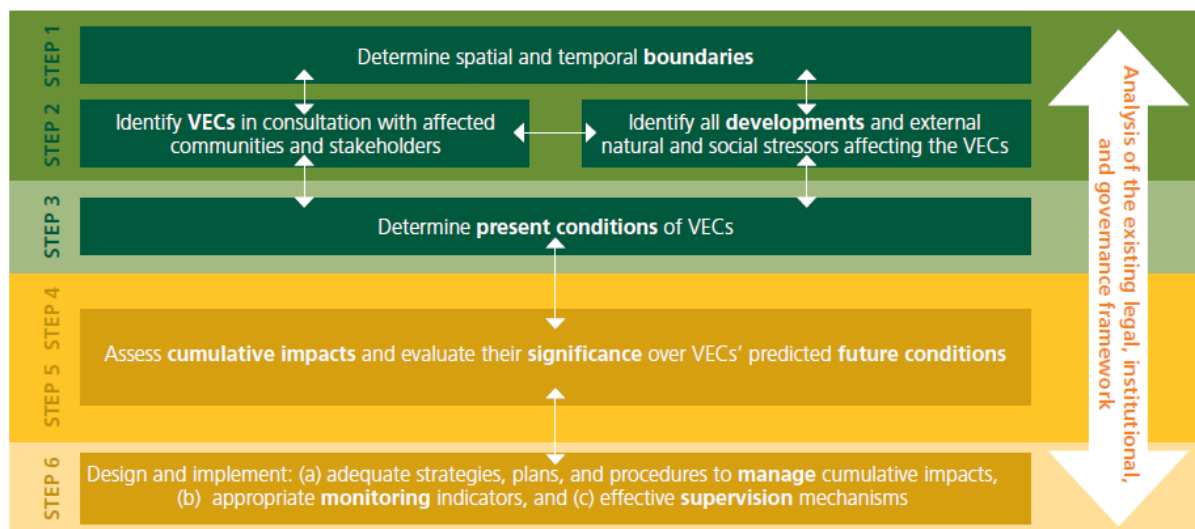


Figure 3. RCIA: Six-Step Approach

5.7 Transboundary Impact Assessment

The transboundary impact assessment will address issues that may have impacts that could potentially cross the territorial boundaries of Kosovo into neighbouring countries. This assessment is discussed in the context of the Convention on Environmental Impact Assessment in a Transboundary Context 1991 (the Espoo Convention).

Under the terms of the Espoo Convention on Environmental Assessment, a transboundary impact is defined as *"any impact not exclusively of a global nature, within an area under the jurisdiction of a Party caused by a proposed activity the physical origin of which is situated wholly or in part within the area under the jurisdiction of another party"*. Equally IFC Performance Standard 1 (2012 – GN36) defines transboundary impacts as *"impacts that extend to multiple countries, beyond the host country of the project but are not global in nature"*.

The Bajgora wind farm is located far from any international borders and given the nature of the Project no transboundary impacts or risks were identified.

5.8 Environmental and Social Management Plan

An Environmental and Social Management Plan (ESMP) is prepared for the Project ensuring;

² Examples of cumulative impacts include: incremental contribution of gaseous emissions to an airshed; reduction of water flows in a watershed due to multiple withdrawals; increases in sediment loads to a watershed; interference with migratory routes or wildlife movement; or more traffic congestion and accidents due to increases in vehicular traffic on community roadways.

- the execution of the Project in compliance with the commitments addressed in the ESIA for the minimization of significant and potential environmental and social impacts;
- compliance with all applicable Project Standards as well as relevant IFI guidelines provided in the ESIA;

This ESMP presented in the ESIA is prepared to describe the available systems in place and the initially developed mitigation measures for ensuring the environmental and social performance anticipated in the ESIA. This ESMP will need to be extended to include specific plans and procedures developed by the Project proponent.

This ESMP includes an outline of the system for implementation and monitoring of the effectiveness of the suggested mitigation measures.

The ESMP will need to include three components:

- Environmental Management Plan
- Labour, Health and Safety Management Plan
- Social Management Plan

The plans are further separated into the section for the construction, operation and closure phases of the Project life, including required mitigations as well as monitoring to evaluate the performance.

- The detailed plans and procedures as part of the ESMS should include the following sections:
 - Communication Procedure
 - Organizational Structure (job descriptions, knowledge, skills, and experience in detail)
 - Human Resources and Labour Procedure and Plan
 - Competence, Training and Awareness Plan/Procedure
 - Resource Management Plan/Training Management Plan
 - Contractor, Supply Chain Management and Procurement Plan
 - Security Management Plan
 - Community Health and Safety Management Plan
 - Traffic Management Plan
 - Camp Site Management Plan
 - Pollution Prevention Plans
 - Biodiversity Management Plan (BMP)
 - Environmental Impact Assessment Procedure
 - Occupational Health and Safety (OHS) Management Plan
 - OHS Risk Assessment Procedure
 - Incident Reporting and Investigating Procedure
 - Emergency Preparedness and Response Management Plan
 - A Cultural Heritage Management Plan (includes Archaeological Chance Find Procedure)

- Visual Impacts Management Plan
- Internal Auditing Procedure
- Performance Measurement and Monitoring Procedure
- The Project needs to develop and maintain an active **stakeholder engagement process and grievance mechanism**.
- Resettlement Action Plan, including details on management of livelihood restoration

The ESMP included here is intended to describe the framework for the general management issues. This ESMP will be further developed as the project progresses.

5.9 Stakeholder Engagement

Stakeholder engagement is an ongoing process that extends throughout the lifespan of the Project and encompasses a range of approaches and activities, from information sharing and consultation, to participation, negotiation and partnership. In order to successfully engage with different groups of stakeholders, thorough analysis and prioritizing should be carried out to identify the most appropriate methods and strategies to be employed. To ensure that the engagement process is executed on a continuous and ongoing basis; the stakeholder engagement plan will be revised and updated to reflect the feedback from all engaged parties and latest project conditions.

During the course of the ESIA process a separate Stakeholder Engagement Plan for the construction and operation phase is prepared for the Project with the following general principles that will govern the engagement activities:

Capacity building and consultation: in order to facilitate meaningful participation of stakeholders, activities aimed at education, capacity building, exchange of information and consultation will be carried out:

- The content of documents for public comment will provide accessible and adequate information on the Project, and not create undue fears (i.e. potential adverse impacts) or expectations (i.e. potential beneficial impacts such as job creation, etc.);
- Written information will be accompanied by visual illustrations and explanations, as needed, to build understanding of the project;
- The stakeholders' language of choice will be used during meetings, with translation where required;
- If key issues of particular concern will arise, workshops may be offered to explain technical processes, assessment techniques, and quality assurance measures to verify results to ensure that mitigation procedures are followed;
- Efforts will be made to explain not only the proposed project and ESIA process, but also applicable national laws and regulations, international standards and how the Project will address compliance; and
- Communities will be given the opportunity to express their views on Project risks, impacts and mitigation measures, in a two-way process in which the Project will play a proactive role.

Provision for the participation of vulnerable groups: Vulnerable groups may be defined as people that by virtue of gender, ethnicity, age, physical or mental disability, economic disadvantage or social status may experience different or unique effects from the Project than others.

The following measures will be implemented to enhance the ability of vulnerable stakeholder groups to participate meaningfully in the ESIA process:

- During the continued process of stakeholder identification, the Project will continuously identify disadvantaged or vulnerable persons our groups and staff will identify engagement approaches and activities that will support effective engagement of vulnerable persons.
- The Project will make sure the general public is aware of the disclosed project information by arranging transportation support to the villagers to the consultation meetings.
- The Project will organize dedicated meetings at the villages to disclose the project information and relevant grievance mechanism.

5.10 Bajgora Wind Project: Identification of Project Actions, Impact Factors and Environmental and Social Components Potentially Subject to Impact

In order to define the baseline scenario considering all the potentially impacted environmental and social components, a preliminary verification of the potential impacts was carried out, identifying the project actions able to interfere with the environmental components during construction, operational and decommissioning phases (such as described in the chapter above).

The definition of the aforementioned phases of the Project, and their respective duration, was carried out taking into account the entire life cycle of the project which will have the following duration:

- Construction phase: 1,5 years
- Operational phase: 25 years
- Decommissioning phase: 0,5 year.

The project actions able to interfere with the environmental components have been identified starting from the activities foreseen by the Project and described in chapter 3.0. Table 1 lists the project actions for each phase.

Table 1: Project Actions

| Construction Phase |
|---|
| Land acquisition |
| Mobilization of vehicles, workers and equipment, transport of materials and waste |
| Vegetation clearance |
| Surface levelling and grading |
| Blasting |
| Temporary stockpiling of material |
| Construction of deposit areas |
| Construction of the wind turbine foundations |
| Construction of the wind turbines |
| Construction of OHL pylon foundations |
| Construction of the OHL pylons |
| Waste management |

| |
|---|
| Construction Phase |
| Environmental reinstatement of the construction areas |
| Operational Phase |
| Operation and maintenance of the WF |
| Operation and maintenance of the OHL |
| Presence of deposit areas |
| Decommissioning Phase |
| Mobilization of vehicles, personnel and equipment, transport of dismantled material |
| Demolition/dismantling activities |
| Disposal of waste deriving from dismantling/demolition |
| Environmental restoration of the project areas and construction site |

For each of the project actions, the potential impact factors acting on each environmental and social component during construction, operational and decommissioning phase have been identified.

It should be noted that in the identification of the potential impact factors connected to the project actions, those connected to the accidental events covered in a specific paragraph in Chapter 7 have not been considered.

Table 2 shows a matrix highlighting the correlation between project actions and impact factors. The grey cells indicate the presence of potential correlation, the white cells the absence of correlation.

Based on the correlation between project actions vs impact factors, a matrix impact factors vs environmental and social components has been compiled for each project phase, highlighting the correlation between these elements. The grey cells indicate the presence of potential impacts, the white ones the absence of potential impacts.

Table 2: Matrix Project Actions vs Impact Factors

| Impact factor | | Project | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------------|---|------------------------------|-------------------------------|-------------------------|---|--------------------------------|----------------------------------|--------------------------------|--|--------------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------------|-------------------|---|------------------------------------|-----------------------|----------------------------------|----------------------|--|----------------------|--------------------------------------|---------------------|---|-------------------|--|--|
| | | Emission of greenhouse gases | Changing in Climatic patterns | GHG emissions avoidance | Emission of dust and particulate matter | Emission of gaseous pollutants | Emission of noise and vibrations | Change in the local morphology | Removal/degradation of soil and vegetation | Emission of pollutants in freshwater | Change in the local hydrology | Landscape features alteration | Introduction of alien species | Vegetation and top soil restoration | Emission of light | Presence of new buildings/infrastructures | Demand for waste disposal services | Demand for freshwater | Change in land use and ownership | Demand for workforce | Demand for goods, materials and services | Production of energy | Generation of electromagnetic fields | Increase of traffic | Interruption/limitation of infrastructures/services | Influx of workers | Damage and destruction of cultural resources | |
| Actions | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Construction phase | Land acquisition | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Mobilization of vehicles, workers and equipment, transport of materials and waste | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Vegetation clearance | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Surface levelling and grading | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Blasting | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Temporary stockpiling of material | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Construction of deposit areas | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Construction of the wind turbine foundations | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Construction of the wind turbines | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Construction of OHL pylon foundations | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Construction of the OHL pylons | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Waste management | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Environmental reinstatement of the construction areas | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Operational phase | Operation and maintenance of the WF | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Operation and maintenance of the OHL | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Presence of deposit areas | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Decommissioning phase | Mobilization of vehicles, personnel and equipment, transport of dismantled material | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Demolition/dismantling activities | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Disposal of waste deriving from dismantling/demolition | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Environmental restoration of the project areas and construction site | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 3: Impact Factors vs Environmental and Social Components – Construction Phase

| Environmental and Social Component Factors | | Physical environment | | | | | | | Biological environment | | | | | Socio-economic environment | | | | | | | | | |
|---|--|------------------------------|------------------------|-------------------|-----------------------------|---------|-------------|---------------------|------------------------|---------------|--------------------|--------------------|----------------------|------------------------------------|-----------|------------------------|---------------------------------------|----------------------------|-----------------------------|--------------------|-----------------------------------|------------------------------|--|
| | | Geomorphology and topography | Geology and seismicity | Soil and land use | Hydrology and surface water | Climate | Air quality | Noise and vibration | Habitats WF | Habitats OHTL | PBF and CH - Flora | PBF and CH - Fauna | PBF and CH - habitat | Economy, employment and livelihood | Education | Land use and ownership | Community health, safety and security | Transportation and traffic | Housing and Infrastructures | Ecosystem services | Cultural Heritage and Archaeology | Landscape and visual quality | |
| Emission of greenhouse gases | | | | | | | | | | | | | | | | | | | | | | | |
| Changing in climatic patterns | | | | | | | | | | | | | | | | | | | | | | | |
| GHG emissions avoidance | | | | | | | | | | | | | | | | | | | | | | | |
| Emission of dust and particulate matter | | | | | | | | | | | | | | | | | | | | | | | |
| Emission of gaseous pollutants | | | | | | | | | | | | | | | | | | | | | | | |
| Emission of noise and vibrations | | | | | | | | | | | | | | | | | | | | | | | |
| Change in the local morphology | | | | | | | | | | | | | | | | | | | | | | | |
| Removal/degradation of soil and vegetation | | | | | | | | | | | | | | | | | | | | | | | |
| Change in the local hydrology | | | | | | | | | | | | | | | | | | | | | | | |
| Landscape features alteration | | | | | | | | | | | | | | | | | | | | | | | |
| Introduction of alien species | | | | | | | | | | | | | | | | | | | | | | | |
| Vegetation and top soil restoration | | | | | | | | | | | | | | | | | | | | | | | |
| Emission of light | | | | | | | | | | | | | | | | | | | | | | | |
| Presence of new buildings/infrastructures | | | | | | | | | | | | | | | | | | | | | | | |
| Demand for waste disposal services | | | | | | | | | | | | | | | | | | | | | | | |
| Demand for freshwater | | | | | | | | | | | | | | | | | | | | | | | |
| Change in land use and ownership | | | | | | | | | | | | | | | | | | | | | | | |
| Demand for workforce | | | | | | | | | | | | | | | | | | | | | | | |
| Demand for goods, materials and services | | | | | | | | | | | | | | | | | | | | | | | |
| Production of energy | | | | | | | | | | | | | | | | | | | | | | | |
| Generation of electromagnetic fields | | | | | | | | | | | | | | | | | | | | | | | |
| Increase of traffic | | | | | | | | | | | | | | | | | | | | | | | |
| Interruption/limitation of infrastructures/services | | | | | | | | | | | | | | | | | | | | | | | |
| Influx of workers | | | | | | | | | | | | | | | | | | | | | | | |
| Damage and destruction of cultural resources | | | | | | | | | | | | | | | | | | | | | | | |

Table 4: Impact Factors vs Environmental and Social Components – Operational Phase

| Environmental and Social Component Factors | | Physical environment | | | | | | Biological environment | | | | | Socio-economic environment | | | | | | | | | |
|---|--|------------------------------|------------------------|-------------------|-----------------------------|---------|-------------|------------------------|-------------|---------------|--------------------|--------------------|----------------------------|------------------------------------|-----------|------------------------|---------------------------------------|----------------------------|-----------------------------|--------------------|-----------------------------------|------------------------------|
| | | Geomorphology and topography | Geology and seismicity | Soil and land use | Hydrology and surface water | Climate | Air quality | Noise and vibration | Habitats WF | Habitats OHTL | PBF and CH - Flora | PBF and CH - Fauna | PBF and CH - habitat | Economy, employment and livelihood | Education | Land use and ownership | Community health, safety and security | Transportation and traffic | Housing and Infrastructures | Ecosystem services | Cultural Heritage and Archaeology | Landscape and visual quality |
| Emission of greenhouse gases | | | | | | | | | | | | | | | | | | | | | | |
| Changing in climatic patterns | | | | | | | | | | | | | | | | | | | | | | |
| GHG emissions avoidance | | | | | | | | | | | | | | | | | | | | | | |
| Emission of dust and particulate matter | | | | | | | | | | | | | | | | | | | | | | |
| Emission of gaseous pollutants | | | | | | | | | | | | | | | | | | | | | | |
| Emission of noise and vibrations | | | | | | | | | | | | | | | | | | | | | | |
| Change in the local morphology | | | | | | | | | | | | | | | | | | | | | | |
| Removal/degradation of soil and vegetation | | | | | | | | | | | | | | | | | | | | | | |
| Change in the local hydrology | | | | | | | | | | | | | | | | | | | | | | |
| Landscape features alteration | | | | | | | | | | | | | | | | | | | | | | |
| Introduction of alien species | | | | | | | | | | | | | | | | | | | | | | |
| Vegetation and top soil restoration | | | | | | | | | | | | | | | | | | | | | | |
| Emission of light | | | | | | | | | | | | | | | | | | | | | | |
| Presence of new buildings/infrastructures | | | | | | | | | | | | | | | | | | | | | | |
| Demand for waste disposal services | | | | | | | | | | | | | | | | | | | | | | |
| Demand for freshwater | | | | | | | | | | | | | | | | | | | | | | |
| Change in land use and ownership | | | | | | | | | | | | | | | | | | | | | | |
| Demand for workforce | | | | | | | | | | | | | | | | | | | | | | |
| Demand for goods, materials and services | | | | | | | | | | | | | | | | | | | | | | |
| Production of energy | | | | | | | | | | | | | | | | | | | | | | |
| Generation of electromagnetic fields | | | | | | | | | | | | | | | | | | | | | | |
| Increase of traffic | | | | | | | | | | | | | | | | | | | | | | |
| Interruption/limitation of infrastructures/services | | | | | | | | | | | | | | | | | | | | | | |
| Influx of workers | | | | | | | | | | | | | | | | | | | | | | |
| Damage and destruction of cultural resources | | | | | | | | | | | | | | | | | | | | | | |

Table 5: Impact Factors vs Environmental and Social Components – Decommissioning Phase

| Environmental and Social Component | Physical environment | | | | | | | Biological environment | | | | | Socio-economic environment | | | | | | | | | |
|---|------------------------------|------------------------|-------------------|-----------------------------|---------|-------------|---------------------|------------------------|---------------|--------------------|--------------------|----------------------|------------------------------------|-----------|------------------------|------------------------------|----------------------------|-----------------------------|--------------------|-----------------------------------|------------------------------|--|
| | Geomorphology and topography | Geology and seismicity | Soil and land use | Hydrology and surface water | Climate | Air quality | Noise and vibration | Habitats WF | Habitats OHTL | PBF and CH - Flora | PBF and CH - Fauna | PBF and CH - habitat | Economy, employment and livelihood | Education | Land use and ownership | Community health, safety and | Transportation and traffic | Housing and Infrastructures | Ecosystem services | Cultural Heritage and Archaeology | Landscape and visual quality | |
| Factors | Impact | | | | | | | | | | | | | | | | | | | | | |
| Emission of greenhouse gases | | | | | | | | | | | | | | | | | | | | | | |
| Changing in climatic patterns | | | | | | | | | | | | | | | | | | | | | | |
| GHG emissions avoidance | | | | | | | | | | | | | | | | | | | | | | |
| Emission of dust and particulate matter | | | | | | | | | | | | | | | | | | | | | | |
| Emission of gaseous pollutants | | | | | | | | | | | | | | | | | | | | | | |
| Emission of noise and vibrations | | | | | | | | | | | | | | | | | | | | | | |
| Change in the local morphology | | | | | | | | | | | | | | | | | | | | | | |
| Removal/degradation of soil and vegetation | | | | | | | | | | | | | | | | | | | | | | |
| Change in the local hydrology | | | | | | | | | | | | | | | | | | | | | | |
| Landscape features alteration | | | | | | | | | | | | | | | | | | | | | | |
| Introduction of alien species | | | | | | | | | | | | | | | | | | | | | | |
| Vegetation and top soil restoration | | | | | | | | | | | | | | | | | | | | | | |
| Emission of light | | | | | | | | | | | | | | | | | | | | | | |
| Presence of new buildings/infrastructures | | | | | | | | | | | | | | | | | | | | | | |
| Demand for waste disposal services | | | | | | | | | | | | | | | | | | | | | | |
| Demand for freshwater | | | | | | | | | | | | | | | | | | | | | | |
| Change in land use and ownership | | | | | | | | | | | | | | | | | | | | | | |
| Demand for workforce | | | | | | | | | | | | | | | | | | | | | | |
| Demand for goods, materials and services | | | | | | | | | | | | | | | | | | | | | | |
| Production of energy | | | | | | | | | | | | | | | | | | | | | | |
| Generation of electromagnetic fields | | | | | | | | | | | | | | | | | | | | | | |
| Increase of traffic | | | | | | | | | | | | | | | | | | | | | | |
| Interruption/limitation of infrastructures/services | | | | | | | | | | | | | | | | | | | | | | |
| Influx of workers | | | | | | | | | | | | | | | | | | | | | | |
| Damage and destruction of cultural resources | | | | | | | | | | | | | | | | | | | | | | |



REPORT

Bajgora Wind Project
Environmental and Social Impact Assessment
Section 6.A - Physical Baseline

Submitted to:

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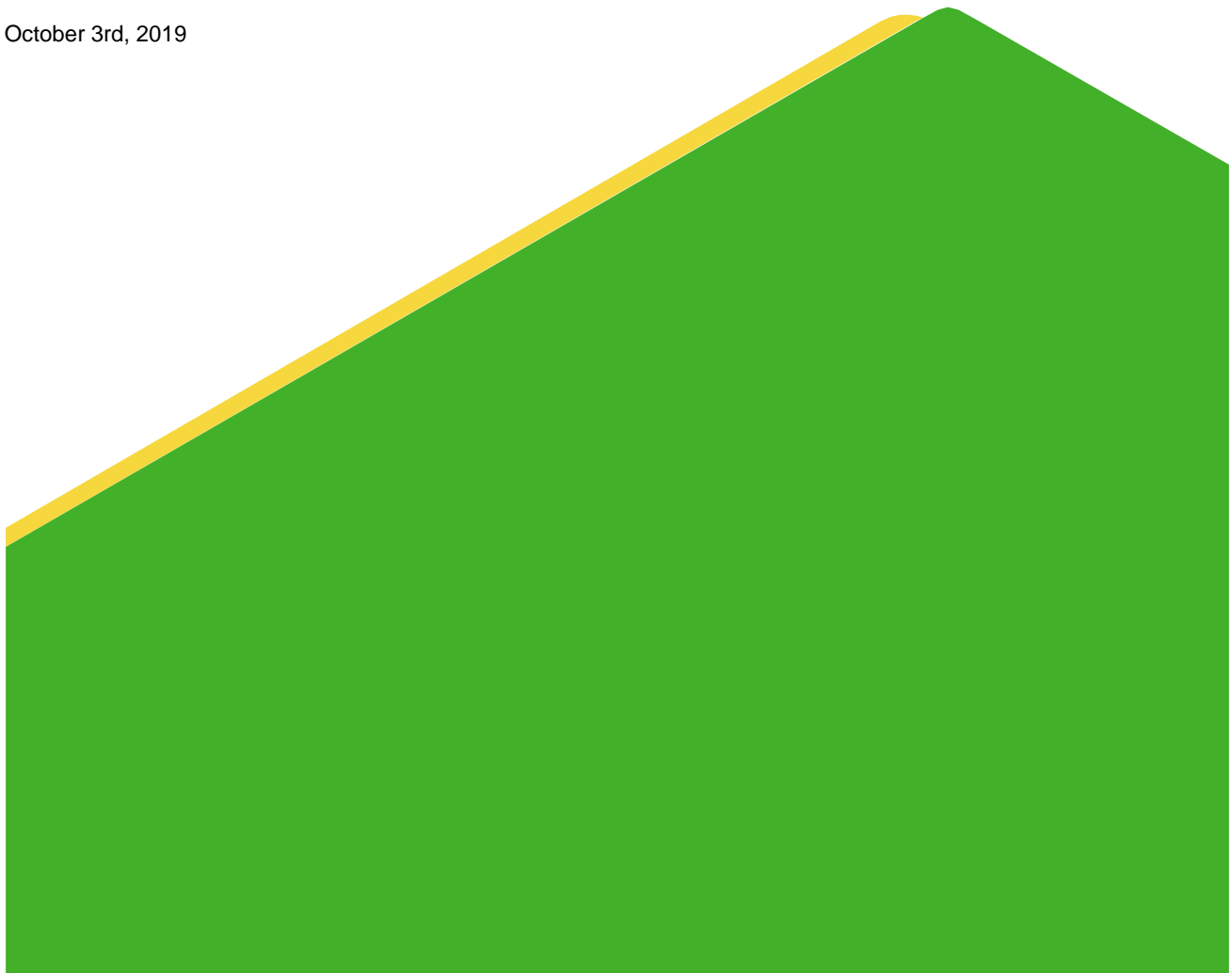


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APPENDICES

Appendix A – Thematic Maps

6.0 A - PHYSICAL COMPONENTS BASELINE

6.1 Identification of the area of influence

With regard to the baseline of main physical components: geomorphology, geology, hydrogeology, land use and soil, the adopted area of influence (Aoi) of the project is represented by a 2.5 km wide buffer around the Selac wind farm areas and the OHL. A narrow 300 m wide buffer has been considered to evaluate the presence of springs and wells in the proximity of the project areas. The extension of above-mentioned buffers (2.5 km and 300 m) is the same adopted in the local OHL EIA study. It has been considered appropriate to represent the project area of influence on physical components.

The outline of the Aol is represented in **Figure 1** and **Figure A.1** (Appendix A).

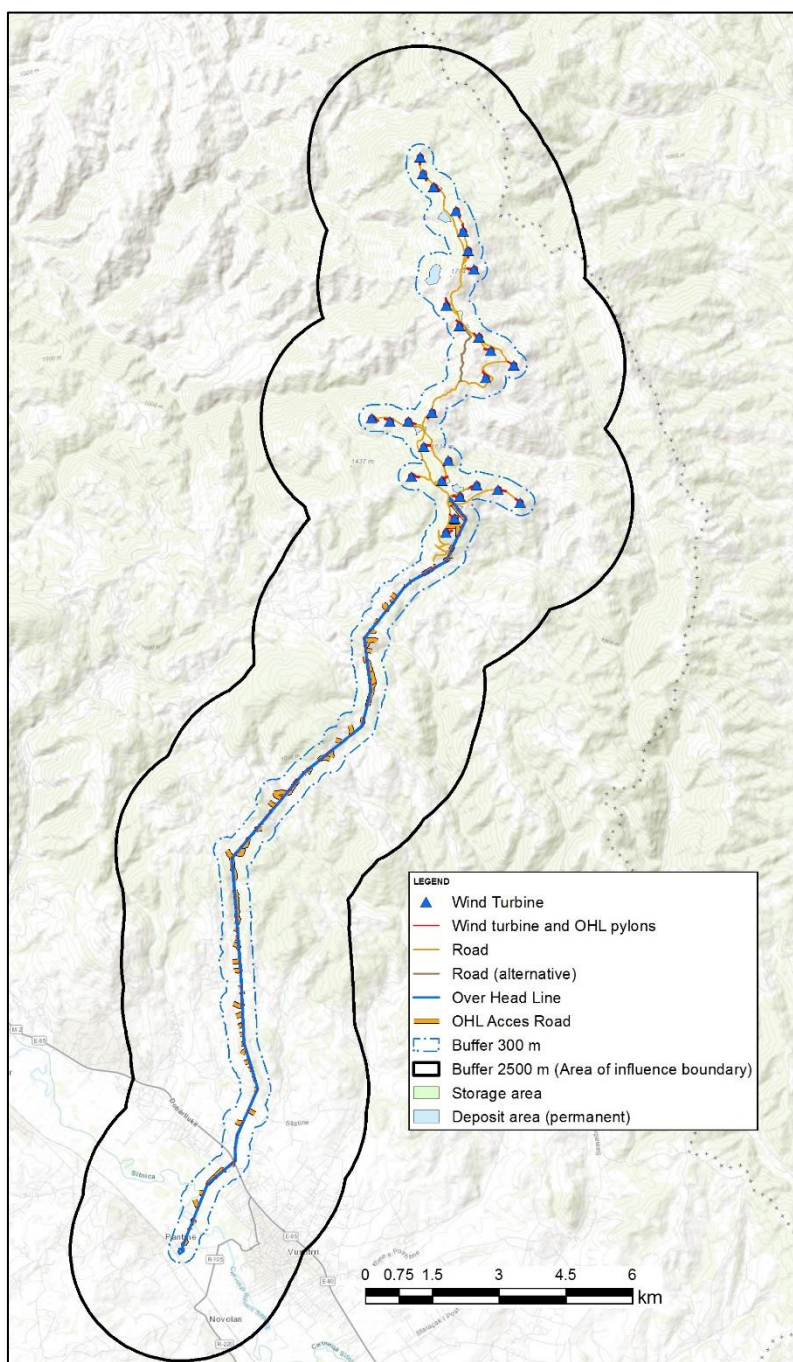


Figure 1: Outline of the Area of influence adopted for the baseline of physical components

6.2 Natural hazards in the Project area

Project area extends across different types of geographic environments. The Wind Farm area is located in a mountainous environment, while OHL extends from mountain to hill and river plain areas.

The mountainous environment that is characterized by natural phenomena that can represent a significant natural hazard in presence of human activity. Here follows a list of hazards potentially affecting workers' safety in the Wind Farm area and in the northern part of OHL:

- snow: heavy snowfall phenomena may affect the accessibility of roads and work areas and may also reduce visibility during snowfall events;
- rapid weather changes: these phenomena may lead to the formation of fog and low clouds that can strongly affect visibility. Intense meteoric phenomena may both reduce visibility and affect road safety. Rapid weather changes may also cause strong variation of temperature, strong winds may lead to a significant decrease of perceived temperature, by means of "windchill" effect;
- storms and lightnings during storm events in mountainous areas, especially in case of low clouds, lightnings may frequently strike objects representing a potential "charged tip", such as power lines and pylons, trees, isolated rocks and peaks, vehicles and other metallic objects.
- wildfire: uncontrolled fire in mountain area may entail different kind of risks ranging from property damage to threat to personal safety. Other collateral hazards related to wildfire are visibility reduction, road disruption and airborne air pollutants (e.g. smoke, carbon monoxide).

In the hill and river plain environments along the OHL natural hazards related to meteoric events and weather change are much milder than in the mountainous environment. Nevertheless, significant hazards may be represented by intense meteoric events and wildfires, especially with regards to visibility reduction and road disruption.

Above mentioned natural hazards are typical of mountain areas and shall be addressed by health & safety plans and procedures for any kind of work in this type of environment.

6.2.1 Snow related hazards

Snow related natural hazards, such as avalanches, may be relevant in mountain areas; in the Wind Farm area they represent one of the main natural hazards. This kind of hazards mainly affect the workers' safety and the accessibility of the area.

Avalanches are events that occur when a coherent mass of snow is detached in correspondence to a base layer and slides down a slope. They may be triggered by an increase of load on the snowpack because of meteoric events or by a progressive weakening of the snowpack because of its transformation. An avalanche may also be triggered by an increase of load on the snowpack induced by human or animal activity or by seismic events.

The following three main conditions are necessary for the occurrence of an avalanche:

- a snowpack with cohesion among snow crystals;
- a weak layer or a favourable slide plan at the base or inside the snowpack;
- a slope characterized by an inclination greater than 25°.

In the Wind Farm area, wind turbines are located in correspondence to the top of the mountain ridge, where avalanche hazard is negligible. Nevertheless, access roads in some cases run along mountain slopes. Figure 2 shows the distribution of topographic surface areas with inclination greater than 25°, red dashed lines highlight areas where slopes with inclination greater than 25° stand above access roads. Compared to the total extension

of access roads, few areas are potentially affected by avalanches; the most extend one is represented by the existing road bypassing wind turbines II-15, II-16, II-17 and II-18. Along this road section the maximum elevation of the slope portion with inclination greater than 25° is about 70 m; in case of heavy snowfall, in this area avalanche hazard may be not negligible.

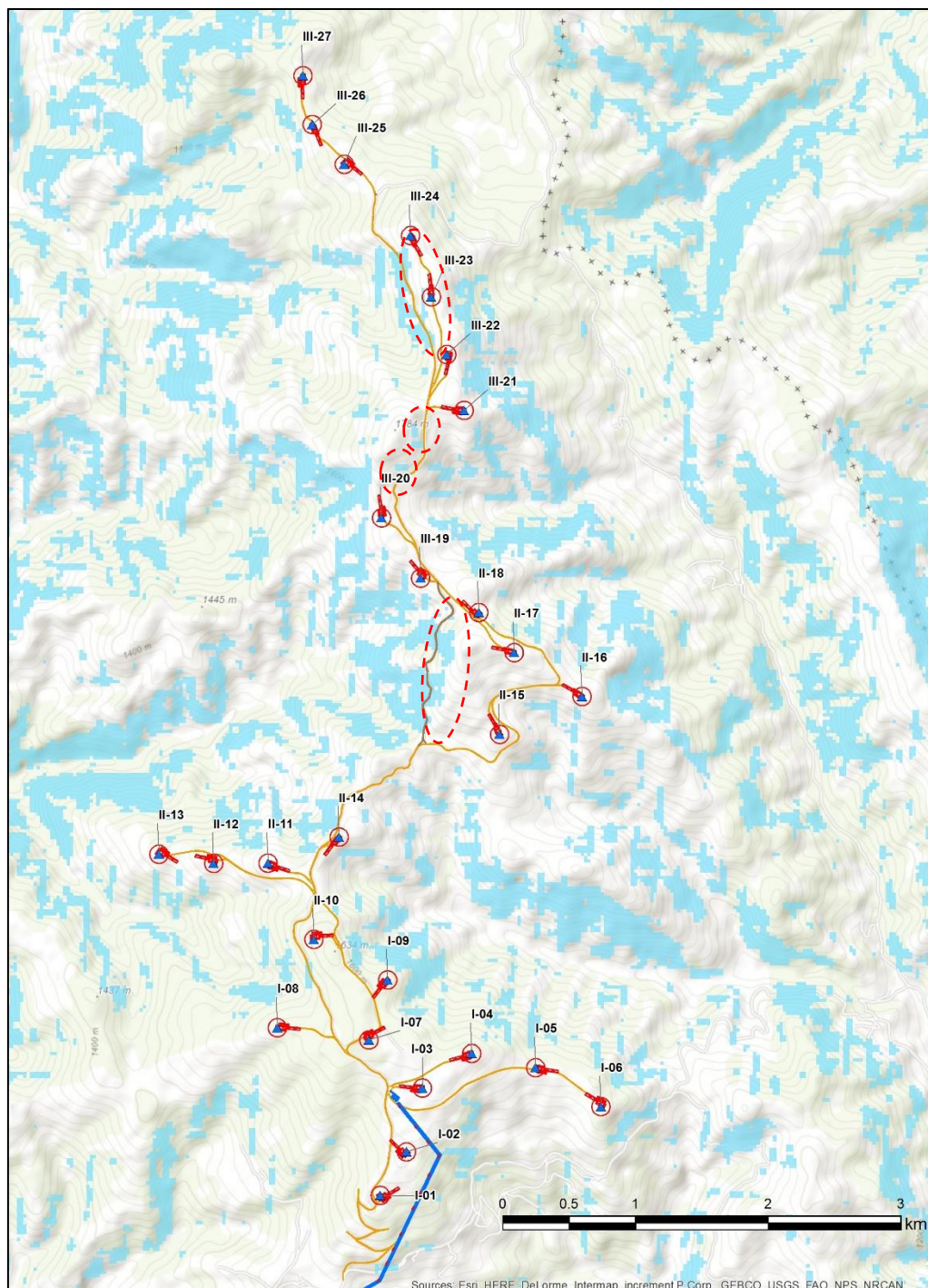


Figure 2: Blue areas: slope with inclination greater than 25° . Red dashed lines: areas where slope with inclination greater than 25° stand above access roads

With regard to Wind Farm area accessibility, the following measures shall be adopted during construction and operation phases:

- in case of light snowfall access roads cleaning will be performed by a vehicle owned by the SOWI Kosovo and based in Bajgora;
- in case of heavy snowfall an external company will be hired to clean the access roads;
- in case of emergency at least two snowmobile vehicles, owned by the SOWI Kosovo and based in Bajgora, may be used to access the site. These vehicles shall be equipped with frost resistant GPS and operated by trained personnel;
- in presence of snow only main access road and wind turbine access roads shall be used. Access to the existing roads bypassing wind turbines I-09 and II-10 and wind turbines II-15, II-16, II-17 and II-18 shall be interdicted. Beside the above-mentioned road sections, access to all wind turbines shall be continuously provided during winter season;
- in mountain areas wind may move and deposit light snow, leading to the formation of snowdrifts and potentially unstable snow accumulations. If weather conditions are windy road accessibility and the presence of potentially unstable snowdrifts shall be verified before accessing to Wind Farm area.

The outline of access roads in Wind Farm area in case of snow is reported in **Figure 3**.

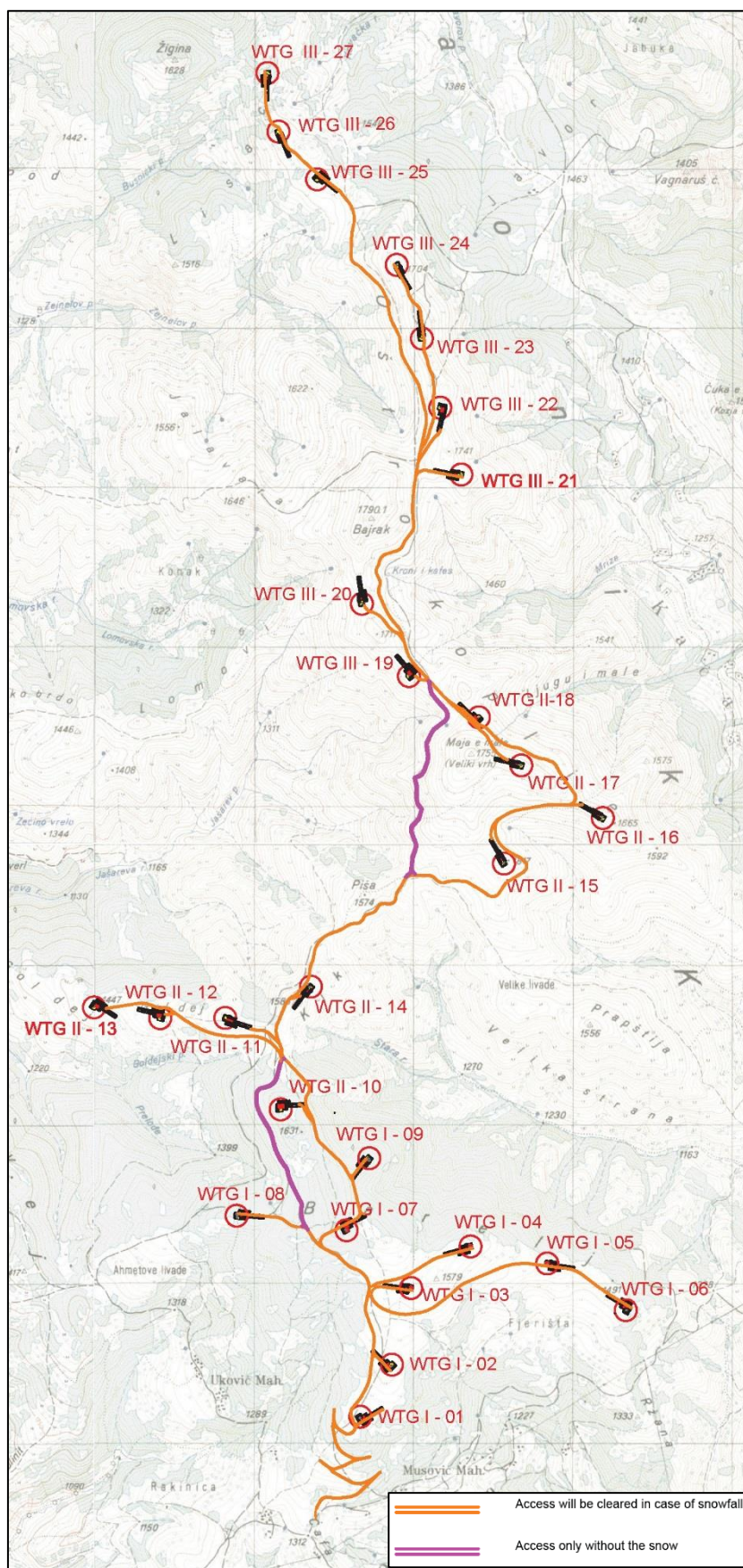


Figure 3: Outline of access roads in the Wind Farm area in case of snow

6.3 Geomorphology and topography

6.3.1 Regional geomorphological setting

Kosovo shows a prevalent mountainous morphology, with two principal plain areas: Kosovo plain, with altitude ranging from 510 to 570 m a.s.l. and Dukagjini plain, with altitude ranging from 350 to 450 m a.s.l. The average altitude of Kosovo topographical surface is 810 m a.s.l., the highest relief is the 2656 m high Gjeravica mountain. With regard to altitude, the distribution of the Kosovo surface is the following:

- <0.1 % of the surface is located below 300 m a.s.l. (4.16 km²);
- 80.7 % of the surface is located between 300 m a.s.l. and 1000 m a.s.l. (8754 km²);
- 17.2 % of the surface is located between 1000 m a.s.l. and 2000 m a.s.l. (1872.3 km²);
- 2.3 % of the surface is located above 2000 m a.s.l. (250.6 km²).

Geomorphology of relief areas is strongly controlled by local geological and structural setting, while in plain areas morphology is mainly related to the deposition of Pleistocene and Quaternary deposits and is controlled by fluvial dynamics.

6.3.2 Local geomorphology

6.3.2.1 Wind Farm

Selac 1, 2 and 3 areas of the Wind Farm are located along mountain ridges representing the watershed of different secondary hydrographic basins. The elevation of wind turbines locations ranges from about 1420 m a.s.l. to 1715 m a.s.l.

Main processes controlling the geomorphological evolution of the area are:

- Physical and chemical weathering of bedrock;
- Erosion induced by meteoric running water;
- Gravity induced transport.

In mountain areas main geohazard are related to accelerated erosion phenomena, landslides and avalanches. In the Wind Farm area, no relevant landslide phenomena were observed during site visit and investigations carried out. No large rock slope with high inclination stand above wind turbine locations or access roads, therefore no relevant rockfall phenomena are expected in the area.

Some evidences of accelerated erosion phenomena induced by running meteoric water may be observed in correspondence to slopes and secondary streams close to watershed areas (**Figure 4**).

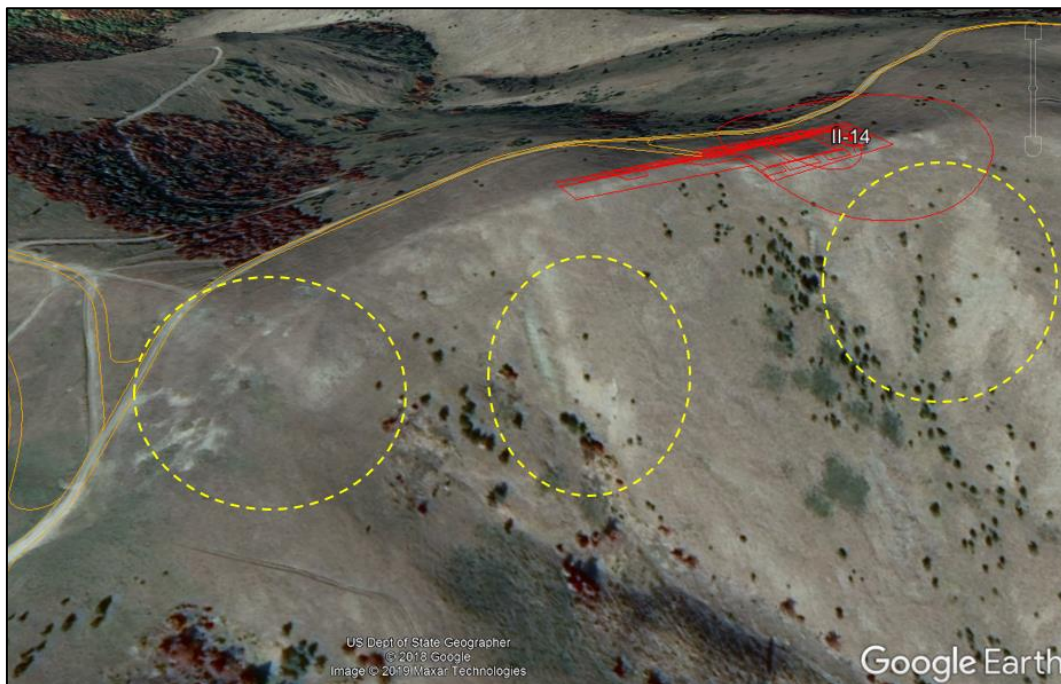


Figure 4: Evidences of accelerated erosion phenomena (yellow dashed lines) in wind turbine II-14 area

Information about spatial distribution of erosion hazard in Kosovo is provided by the document *Spatial Plan of Kosova 2010-2020+* ("Kosovo Spatial Plan"). **Figure 5** shows an extract of the erosion map included in the Kosovo Spatial Plan, with location of the Wind Farm and the OHL. Based on information reported in **Figure 5** Selac Wind Farm areas are mainly located in zones prone to medium erosion; only wind turbines II-15 to II-17 appear to be located in zones prone to strong erosion phenomena.

6.3.2.2 OHL

OHL extends from mountain area, close to the wind farm's substation, to Sitnica River alluvial plain area. Elevation of OHL ranges from 1555 m a.s.l. to 510 m a.s.l.. In the mountain area the evolution of local geomorphological setting is controlled by the same processes described regarding the Wind Farm (§ Section 6.3.2.1). In the alluvial plain local geomorphological setting is mainly controlled by depositional and erosional phenomena linked to fluvial dynamics. In the area of OHL crossing Sitnica River mainly shows a meandering channel pattern.

With regard to mountain area, potential geohazards in OHL are the same described with regard to Wind Farm areas. Frequency of accelerated erosion's evidences tends to decrease with elevation's decrease; in lower part of mountain area in fact slope inclination is lower and vegetation cover is more widespread.

Based on information reported in **Figure 5**, in the mountain area OHL is located in areas prone to medium to low erosion. Only from chainage 10.3 km to 11.4 km OHL appears to be located in an area prone to very strong erosion. In Sitnica River plain area erosion potential hazard ranges from medium to very low.

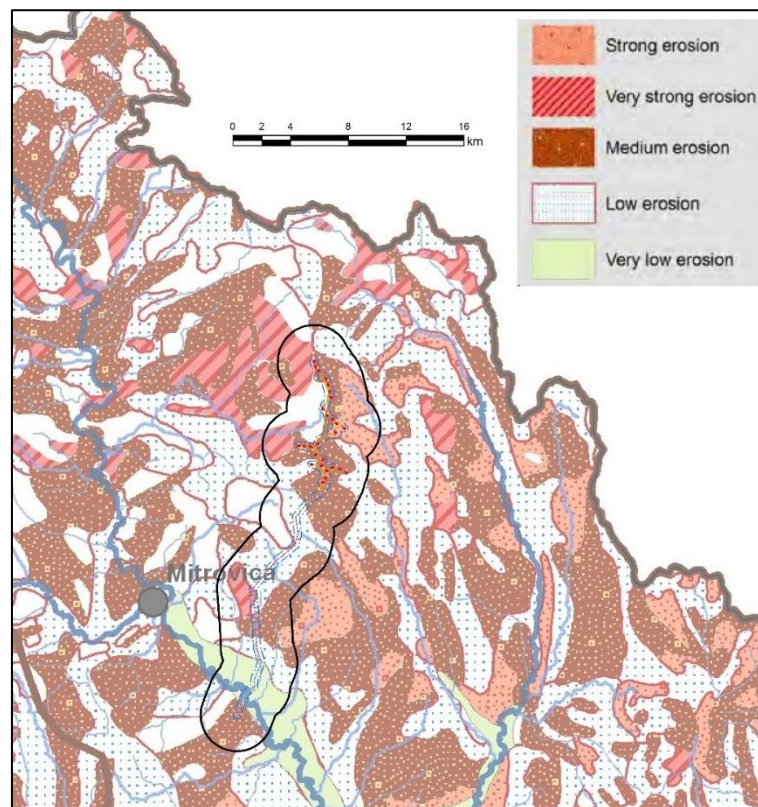


Figure 5: Extract of erosion map from Kosovo Spatial Plan 2010-2020+ with location of the Aol

In Sitnica River plain area geohazards are mainly related to flooding. Kosovo Spatial Plan provides a map of areas potentially affected by flooding, based on information provided by the Master Plan on Waters (1983). According to this map, Sitnica River valley north of Vushtrri city, is an area potentially affected by flooding; based on **Figure 6**, from chainage 17.1 km to 19.5 km the OHL appears to be located in this area. The connection point between the OHL and the existing substation is located outside the potential flood area. This evidence is supported by the fact that the substation is located inside an existing industrial and residential area, that has likely been developed outside the river valley sector characterized by higher flood hazard. Desktop study showed that existing literature data and studies do not provide a probabilistic assessment of flood hazard.

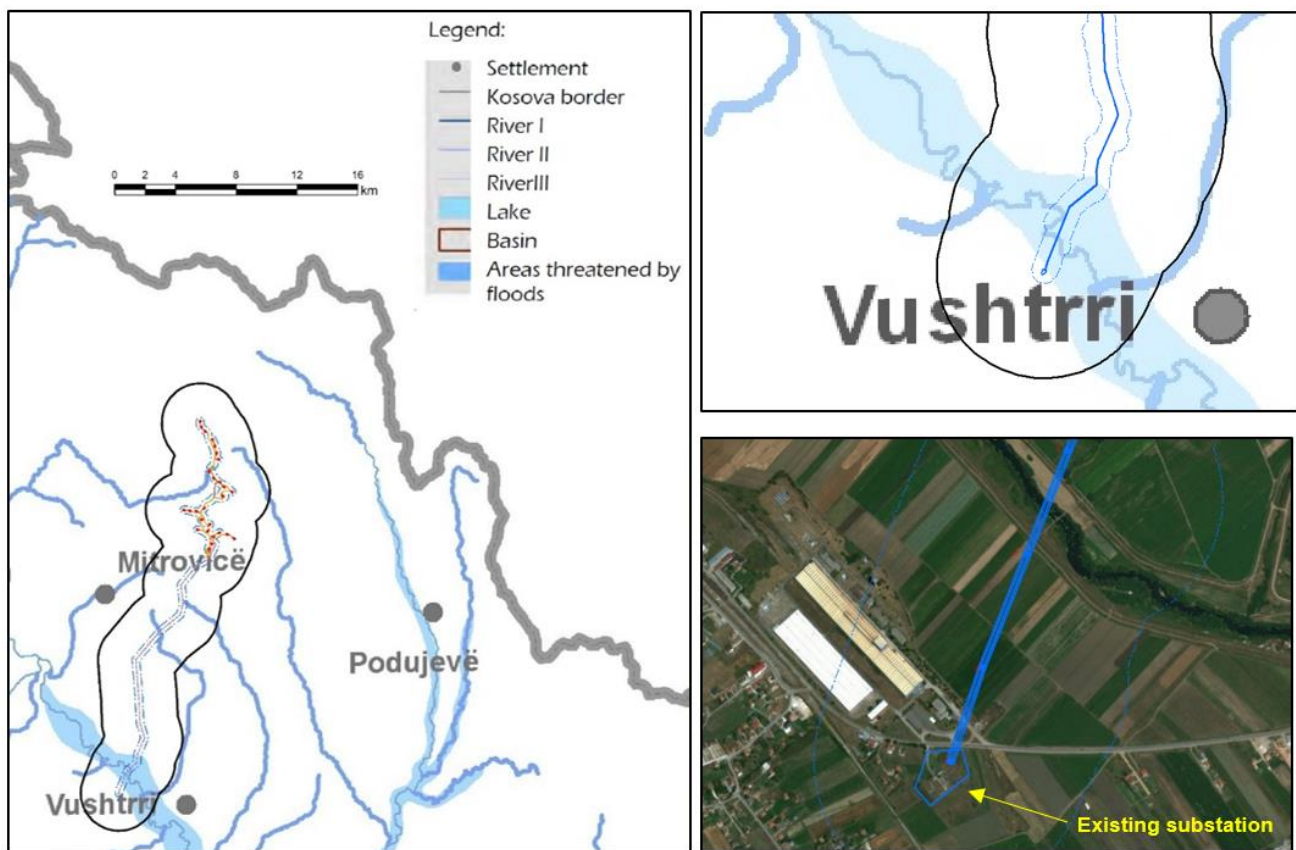


Figure 6: Extract of flood hazard map from Kosovo Spatial Plan 2010-2020+ with location of the Aol and location of the existing substation to which the OHL will be connected

6.3.3 Sensitivity of the component

In the Wind Farm the main feature contributing to the sensitivity of the component is represented by the presence of accelerated erosion phenomena. Evidences of natural occurring accelerated erosion were observed in the areas of the wind farm; construction operations and meteoric water management may enhance existing phenomena or trigger new ones. The sensitivity of the geomorphology component in the Wind Farm area is estimated to be **high**.

In the area of the OHL the sensitivity of the component is mainly defined by the presence of areas with relevant flood hazard in the Sitnica River plain area. In the mountain area along the OHL accelerated erosion risk is lower than in the wind farm area, because of the lower inclination of slopes and the more developed vegetation cover. The sensitivity of the geomorphology component in the OHL area is estimated to be **low** because only a small portion of the line is located in area with relevant flood hazard.

6.4 Geology and seismicity

6.4.1 Regional geology

With regard to regional geological and geodynamic setting, Kosovo is located in the Alpine-Himalayan orogenic system, in the transition area among Dinarides, Albanides and Hellenides mountain belts. These mountain belts formed during the Alpine orogeny, starting from the Cretaceous.

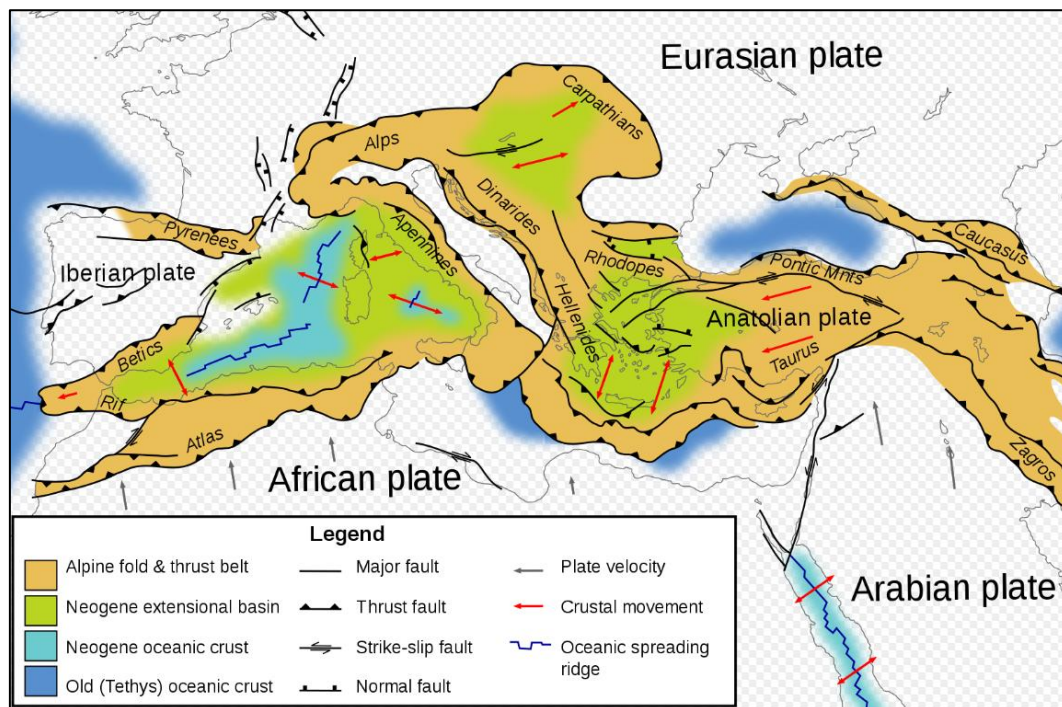
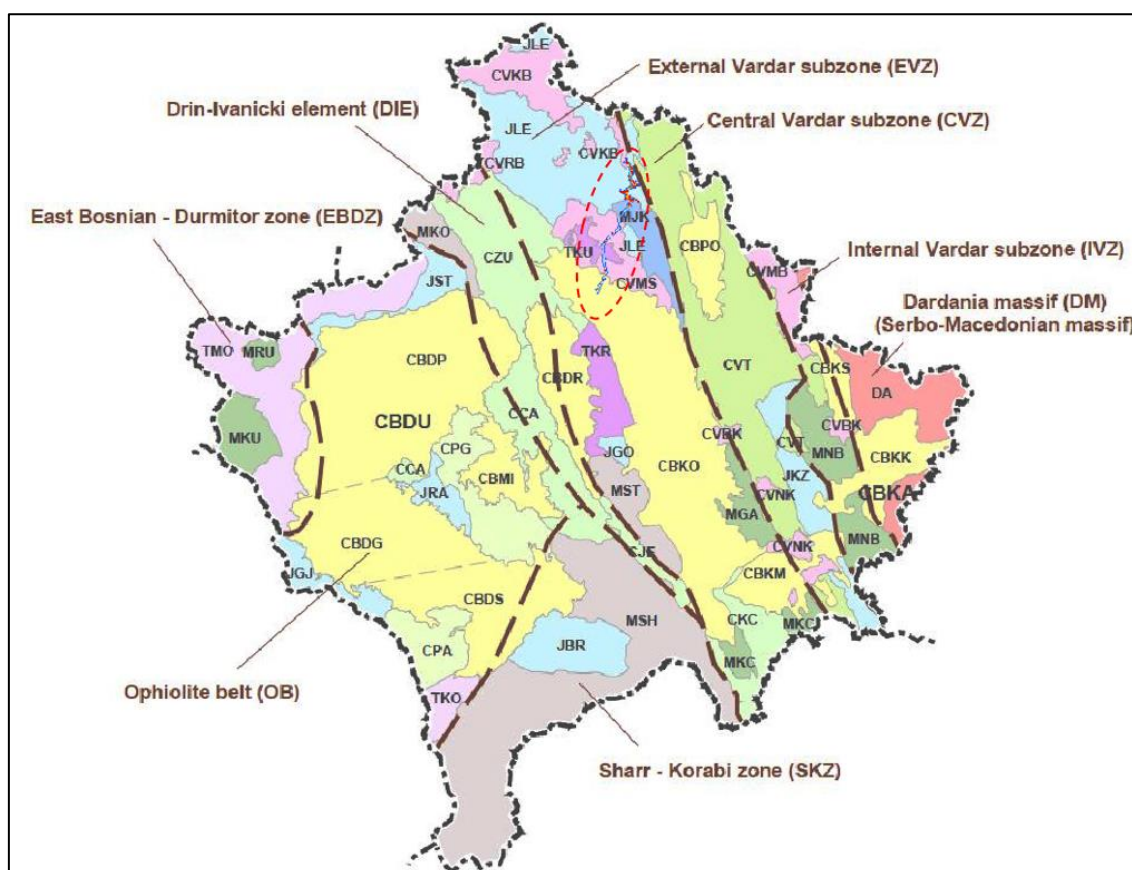


Figure 7: Tectonic map of the Mediterranean area

At a regional scale Kosovo can be subdivided into three main structural and geological domains:

- **Dardania massif** (Serbo-Macedonian massif): comprised of Paleozoic and Proterozoic geological formations and representing the Eurasian plate Hercynian bedrock (DM in **Figure 8**);
- **Vadar zone**: mainly comprised of Mesozoic rocks, ranging from sedimentary to volcanic, ultramafic rocks and ophiolitic complexes. The Vardar zone represents the most mobile zone of the Dinarides-Hellenides. This lithologically heterogeneous and tectonically complicated zone was built in the Upper Jurassic and Lower Cretaceous; it represents the mega-suture of Vadar-Tethys ocean resulting from Alpine orogeny (IVZ, CVZ, EVZ in **Figure 8**);
- **Drenica/Korabi – Pelagonian zone**: mainly comprised of Paleozoic magmatic/metamorphic rocks and Mesozoic sedimentary rocks and ophiolitic complexes (DIE, EBDZ, OB and SKZ in **Figure 8**).

Regional trend of main geological structures (folds, faults and thrusts) reflects the NNW-SSE orientation of the orogenic system.



- wind turbines **I-08** and **I-09** are located in correspondence to the contact between **Unit sJ2-3** and **Unit vsJ2-3**, represented by a volcanic-sedimentary series. The contact between these two units is a “structural” one and is represented in the map as an “indicated” fault.

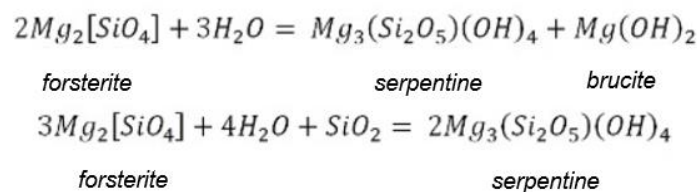
Wind turbines of the **Selac 2** area are located in correspondence of the following units:

- wind turbines from **II-10** to **II-13** are located in correspondence to **Unit vsJ2-3**;
- wind turbines from **II-14** to **II-18** are located in correspondence to **Unit σJ2-3** comprised of ultramafic rocks: peridotite and dunite, partly serpentinized;

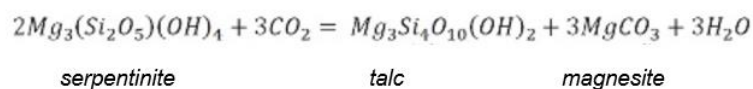
Wind turbines of the **Selac 3** area are located in correspondence of the following units:

- wind turbines from **III-19** to **III-25** are located in correspondence to **Unit σJ2-3**;
- wind turbines from **III-26** and **III-27** are located in correspondence to **Unit λEo-Nm** comprised of latite volcanic rock.

Unit σJ2-3 includes ultramafic rocks that, through the “serpentinization” process may be transformed into serpentinite rock. Serpentinization is a hydration process that may lead to the formation of natural asbestos minerals (e.g. chrysotile) according to the following reactions.



The potential presence of natural occurring asbestos in the Aol is confirmed also by information included in the GIS database of Republic of Kosovo Independent Commission for Mines and Minerals³. This database shows the presence of an asbestos mineral deposit about 1.2 km SE of wind turbine I-06. This deposit is called “*Picelj deposit*” (database n° K34-43/434) and it has been studied to the level of “detailed exploration” (yellow star symbol in **Figure A.2**). Another evidence of the presence of serpentinized ultramafic rocks is provided by the presence of several magnesite deposits NW of the Aol, represented by the green star symbol in **Figure A.2**. In this kind of geological context magnesite is formed through carbonation reactions involving serpentinite rock, according to the following reaction.



In the Wind Farm areas bedrock in general is overlain by a 0.1 to 0.5 m thick cover of eluvial-colluvial deposits, resulting from the weathering of the bedrock. In correspondence to wind turbines I-3, I-6, II-12, II-18 and III-27 the presence of slope debris deposit was observed during geotechnical investigation. In correspondence to wind turbines I-3, I-6, I-7, II-12, II-13 and II-18 geotechnical investigation put in evidence the presence of eluvial-colluvial deposits or completely weathered bedrock layers with pluri-metric thickness. In particular, two boreholes drilled in correspondence to wind turbine I-3, to a depth of 18-20 m b.g.l., did not reach the bedrock.

³ <https://www.kosovo-mining.org>

The above-mentioned potential presence of natural occurring asbestos in areas with serpentinized ultramafic rocks is not limited to the rock mass of the bedrock. Asbestos may also be included in the Quaternary eluvial-colluvial deposits formed by the weathering and the erosion of an asbestos bearing bedrock.

Figure 9 highlights the spatial distribution of serpentinized ultramafic rocks related to **Unit σ J2-3**, depicted in the above-mentioned **Figure A.2 (Appendix A)**.

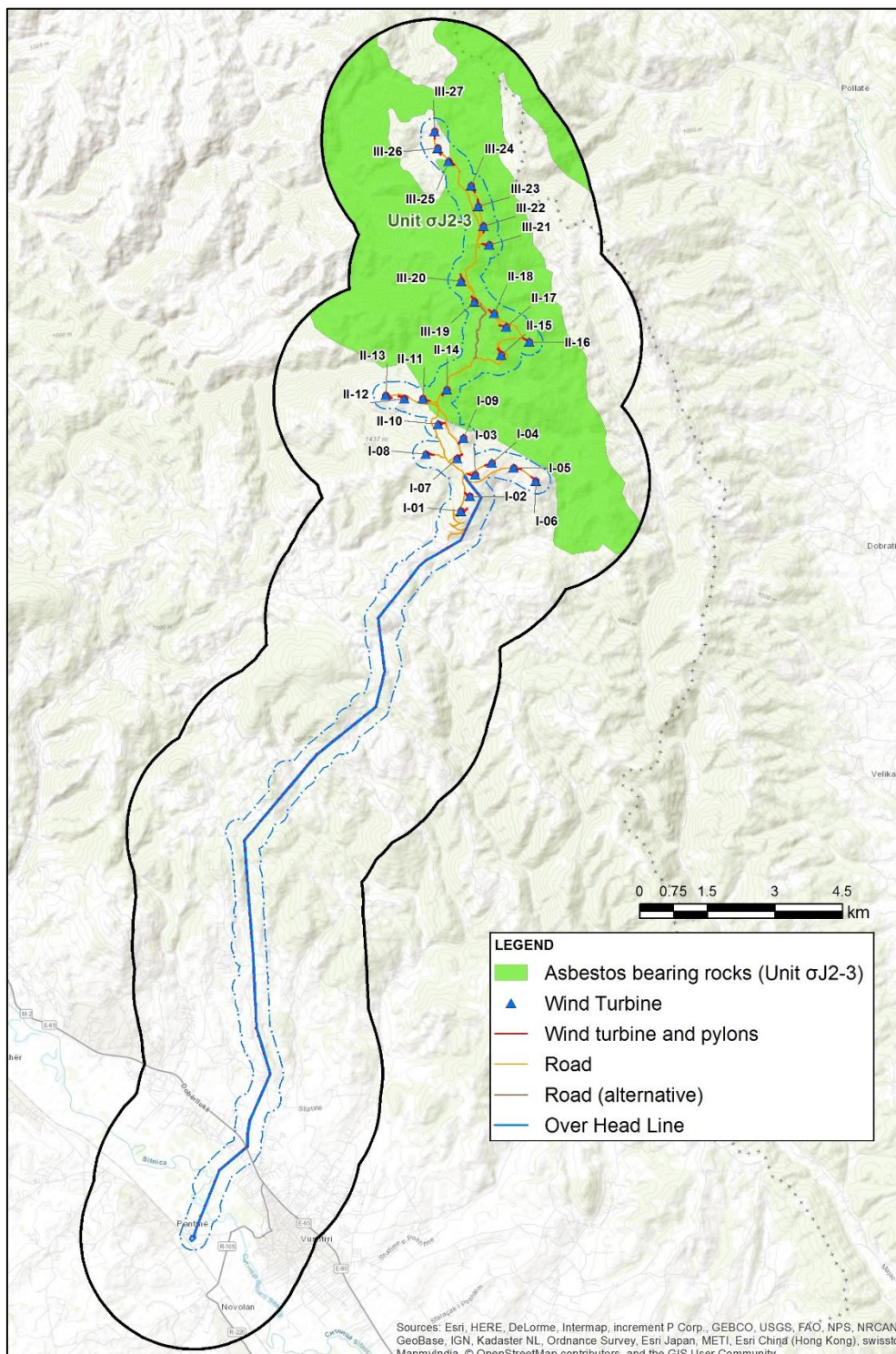


Figure 9: Spatial distribution of asbestos bearing rocks (Unit σ J2-3) in the Aol

Preliminary investigations were carried out during early works to verify the presence of natural occurring asbestos in the following samples:

- rock samples collected in the area of wind turbines **I-08, I-09, II-11** and **II-14**;
- crushed rock samples collected in the area of wind turbines **I-01, I-04, I-09** and **II-14**.

Presence of natural occurring chrysotile asbestos was confirmed in rock samples from wind turbines **II-11** and **II-14** and in crushed rock samples from wind turbine **II-14**.

Based on these evidences, baseline investigations were carried out in order to define the presence and the concentration of natural occurring asbestos in subsoil (bedrock, surface deposits) and in top soil in correspondence to some locations of the Wind Farm area. Sampling locations were selected according to the following rationale:

- 2 sampling locations located inside the area where natural occurring asbestos are expected (§. **Figure 9**);
- 1 sampling location located outside the area where natural occurring asbestos are expected;
- 2 sampling locations located close to the boundary of the geological unit **σJ2-3**, where the presence of natural occurring asbestos is uncertain. In detail areas of wind turbines **II-11** and **III-26** were selected (only bedrock was sampled at **III-26** location).

Baseline sampling was carried out in area unaffected by anthropic activity and early works. Subsoil sampling have been carried out by means of continuous coring drillings, to a depth equal to the maximum subsoil thickness affected by future excavation/construction activities at each sampling point. Top soil sampling have been carried out with manual equipment, to a depth of 10-15 cm.

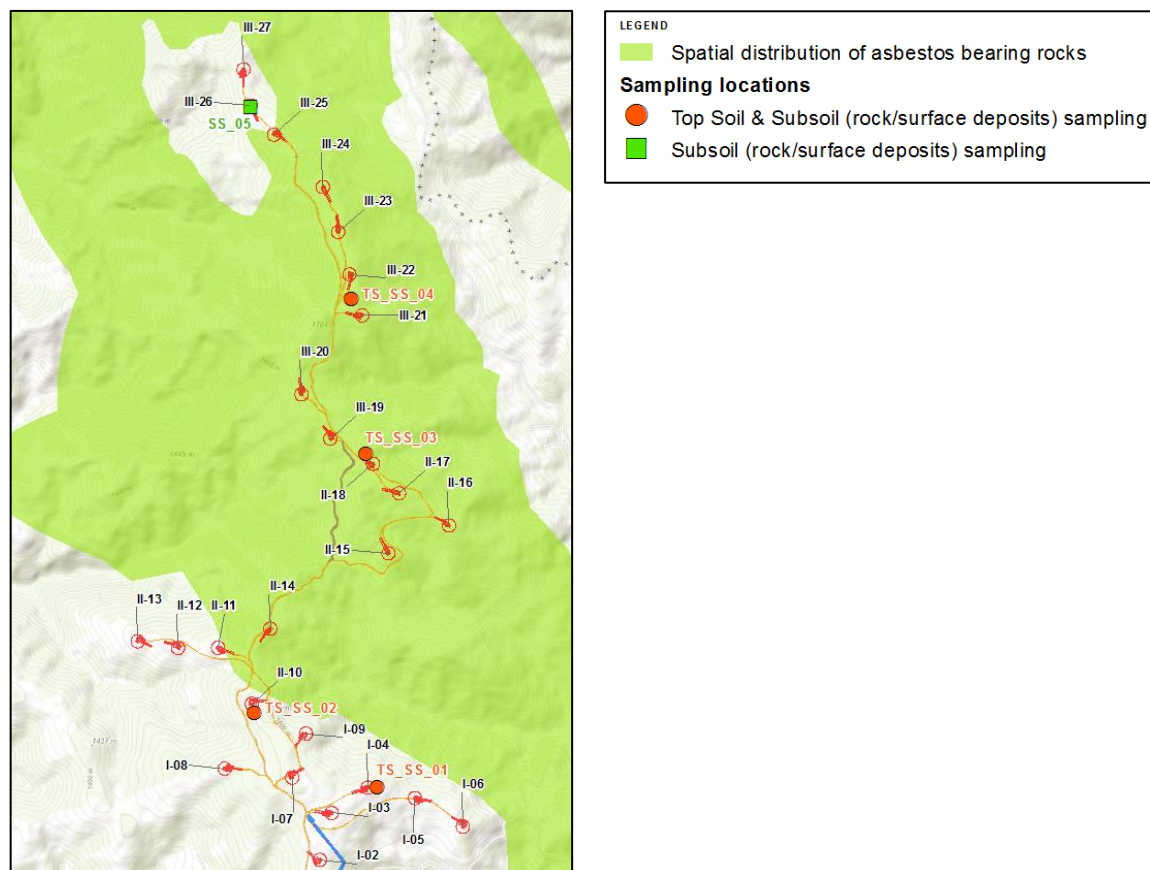


Figure 10: Location of subsoil and top soil baseline sampling points

The following **Table 1** summarizes the results of SEM⁴ analysis carried out on subsoil samples collected, results of analyses carried out on top soil samples are not yet available.

Table 1: Results of baseline asbestos analysis on subsoil samples

| Borehole location | Sample depth interval (m b.g.l.) | Local geological setting | Presence of asbestos (Y/N) | Asbestos concentration (% mass) |
|-------------------|----------------------------------|--|----------------------------|---------------------------------|
| TS_SS_01 | 2-3 | Area were natural occurring asbestos <u>are not expected</u> | N | 0 |
| TS_SS_01 | 5-6 | | N | 0 |
| SS_05 | 3-4 | Area located close to the boundary of the geological unit σJ2-3 , where the presence of natural occurring asbestos is uncertain | Y (chrysotile) | 1.28 |
| SS_05 | 6-7 | | N | 0 |
| TS_SS_02 | 2-3 | Area located close to the boundary of the geological unit σJ2-3 , where the presence of natural occurring asbestos is uncertain | N | 0 |
| TS_SS_02 | 6-7 | | N | 0 |
| TS_SS_03 | 2-3 | Area were natural occurring asbestos <u>are expected</u> | N | 0 |
| TS_SS_03 | 6-7 | | N | 0 |
| TS_SS_04 | 2-3 | Area were natural occurring asbestos <u>are expected</u> | Y (chrysotile) | 1.76 |
| TS_SS_04 | 4-5 | | Y (chrysotile) | 0.52 |

Based on preliminary investigations and the results summarized in **Table 1**, the following can be observed:

- in the area of geological unit **σJ2-3**, natural occurring asbestos are not ubiquitous. The distribution of natural asbestos in the rock mass is heterogenous, because of their own development mechanisms; moreover, it may be strongly controlled by local fracture pattern of the rock mass. The presence of asbestos in this unit may also depend on the serpentinization degree of the ultramafic rocks comprising the bedrock.
- the actual location of the geological boundaries reported in the Geological Map of Kosovo shall be verified in the field. The uncertainty about the actual location of these boundaries is mainly related to the difference between the scale of the geological map (1:200.000) and the scale of project design.

⁴ Scanning Electron Microscope

6.4.2.2 OHL

The following section provides a description of OHL location with respect to geological formations reported in the Geological Map of Kosovo (scale 1:200.000). No direct information is available with regard to local geological subsurface conditions along the OHL.

Starting from the substation located close to Selac 1 area, the OHL crosses the geological formations listed in **Table 2**.

Table 2: Description of geological units along the OHL

| Start chainage (km)* | End chainage (km) | Geological unit | Description |
|----------------------|-------------------|----------------------------|---|
| 0 | 3.7 | Unit sJ2-3 | Meta-sedimentary silicate rocks: schists, phyllites and gneisses (middle-upper Jurassic) |
| 3.7 | 6.1 | Unit vpEo-Nm | Pyroclastic rocks (Oligocene – Pliocene) |
| 6.1 | 7.2 | Unit λEo-Nm | Latite volcanic rock (Oligocene – Pliocene) |
| 7.2 | 10.0 | Unit vpEo-Nm | Pyroclastic rocks (Oligocene – Pliocene) |
| 10.0 | 12.6 | Unit sPZ2 | Greenschist, phyllite, mudstone, chert (upper Paleozoic) |
| 12.6 | 15.8 | Unit vpEo-Nm | Pyroclastic rocks (Oligocene – Pliocene) |
| 15.8 | 17.5 | Unit Np¹ | Clastic sediments, clay, sand, gravel, marl, carbonate lenses, burnt rock, lignite (lower Pliocene) |
| 17.5 | 18.0 | Unit tQp | Fluvial terraces: gravel, sand (Pleistocene) |
| 18.0 | 19.6 | Unit aQh | Alluvium: gravel, sand, silt (Holocene) |

As observed with regard to the Wind Farm area, also along the OHL crystalline bedrock is probably overlain by a cover comprised of eluvial-colluvial deposits resulting from the weathering of the bedrock or by slope debris deposits.

About structural settings, based on the Geological Map of Kosovo it is possible to observe that, in correspondence to geological units **vpEo-Nm** and **sPZ2**, the OHL is located in areas where the presence of fault zones is reported.

Serpentinized ultramafic rocks comprising **Unit σJ2-3** do not outcrop along the OHL, therefore no asbestos bearing rocks are expected in the OHL area (**Figure 9**).

6.4.3 Seismic setting

The Area of influence is located in a complex and active geodynamical context, the Alpine-Hymalayan orogenic system. A summary of Kosovo seismotectonic setting is provided in literature by Elezaj (2009)⁵; information

⁵ Elezaj, Z. - *Seismotectonic Settings of Kosova*, J. Int. Environmental Application & Science, Vol. 4 (2): 167-176 (2009)

concerning seismogenic sources is provided by the European Database of Seismogenic Faults (EDSF). This database was compiled in the framework of the EU Project SHARE⁶, it includes only faults that are deemed to be capable of generating earthquakes of magnitude equal to or larger than 5.5 and aims at ensuring a homogeneous input for use in ground-shaking hazard assessment in the Euro-Mediterranean area. Several research institutions participated in the creation of the EDSF database.

With regard to historical seismicity the following main seismic events were recorded (from Elezaj, 2009):

- earthquake of Prizren, 16 June 1456 with epicentre intensity $I_0=9$ scale MCS⁷ and magnitude 6.6 Richter scale;
- earthquake of Peje, 11 November 1662 with epicentre intensity $I_0=8$ scale MCS and magnitude 6.0 Richter scale;
- earthquake of Ferizaj, 26 February 1755 with epicentre intensity $I_0=9$ scale MSK-64⁸ and magnitude 6.1 Richter scale;
- earthquake of Ferizaj-Viti, 10 August 1921 with epicentre intensity $I_0=9$ b scale MCS and magnitude 6.1 Richter scale;
- earthquake of Kopaonik, 18 May 1980 with epicentre intensity $I_0=8$ scale MCS and magnitude 6.0 Richter scale (Sulstarova et al, 2000; Orana et al., 1985; Elezaj, 2001; Pekevski, 2001).

During the 20th century and until now, territory of Kosovo have been affected by 82 earthquakes with intensity 5 scale, from them 34 earthquakes with intensity 6 scale, 12 earthquakes with intensity 7 scale, 10 earthquakes with intensity 8 scale (1 earthquake belongs to period before 1900) and 3 earthquakes with intensity 9 scale (2 earthquakes belong to period before 1900) (Elezaj, 2001). A distribution of earthquake epicentres and magnitude values from 1900 to 2004 is provided by the Kosovo Spatial Plan (**Figure 11**).

⁶ Seismic Hazard Harmonization in Europe: <http://www.share-eu.org/>

⁷ MCS: Mercalli Cancani Sieberg scale (macroseismic intensity)

⁸ MSK-64: Medvedev-Sponheuer-Karnik scale (macroseismic intensity)

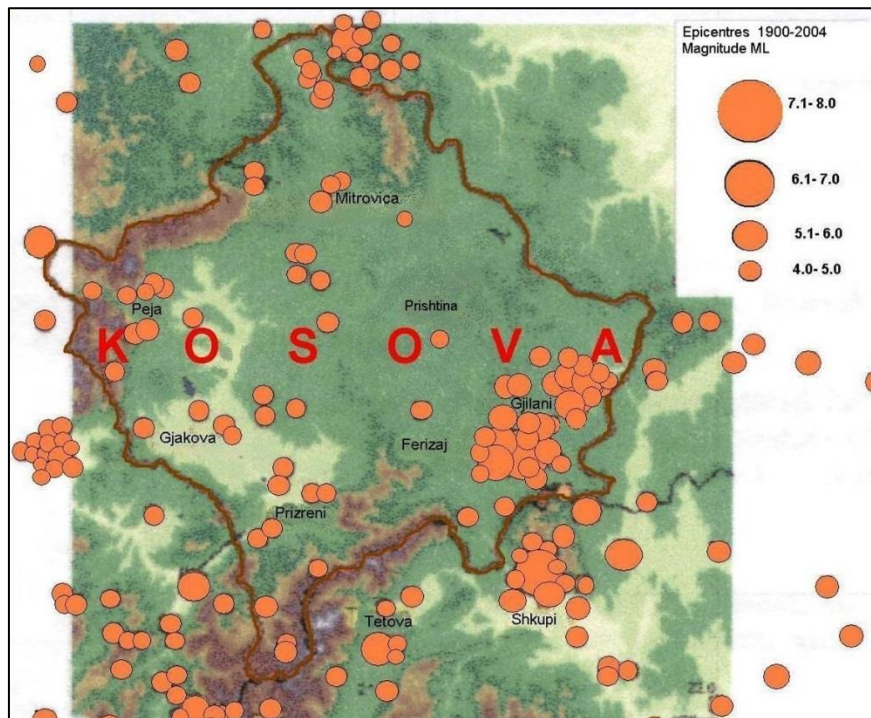


Figure 11: Map of seismic epicentres and magnitude 1900-2004 (from *Kosovo Spatial Plan 2010-2020+*)

EDSF database includes 8 composite seismogenic sources located in Kosovo, shown in **Figure 12**. One of these sources, defined as “Pristina” with ID Code KMCS005, is located along Sitnica River valley and shows a maximum magnitude (M_w) of 6.0. KMCS005 seismogenic source is included in the Aol and is located close to the southern end of the OHL.

Map reported in **Figure 12** also provides an estimation of seismic hazard, represented as Peak Ground Acceleration (“PGA”) for a 500 years return period. Aol is located in areas with expected PGA ranging from 0.15 to 0.20. In Elezaj (2009) it is stated that, based on available data (Arsovski, 1985 modified by Elezaj & Kodra, 2008) “[...] Kosovo can be a land subject to considerable seismic hazards in the specified future foreseen according to Eurocode 8 for calculation of seismic constructions.”

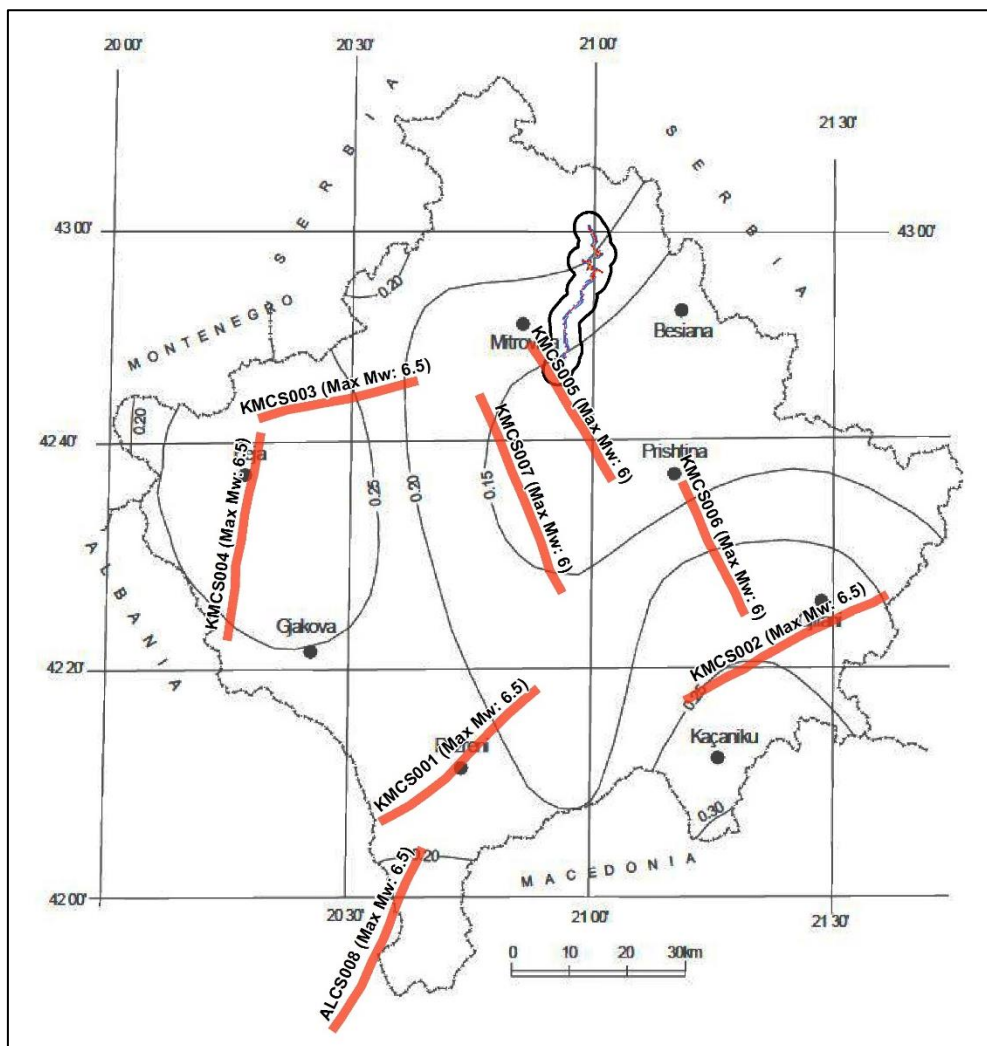


Figure 12: Peak Ground Acceleration (PGA) contour for 500 years return period. Red lines: composite seismic sources identified in EDSF database, with source ID code and maximum magnitude

6.4.4 Sensitivity of the component

In the Wind Farm area, the main feature contributing to the sensitivity of the component is represented by the potential presence of natural occurring asbestos. In areas with serpentinized ultramafic rocks asbestos may be included not only in the bedrock rock mass, but also in Quaternary eluvial-colluvial deposits formed by its weathering and erosion. In the case of the Wind Farm area seismicity in another relevant element contributing to the sensitivity of the component, indeed there are sectors potentially affected by topographic and stratigraphic amplification of seismic waves. Given the potential health risk connected to the dispersion of airborne asbestos fibres the sensitivity of the geology component in the Wind Farm area is estimated to be **very high**.

In the area of the OHL the main feature contributing to the sensitivity of the component is represented by seismicity. The final part of the OHL is located close to a seismic source with maximum magnitude of 6. Along the OHL there are areas potentially affected by topographic and stratigraphic amplification of seismic waves, such as narrow ridges or thin Quaternary covers overlying crystalline bedrock. The sensitivity of the geology component in the OHL area is estimated to be **medium**.

6.5 Soils and land use

6.5.1 Regional soils and land use

In the Kosovo Spatial Plan, it is emphasized that the country does not have an organized land monitoring system, therefore no updated data concerning land use and land degradation are available. The only spatial information available in the Kosovo Spatial Plan concern the distribution of forest, pasture and high quality agricultural land (**Figure 13**). Based on information reported in **Figure 13** it is possible to observe that forests area mainly located in correspondence to the Wind Farm area and the upper part of the OHL. High quality agricultural land is located in the Sitnica river valley.

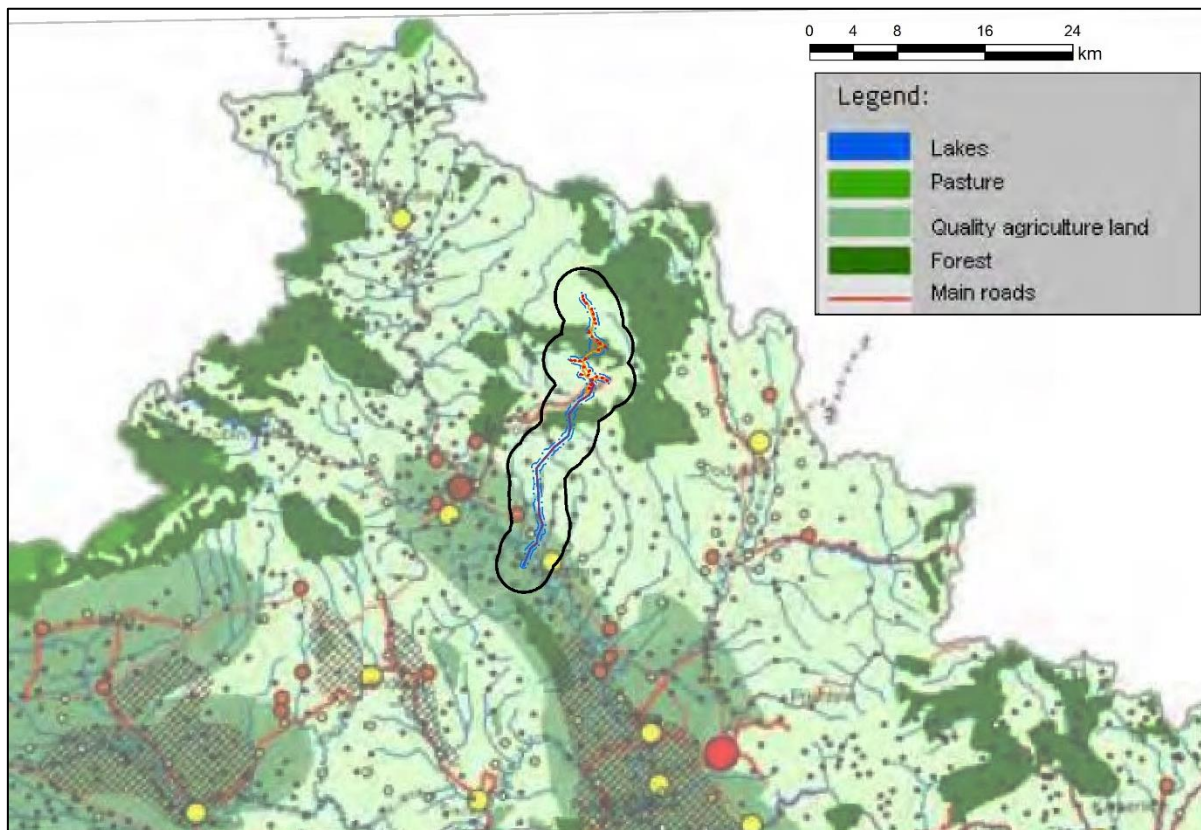


Figure 13: Extract of “Occupation of qualitative agricultural land” map from Kosovo Spatial Plan 2010-2020+ with location of the Aol

Updated information about land use at a regional and local scale can be deduced from land cover data. The most updated information about land cover is provided by the 2012 and 2018 update of the CORINE Land Cover inventory (“CLC2012” and “CLC2018”); the land cover project is part of the CORINE program and is intended to provide consistent localized geographical information on the land cover of the 12 Member States of the European Community.

The 1:200.000 scale Soil Map of Kosovo⁹ provide the most recent summary of regional hydrogeological and hydrological setting of Kosovo. This map is a comprehensive overview presentation of the soils in Kosovo based on the available soil map sheets at a scale 1:50,000 from 1974.

The soil classification used for the map corresponds to the common regional soil classification. The distinction of the soils is partly based on the internationally known soil types (e.g. regosol, rendzina, gley) according to the

⁹ Independent Commission for Mines and Minerals, Beak Consultants GmbH (November 2006)

systematic from FAO-UNESCO; partly based on the granulometric soil species (e.g. sandy soil, loamy soil, clayey soil); and partly on the soil substrata and the stage of soil development (e.g. degree of weathering of ferrous minerals: brownisation). As a result, different classifications like “regosol on flysch”, “brownised deluvium” or “shallow brown soil on schists” are represented on the map side by side. Nevertheless, the classification applied on the map shows the most important soil characteristics. Based on the presented information, the user is able to derive possibilities for different specific land use, environmental aspects, necessary soil conservation, pedogenesis and other pedologic facts.

With regard to regional land cover statistics, the European Environment Agency provided the following information, based on a comparison between 2006 and 2012 Corine land cover data¹⁰. The following table shows a summary of the results of the above-mentioned comparison (**Figure 14**).

| | Artificial areas | Arable land & permanent crops | Pastures & mosaics | Forested land | Semi-natural vegetation | Open spaces/ bare soils | Wetlands | Water bodies | TOTAL [hundreds ha] |
|-------------------------------------|------------------|-------------------------------|--------------------|---------------|-------------------------|----------------------------|------------|--------------|------------------------|
| Land cover 2006 | 328 | 1167 | 3213 | 5183 | 807 | 181 | 10 | 23 | 10912 |
| Consumption of initial LC | 2.8 | 16.9 | 20.8 | 21.1 | 2.7 | 2.1 | 0.0 | 0.0 | 66 |
| Formation of new LC | 28.6 | 16.3 | 1.3 | 9.8 | 0.0 | 10.3 | 0.0 | 0.0 | 66 |
| Net Formation of LC | 25.8 | -0.5 | -19.5 | -11.3 | -2.7 | 8.2 | 0.0 | 0.0 | 0 |
| Net formation as % of initial year | 7.8 | 0.0 | -0.6 | -0.2 | -0.3 | 4.5 | 0.0 | 0.0 | |
| Total turnover of LC | 31.4 | 33.2 | 22.2 | 30.8 | 2.7 | 12.4 | 0.0 | 0.0 | 133 |
| Total turnover as % of initial year | 9.6 | 2.8 | 0.7 | 0.6 | 0.3 | 6.8 | 0.0 | 0.0 | 1.2 |
| Land cover 2012 | 354 | 1166 | 3193 | 5172 | 804 | 189 | 10 | 23 | 10912 |

Figure 14: Land cover 2006-2012 balance table (from European Environmental Agency – Land cover 2012 Kosovo Country fact sheet)

Based on CLC2012 the main land use categories in Kosovo are the following:

- artificial areas (including urban): 3%;
- artificial areas (including urban): 3%;
- open space/base soils: 2%;
- semi-natural vegetation: 7%;
- forest land: 48%;
- pasture and mosaics: 29%;
- arable land and permanent crops: 11%;
- wetlands: 0.1%;
- water bodies: 0.2%.

¹⁰ European Environmental Agency – Land cover 2012 Kosovo Country fact sheet

The analysis of 2006-2012 land use change mainly shows a stationary trend. A slight decrease of pasture, forest and semi-natural vegetation areas is observed, together with an increase of artificial areas and opens spaces/bare soil.

6.5.2 Local soils and land use

Distribution of land use categories in the Area of influence, based on CLC2018, archive is reported in **Figure A.3, Appendix A**. The spatial distribution of pedological units and soil types described in the 1:200.000 scale Soil Map of Kosovo¹¹ is reported in **Figure A.4, Appendix A**.

6.5.2.1 Wind Farm

The following section describes the local land use in the Wind Farm area, based on CLC2018 archive (**Figure A.3, Appendix A**). It also provides a description of Selac wind turbines locations with respect to the pedological formations reported in the 1:200.000 scale Soil Map of Kosovo (**Figure A.4, Appendix A**).

Local land use in the part of Aol concerning the Wind Farm is the following:

- broad-leaved forest: 41.4%;
- natural grassland: 36.2%;
- transitional woodland-shrub: 14.4%;
- sparsely vegetated areas: 5.6%;
- mixed forest: 0.6%;
- land principally occupied by agriculture, with significant areas of natural vegetation: 1.2%
- pastures: 0.5%.

With regards to soil, wind turbines comprising **Selac 1** area are located in correspondence of the following pedological units:

- wind turbines **I-01, I-02, I-07, I-08** and **I-09** are located in correspondence to **Unit 89** comprised of “Moderately deep soil on schists”;
- wind turbines from **I-03** to **I-06** are located in correspondence to **Unit 88** comprised of “Shallow brown soil on schists”.

Wind turbines comprising **Selac 2** area are located in correspondence of the following pedological units:

- wind turbine **II-10** is located in correspondence to **Unit 89** comprised of “Moderately deep soil on schists”;
- wind turbines from **II-11** to **II-18** are located in correspondence to **Unit 33** comprised of “Typical rendzina on serpentinite”;

Wind turbines comprising **Selac 3** area are all located in correspondence to **Unit 33** comprised of “Typical rendzina on serpentinite”.

Rendzina type soils on ultramafic rocks (like serpentinite) are shallow, with a humous and skeleton-rich A horizon, with a high proportion of magnesium and heavy metals, but are poor in essential nutrients.

¹¹ Independent Commission for Mines and Minerals, Beak Consultants GmbH (November 2006)

6.5.2.2 OHL

The following section describes the local land use in the OHL area, based on CLC2018 archive (**Figure A.3, Appendix A**). It also provides a description of OHL location with respect to the pedological formations reported in the 1:200.000 scale Soil Map of Kosovo¹² (**Figure A.4, Appendix A**).

Local land use in the part of Aol concerning the OHL is the following:

- broad-leaved forest: 36.8%;
- natural grassland: 3.7%;
- transitional woodland-shrub: 5.1%;
- land principally occupied by agriculture, with significant areas of natural vegetation: 17.3%
- pastures: 1.7%;
- complex cultivation patterns: 5.7%;
- non-irrigated arable land: 21.5%;
- burnt areas: 0.7%;
- discontinuous urban fabric: 7.6%.

With regards to soil, starting from the substation located close to the Selac 1 area, the OHL crosses the pedological formations listed in Table 3.

Table 3: Description of pedological formations along the OHL

| Start chainage (km)* | End chainage (km) | Pedological unit | Description |
|----------------------|-------------------|------------------|--|
| 0 | 1.3 | 89 | Moderately deep soil on schists |
| 1.3 | 1.8 | 18 | Loamy deluvium |
| 1.8 | 2.1 | 88 | Shallow brown soil on schists |
| 2.1 | 3 | 89 | Moderately deep soil on schists |
| 3 | 4.4 | 88 | Shallow brown soil on schists |
| 4.4 | 5.4 | 89 | Moderately deep soil on schists |
| 5.4 | 6.8 | 92 | Moderately deep brown soil on intermediate rocks |
| 6.8 | 8.2 | 95 | Moderately deep brown soil on acid rocks |
| 8.2 | 10 | 92 | Moderately deep brown soil on intermediate rocks |
| 10 | 12.7 | 91 | Shallow brown soil on intermediate rocks |
| 12.7 | 15.1 | 92 | Moderately deep brown soil on intermediate rocks |

¹² Independent Commission for Mines and Minerals, Beak Consultants GmbH (November 2006)

| Start chainage (km)* | End chainage (km) | Pedological unit | Description |
|----------------------|-------------------|------------------|----------------------------------|
| 15.1 | 15.7 | 50 | Smonitsa leached with pseudogley |
| 15.7 | 16.9 | 47 | Noncalcareous smonitsa |
| 16.9 | 17.9 | 23 | Meadow loamy soil |
| 17.9 | 18.5 | 12 | Loamy alluvium |
| 18.5 | 18.9 | 11 | Sandy-loamy alluvium |
| 18.9 | 19.4 | 13 | Clayey alluvium |
| 19.4 | 19.6 | 12 | Loamy alluvium |

Based on data reported in Table 3, the following can be observed:

- mountain area is characterized by the presence of shallow to moderately deep soils, formed on intermediate to acid (felsic) rocks;
- in Sitnica River plain area, in correspondence to terraced Pliocene and Pleistocene deposits, smonitsa type soil is prevalent. Smonitsa soil is a heavy clay Vertisol soil with a high proportion of swelling clays, which can be found in the area of the flood plains and the proluvial sediments. They are dark to black coloured and have a high humous content. Another characteristic is their nutrient-richness. Meadow soil is a Gleysoil; it includes wetland soils that, unless drained, are saturated with ground water for long enough periods to develop a characteristic gleyic colour pattern. They can be found in the floodplains above loamy-clayey subsoil.
- in the lower part of Sitnica River plain, in correspondence to Pleistocene to Holocen fluvial deposits, alluvium type soil is prevalent. Alluvium soil have a variable content of clay, silt and sand, resulting mainly in Cambisol like brown soil.

6.5.3 Sensitivity of the component

In the Wind farm the presence of shallow soil in slope areas prone to accelerated erosion is the main sensitive aspect of the component. In areas with shallow soil, natural or induced accelerated erosion phenomena may lead to significant soil loss. Soil loss hazard is higher in area with high slope inclination and reduced vegetation cover; in the Wind Farm areas 40.1% of the Aol surface comprises grassland and pastures. The sensitivity of the soil component in the Wind Farm area is estimated to be **medium**.

In the area of the OHL the sensitivity of the component is mainly defined by two elements:

- presence of shallow soil in mountain slope areas along the OHL. As stated above in the mountain area along the OHL accelerated erosion risk is lower than in the wind farm area, because of the lower inclination of slopes and the more developed vegetation cover;
- presence of soil with relevant agricultural potential in the Sitnica River plain area;

The sensitivity of the soil component in the OHL area is estimated to be **low**.

6.6 Hydrology and surface water

6.6.1 Regional hydrology

Concerning hydrology, at a regional scale Kosovo may be divided into four main hydrographical river basins: the Drini i Bardhe, Ibri, Morava-Binçës and Lepeneci.

Kosovo rivers flow towards three sea basins: Black Sea, Adriatic Sea and Aegean Sea. The main rivers that flow to the Black Sea are: Ibri (or Iber), Sitnica (with its branches Llapi and Drenica) and Morava-Binçës. The Drini i Bardhe river with its tributaries (Lumëbardhi i Pejës, Lumëbardhi i Decanit, Lumëbardhi i Prizrenit, Klina, Ereniku, Mirusha, Toplluha and Plava) flows into the Adriatic Sea. The Lepenci river with its main tributary (Nerodime) flows to the Aegean Sea. The average hydrographic flow ratio ranges from 3.93 l/sec/km² (Morava-Binçës) to 42.46 l/sec/km² (Lumëbardhi i Decanit) (**Figure 16**). Base data of main rivers of Kosovo and related hydrographical basins are reported in **Figure 15**.

| River | Area (S) km ² | Length of river (L) km | Flow (Q) m ³ /s | (q) l/sec/km ² | Slope % | Perimeter of basin (Km) | Annual flow x10 ⁶ (m ³) | Effective precipitation (mm) | Average precipitation (mm) | Coefficient of flow | Flows into |
|--------------------|--------------------------|------------------------|----------------------------|---------------------------|------------|-------------------------|--|------------------------------|----------------------------|---------------------|--------------|
| Drini i Bardhë | 4340.14 | 110.7 | 61.7 | | 2.1 | 409.8 | 1946 | 452.5 | 900 | 0.508 | Adriatic Sea |
| Sushica | 49.4 | 17.25 | | | 9.4 | 32 | | | 1150 | | |
| LB.Pejë | 464.8 | 57 | 10.21 | 24.13 | 2.5 | 128 | 200.66 | 760.1 | 1168 | 0.651 | |
| LB.Deçanit | 259.3 | 53 | 7.84 | 42.46 | 3.2 | 105 | 152.46 | 1337.4 | 1530 | 0.874 | |
| Ereniku | 519.3 | 51.74 | 12.16 | 26.73 | 3.9 | 109 | 383.04 | 841.8 | 1515 | 0.716 | |
| Istogu | 405.3 | 19.74 | 6.98 | | 4.5 | 87 | | | 1200 | | |
| Klina | 458.7 | 72.12 | 2.8 | 4.92 | 4.5 | 126 | 65.52 | 154.9 | 750 | 0.221 | |
| Mirusha | 336.7 | 37 | 1.661 | | 1.7 | 83 | | | 700 | | |
| Toplluha | 495 | 34.05 | 3.44 | | 3.5 | 108 | | | 1000 | | |
| LB.Prizrenit | 247.8 | 36.07 | 6.49 | 29.68 | 7.4 | 77 | 147.74 | 935.1 | 960 | 0.974 | |
| Plava, Restelic | 341.86 | 22.12 | 5.25 | 20.79 | 5.9 | 90.56 | 165.06 | 655 | 1080 | 0.644 | |
| Basin total | 4682 | 110.7 | 61.01 | | 2.1 | 409.8 | 1946 | 452.5 | 900 | 0.508 | |
| Ibri | 4044.21 | 89.50 | 36.4 | 6.39 | 0.3 | 436.8 | 1148 | 218.4 | 782 | 0.301 | Black Sea |
| Sitnica | 2912 | 78 | 13.94 | 5.38 | 1.1 | 276 | 439.11 | 169.5 | 690 | 0.258 | |
| M.Binçës | 1564 | 76 | 8.7 | 5.99 | 1.5 | 216 | 330 | 188.8 | 736 | 0.256 | |
| Kriva Reka | 640.70 | 44.5 | 4.43 | 7.27 | 1.2 | 128 | 139.55 | 229.1 | 736 | 0.311 | |
| Lepenci | 653 | 50 | 8.4 | 14.91 | 4.6 | 130 | 190 | 469.8 | 912 | 0.516 | Aegean Sea |
| Nerodime | 209.4 | 38.5 | | | 2.1 | 81.5 | | | 750 | | |
| Total | 10 907.00 | | 121.2 | | | | 3.8*10⁶ | | | | |

Figure 15: Base data of main Kosovo rivers (from Republic of Kosovo - Report on the state of water, 2015)

Main artificial lakes in Kosovo are: Batllava, Gazivoda, Radoniqi, Perlepnica and Badovci; a small number of artificial irrigation basins is also present.

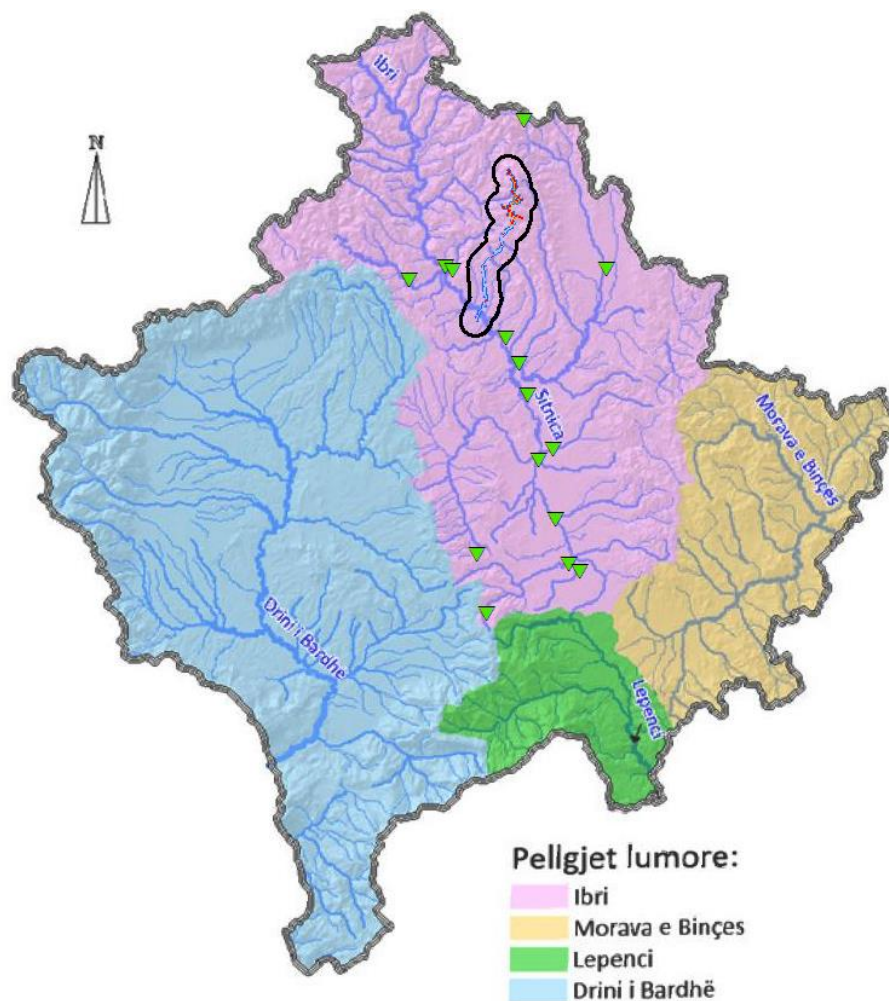


Figure 16: Main hydrographic basins of Kosovo (from Republic of Kosovo, Series 2: Agriculture and Environment Statistics - Water Statistics 2017). Green triangles: water quality monitoring station in Ibri river basin

6.6.2 Local hydrology

6.6.2.1 Wind farm

Area of influence is located in Sitnica river basin, that included in the Ibri river basin (**Figure 16**). Selac Wind Farm area does not include major surface water bodies. The watershed area where the wind farm is located includes the heads of several secondary stream valleys. Two of these stream valley heads host a spring, as described in section 6.7.2.1. Above mentioned secondary streams are not characterized by perennial water flow, with the exception of those fed by springs. Water flows towards stream valley heads during meteoric events and during thaw season, because of melting snow. Secondary hydrographic network in wind farm area flows into Trepça, Shala e Bajgorës rivers, that are tributaries of Sitnica river.

Two wetland areas were observed south of wind turbines I-01 and I-02. These wetlands are probably fed by local springs and meteoric water (**Figure A.5, Appendix A**).

6.6.2.2 OHL

In the mountain area, OHL crosses several heads of secondary stream valleys, in a morphological context similar to that described in the previous section with regards to the wind farm area. In addition, the OHL crosses some stream valleys where the presence of perennial water flow is probable. These crossings are located at chainages 3.5 km, 5.8 km, 7.4 km and 16.6 km.

In Sitnica River plain the OHL crosses the river at 613 m from the end of the line. Trellises T-3 and T-4 are located respectively at 109 m and 114 m from the riverbank. In the river plain area an anthropic secondary hydrographic network may be present, comprised of irrigation ditches.

6.6.3 Water quality

Information concerning surface water quality in Kosovo is provided by “Reports on state of water” issued by the Ministry of environmental and spatial planning – Kosovo Environmental protection agency. Here follows a summary of information reported in the most recent available report, issued in 2015.

With regard to Sitnica river the report states that *“Starting from Ferizaj and up to Mitrovica, this is the most polluted river in Kosovo. Regarding physical parameters, suspended materials are present and exceed maximum allowed values. This is caused by the flow of Nerodime River, the rivers of Shtime, Graçanka, Prishtevka, Drenica, Llap and Trepça and other smaller streams into it, which contain household and industrial water discharges. The monitoring of chemical parameters such as the quantity of dissolved oxygen and SHBO5 indicate permanent pollution of the river.”*

18 monitoring stations are located in the Ibri river basin, 5 of them are permanent and monitored twice a year, the other 13 are represented by sampling points along water courses. No monitoring stations are included in the Area of influence (**Figure 16**).

Hydrochemical monitoring data included in 2015 Report on state of water cover the time period from 2010 to 2013 (“reference period”):

- **BOD5:** in the Ibri basin the highest BOD5 values were registered in the Prishtevka River at the Bresje monitoring station, ranging from 19.67 mg/l O₂ in 2010, 11.43 in 2011, to 14.18 mg/l O₂ in 2012. In 2013, the highest BOD5 marked an increase in Prishtevka River in Bresje, reaching a value of 14.88 mg/l O₂;
- **pH:** during the reference period pH values in Ibri basin ranged from 7.68 to 8.49;
- **Nitrate (NO₃⁻):** The highest average annual values (“AAVs”) of the parameter of Nitrogen-nitrate for 2010 and 2011 were registered in the Sitnica River in Sitnica at 2.252 mg/l NO₃⁻ and 2.398 mg/l NO₃⁻, respectively. Regarding 2012 and 2013, the highest respective AAVs of 1.921 mg/l NO₃⁻ and 2.614 mg/l NO₃⁻ were registered in the Drenica River in Vragoli;
- **Nitrite (NO₂⁻):** The highest AAVs of this parameter for 2010, 2011 and 2012 were registered in the Sitnica River sampling site in Mitrovica, at 0.185 mg/l, 0.175 mg/l and 0.154 mg/l respectively. Eventually, in 2013 the highest AAV of 0.136 mg/l was registered in the Sitnica River sampling site in Plemetin. These data imply a poor water quality of this river;
- **Metals¹³:** in Ibri basin the following metals showed concentration values exceeding maximum allowed values defined by local regulation¹⁴ (“MAV”): chromium, manganese, iron.
 - **chromium:** In 2011, the presence of Chromium exceeded MAV at the following stations: Kelmend for Iber River, Marinca and Podujeva for Llap River, and Vojnovc for Shtime River. In 2012, MAV exceeding was recorded at the monitoring station in Vragoli for the Drenica River. In 2013, Chromium concentration exceeded MAV in the monitoring stations of Mitrovica and Kelmend along the flow of Iber River, and at Bresje monitoring station of the Prishtevka River;
 - **manganese:** In 2011, Manganese concentration exceeded MAV at the following monitoring stations: Kelmend for Iber River, Vragoli, Plemetin and Mitrovica for Sitnica River, Podujeva for Llap River,

¹³ Data concerning metals refer to the 2011-2013 time period.

¹⁴ LEGISLATIVE DECREE No. 152 dated 11 May 1999, Provisions on water protection from pollution, Directive 91/271/EEC for treatment of discharged urban wastewater

Bresje for Prishtevka River, Vragoli for Drenica River and Vojnovc for Shtime River. In 2012, Manganese MAV exceeding was recorded in the following monitoring stations: Kelmend for Iber River, Vragoli and Mitrovica for Sitnica River, Podujeva for Llap River, Bresje for Prishtevka River, Vragoli for Drenica River and Vojnovc for Shtime River. Manganese concentration in 2013 exceeded the MAV in the same monitoring stations as in the two previous years: Mitrovica and Kelmend for Iber River, Plemetin and Mitrovica for Sitnica River, Podujeva and Millosheva for Llap River, Bresje for Prishtevka River and Vragoli for Drenica River.

- **iron:** In 2011, iron concentration MAV exceeding was registered at the Bresje monitoring station of the Prishtevka River and at the Vojnovc station for the Shtime River. In 2012, MAV exceeding was registered at these stations: Bresje for Prishtevka River, Vragoli for Graçanka River and Vojnovc for Shtime River. In 2013, the highest iron concentration was registered in the Prishtevka River at Bresje monitoring station and the Shtime River at Vojnovc station.

Sitnica river flow values were monitored at Nedakovc hydrometric station. In the reference period flow values ranged from 0.5 m³/s to 328 m³/s, with an average value of 13.62 m³/s.

In summary, available water quality data show that Sitnica river is affected by anthropic pollution evidenced by an increase of nitrate and nitrite concentration values and by exceedances of MAV for manganese.

6.6.4 Sediments

Information concerning mineralogical composition and chemical quality of sediments from Sitnica river are provided in the study *Analysis of sediments of the four main rivers (Drini i Bardhë, Morava e Binçës, Lepenc and Sitnica) in Kosovo* (Gashi et al., 2009) ("Sediments' study").

In the above-mentioned study samples of Sitnica river sediments were collected at five different sampling stations, which location is reported in **Figure 17**. Sampling point S4 is included in the AoI and is located about 1.8 km downstream the location of OHL crossing of Sitnica river.

With regard to mineral composition, samples of sediments collected along Sitnica river comprise:

- quartz (>30%);
- minerals from feldspar group (10-30%), except station S5 (5-10%);
- minerals from mica group, chlorite group and calcite group (5-10%).

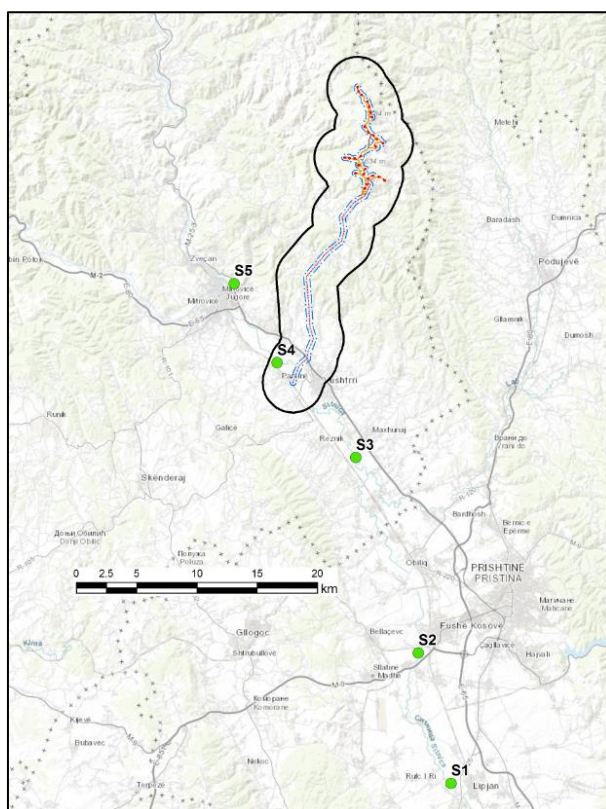


Figure 17: Location of sampling stations of Sitnica river sediments (Gashi et al., 2009)

In addition, the sediments' study includes the discussion of chemical data concerning toxic trace elements (As, Cd, Cr, Cu, Pb, Zn, Mn, Hg, Ni, P and Ag). The discussion is based on the comparison among measured concentration values and criteria for sediment quality by SMSP, Falconbridge NC, SAS¹⁵:

- concentrations values of arsenic (As) above that causing significant toxic effects (33 ppm) were measured in sediment samples at locations S2 and S5;
- concentration values of cadmium (Cd) above that causing significant toxic effects (10 ppm) were measured only at location S5;
- concentrations values of chromium (Cr) above 110 ppm, causing significant toxic effects, were measured at stations S2, S3 and S4;
- concentration values of copper (Cu) above that causing significant toxic effects (110 ppm) were measured only at location S5;
- concentration values of lead (Pb) above that causing significant toxic effects (250 ppm) were measured in sediment samples at locations S2 and S5;
- concentration values of zinc (Zn) above that causing significant toxic effects (200 ppm) were measured in sediment samples at locations S2 and S5;
- concentration values of manganese (Mn) above 1100 ppm, possibly causing significant toxic effects, were measured at all station located along Sitnica river (S1÷S5);

¹⁵ SMSP and FALCONBRIDGE NC SAS (2005). Koniambo project, Environmental and Social Impact Assessment, Chapter 4 Mine, 4.2-7 Quality criteria for freshwater sediment. Available at: http://www.falconbridge.com/documents/koniambo_esia/vol2/Chapter04/4_2_7/4_2_7.pdf

- concentration values of mercury (Hg) above that causing significant toxic effects (2 ppm) were measured in sediment samples at locations S2 and S5;
- concentration values of nickel (Ni) above that causing significant toxic effects (75 ppm) were measured at all station located along Sitnica river (S1÷S5). The highest value (329 ppm) was measured at S2;
- concentration values of phosphorus (P) slightly above 600 ppm, indicating minimal toxic effects, were found at locations S1, S2 and S5. The highest value (950 ppm) was measured at S1;
- among collected samples, highest concentration values of silver (Ag) were measured at two locations. At S1 the concentration is slightly above 0.5 ppm, indicating minimal toxic effects, while it is significantly higher at S5 (4.35 ppm).

The Authors of the study correlate anomalous metal content observed at locations S2 and S5 with anthropogenic pollution due to the industrial processes in the adjacent Kishnica and in Mitrovica towns. Moreover, in Sitnica river hydrographical basin ultramafic and volcanic rock formations are widespread; natural geochemical anomalies of all the above-mentioned elements (except phosphorus) may also be related to the erosion and transport of these types of bedrock.

6.6.5 Sensitivity of the component

In Wind Farm area the main feature contributing to the sensitivity of the component is represented by the presence of secondary streams not characterized by perennial water flow or fed by local springs and by the presence of wetlands, probably fed by local springs and meteoric water. These water bodies may locally host water ecosystems with high sensitivity to changes in water flow regime, turbidity and pollution. Relevant changes of these factors induced by construction or operation activities, such as excavation or meteoric water management, may cause a significant impact. The sensitivity of the hydrology component in the Wind Farm area is estimated to be **high**.

In the area of the OHL the sensitivity of the component is mainly defined by the following elements:

- presence of secondary streams with potential presence of water ecosystems;
- presence of the Sitnica River, that already shows a relevant anthropic pressure because of pollution of surface water and river sediments.

The sensitivity of the hydrology component in the OHL area is estimated to be **medium**.

6.7 Hydrogeology and groundwater

6.7.1 Regional hydrogeology

The 1:200.000 scale Hydrogeological Map of Kosovo¹⁶ provide the most recent summary of regional hydrogeological and hydrological setting of Kosovo.

The most relevant and productive aquifers are the coarsely grained Holocene and Pleistocene unconsolidated sediments, characterized by primary intergranular porosity. These aquifers are mainly located in the central and western part of Kosovo, in the catchments of the main rivers. Other important aquifers are those hosted in the karstified Jurassic and Triassic limestones, located in the western part of Kosovo.

In addition, several mineral and thermal water springs with discharges of more than 100 l/s (especially Banjë / Banja, Klokot / Klokot and Uglar / Ugljare) can be found in Kosovo representing an important water source and geothermal reservoir.

¹⁶ Independent Commission for Mines and Minerals, Beak Consultants GmbH (November 2006)

At a regional scale, the following categories of aquifers and aquiclude comprise the Kosovo hydrogeological setting:

- **Primary permeability aquifers (intergranular porosity):** Productive intergranular aquifers with very high to medium permeability ($> 10^{-5}$ m/s) consist of coarsely grained Holocene and Pleistocene unconsolidated sediments. Moderately productive intergranular aquifers with medium to low permeability (10^{-5} m/s to 10^{-9} m/s) consists of coarsely to fine grained Pleistocene and Neogene unconsolidated sediments and Palaeogene consolidated sedimentary deposits. The Pleistocene river sediments can generally be described as sandy gravels (more permeable), which are covered by silt (less permeable). Neogene sediments occur widespread in the area of the young Cenozoic basins. They are mainly Miocene and Pliocene clastic depositions of clay, sand, gravel (more permeable), marlstone, limestone, sandstone and conglomerate (less permeable). Often, the Pliocene formations are unconsolidated, except to the carbonatic formations (marlstone). The Miocene sediments are mostly consolidated and so less permeable. The Palaeogene is composed of Oligocene sedimentary rocks like conglomerate, mudstones, marlstones, limestones with tuffaceous intercalations (less permeable).
- **Secondary permeability aquifers (fracture porosity):** Fracture aquifers with medium to low fracture permeability (10^{-5} m/s to 10^{-9} m/s) are mainly Neogene, Palaeogene, Jurassic and Palaeozoic consolidated sedimentary, igneous and metamorphic rocks. Among the Miocene sedimentary rocks, fissured conglomerates, sandstones, mudstones, marlstones and marly claystones in the eastern part of Kosovo are considered as aquifers. Oligocene aged consolidated sedimentary rocks like marly limestones, sandstones, conglomerate, mudstones and marlstones in the eastern part of Kosovo can be regarded as aquifer where ground water mainly flows through fractures. Beside these, Oligocene fractured pyroclastites in the south-eastern and north-eastern part of Kosovo can be considered as local productive aquifers. In the northern part of Kosovo, fractured Jurassic (serpentinised) peridotites and sericite schists are characterised by local ground water flow through fractures. Among the Palaeozoic rocks, marbles / cherty calcareous schists / recrystallised limestones in the western part of Kosovo can contain local ground water on fractures.
- **Secondary permeability aquifers (fracture and karst porosity):** Fracture and karst aquifers with strongly variable, locally very high, permeability (10^{-3} m/s to 10^{-9} m/s) are primarily made up by Cretaceous, Jurassic, Triassic and Palaeozoic consolidated sedimentary rocks with karst phenomena. Often, the karst is just developed in smaller isolated areas of carbonate rocks between which terrains of impermeable rocks can be found. Among the Cretaceous sediments, massive sandy limestones, marly limestones, reef limestones and thin bedded limestones / mudstones in the western part of Kosovo are regarded as permeable. Also, Jurassic limestones and recrystallised limestones / marble olistoliths in the north western part of Kosovo are known to be karstified. Among the Triassic sedimentary rocks, limestones (with chert) and dolomites, marbles, and recrystallised limestones are considered as cavernous and permeable. From the Palaeozoic consolidated rocks, low to medium metamorphic calcareous schists and marbles can be regarded as permeable by fractures and karst. Of Palaeozoic age are also the permeable rocks, which crop out in the eastern part of Kosovo, where marbles are common as locally fractured and karst aquifers.
- **Mixed porosity aquifers (primary and secondary):** with double porosity (intergranular / fracture / karst) and medium to low permeability (10^{-3} m/s to 10^{-9} m/s) are limited to Holocene calcareous tufa and travertine. This kind of rock are represented by porous limestones formed by precipitation of calcium carbonate in correspondence to spring, thermal and river waters.
- **Aquicludes:** geological formations without considerable intergranular, fissured or karstified porosity (permeability $< 10^{-9}$ m/s) can be found widespread across Kosovo. Low-very low permeability bedrocks mainly include Neogene, Palaeogene, Cretaceous, Jurassic, Triassic, Palaeozoic and Proterozoic sedimentary, igneous (volcanic / plutonic) and metamorphic rocks. Miocene volcanic rocks complexes

which can be classified as aquicludes can be found in the northern part of Kosovo. Other low to very low permeability bedrocks are the Cretaceous sandstones, siltstones, marlstones, mudstones which can be found in the central part of Kosovo. Among the Triassic rocks, the volcanic–sedimentary series in the northern and north-western part of Kosovo and the quartzites, metasandstones and conglomerates in the central part of Kosovo are without considerable porosity and act as aquiclude. Also, Jurassic amphibolites/amphibole schists (in the southern part of Kosovo), diabase, gabbros and serpentinites/serpentinised peridotites / harzburgites do not host any significant ground water bodies. Among the Palaeozoic rocks, amphibolites / amphibole schists in the northern and southern part of Kosovo, biotite gneisses, metagranitic rocks in the eastern part of Kosovo, and metaquartz porphyre, schists, quartzites, quartz sandstones and metaquartz sandstones in the southern part of Kosovo act as aquiclude. The Proterozoic rocks in the eastern part of Kosovo, mainly amphibolites/amphibole schists and biotite gneisses, are considered to host no significant aquifers.

6.7.2 Local hydrogeology

Figure A.5 (Appendix A) reports the location of the Wind Farm and the OHL on the 1:200.000 scale Hydrogeological Map of Kosovo¹⁷ ("HMK"). The Wind farm areas are completely included in zones where bedrock comprises pre-Quaternary crystalline rocks (igneous or metamorphic). Also, the OHL is mainly located in areas with pre-Quaternary crystalline bedrock, but in the southern part the line is located in the Kosovo Cenozoic basin (CBKO) that comprises Pliocene and Quaternary deposits. **Figure A.5** also shows the location of hydrogeological features (springs, wetlands), wells and fountains reported in the ESIA study for the OHL produced by ECT and observed during field surveys.

Direct information concerning the local presence of groundwater in the Wind Farm area is provided by field surveys and geotechnical investigation carried out in correspondence to wind turbines' locations¹⁸. A sampling campaign of springs and fountains included in the 600 m wide buffer from Project footprint has been planned, in order to collect data concerning the current quality of water. Currently no data concerning groundwater quality in the Aol are available.

Table 4 reports a list of main information related to hydrogeological features reported in **Figure A.5**. **Figure 18** and **Figure 19** report some pictures of the surveyed springs and fountains.

Table 4: List of hydrogeological features reported in Figure A.5

| Feature ID code | Type | Flow regime | Evidence of spring use | X Coordinate (WGS84 -UTM34N) | Y Coordinate (WGS84 -UTM34N) | Elevation (m a.s.l.) |
|-----------------|----------|-------------|------------------------|------------------------------|------------------------------|----------------------|
| EW_01 | Well | n.a. | | 497755.547 | 4750687.692 | |
| EW_02 | Well | n.a. | | 496078.085 | 4750206.149 | |
| EW_03 | Well | n.a. | | 496587.938 | 4742669.742 | |
| EW_04 | Well | n.a. | | 495761.114 | 4742682.971 | |
| SP_01 | Fountain | Perennial | | 496691.510 | 4749235.402 | 855 |
| SP_02 | Fountain | Temporary | | 497756.559 | 4751461.608 | 900 |

¹⁷ Independent Commission for Mines and Minerals, Beak Consultants GmbH (November 2006)

¹⁸ Geological and geotechnical study carried out by Baugrund Linke GmbH in 2018

| Feature ID code | Type | Flow regime | Evidence of spring use | X Coordinate (WGS84 -UTM34N) | Y Coordinate (WGS84 -UTM34N) | Elevation (m a.s.l.) |
|-----------------|----------|-------------|------------------------|------------------------------|------------------------------|----------------------|
| SP_03 | Fountain | Perennial | | 499151.424 | 4753100.301 | 1156 |
| SP_04 | Fountain | Temporary | | 500157.531 | 4756152.242 | 1255 |
| SP_05 | Spring | Unknown | | 501274.005 | 4757586.971 | |
| SP_06 | Spring | Temporary | | 500663.089 | 4758584.603 | 1568 |
| SP_07 | Spring | Perennial | | 500455.717 | 4759522.008 | 1500 |
| SP_08 | Spring | Temporary | | 501599.181 | 4761609.400 | 1614 |
| SP_09 | Spring | Temporary | | 501483.752 | 4763432.964 | 1660 |
| SP_10 | Spring | Perennial | | 500925.111 | 4764647.086 | 1530 |
| SP_11 | Spring | Unknown | | 501240.976 | 4758052.033 | |
| SP_12 | Spring | Unknown | | 501755.394 | 4756599.950 | |
| SP_13 | Spring | Unknown | | 500715.579 | 4756592.013 | |
| SP_14 | Spring | Unknown | | 496517.294 | 4751047.526 | |
| SP_15 | Fountain | Perennial | | 496181.876 | 4748533.738 | 796 |
| SP_16 | Spring | Perennial | | 497768.762 | 4751614.174 | 910 |
| SP_17 | Spring | Perennial | | 499536.829 | 4755456.044 | 1178 |
| SP_18 | Spring | Perennial | | 499790.753 | 4755760.225 | 1210 |
| SP_19 | Spring | Perennial | Yes | 501124.913 | 4756690.752 | 1331 |
| SP_20 | Spring | Perennial | | 501315.357 | 4756374.934 | 1223 |
| SP_21 | Spring | Perennial | | 501816.329 | 4757105.494 | 1341 |
| SP_22 | Spring | Perennial | | 501960.219 | 4757251.501 | 1299 |
| SP_23 | Spring | Perennial | Yes | 501998.307 | 4757672.592 | 1395 |
| SP_24 | Spring | Temporary | | 501708.410 | 4760425.555 | 1509 |
| SP_25 | Spring | Temporary | | 502160.725 | 4760940.732 | 1690 |
| SP_26 | Spring | Temporary | | 501767.407 | 4761587.181 | 1662 |
| SP_27 | Spring | Temporary | | 502067.883 | 4761513.120 | 1750 |
| SP_28 | Spring | Temporary | | 502260.443 | 4761644.314 | 1641 |

| Feature ID code | Type | Flow regime | Evidence of spring use | X Coordinate (WGS84 -UTM34N) | Y Coordinate (WGS84 -UTM34N) | Elevation (m a.s.l.) |
|-----------------|----------|-------------|------------------------|------------------------------|------------------------------|----------------------|
| SP_29 | Spring | Temporary | | 501079.165 | 4762396.212 | 1634 |
| SP_30 | Spring | Temporary | | 501040.813 | 4762569.462 | 1626 |
| SP_31 | Spring | Perennial | Yes | 501396.571 | 4762533.755 | 1656 |
| SP_32 | Spring | Temporary | | 501698.899 | 4763014.624 | 1691 |
| SP_33 | Spring | Temporary | | 501949.280 | 4763238.289 | 1668 |
| SP_34 | Spring | Temporary | | 501957.743 | 4763521.838 | 1643 |
| SP_35 | Spring | Temporary | | 501875.218 | 4764040.267 | 1530 |
| SP_36 | Spring | Temporary | | 501118.887 | 4764239.220 | 1531 |
| SP_37 | Spring | Temporary | | 500874.327 | 4764683.588 | 1508 |
| SP_38 | Spring | Temporary | | 501220.729 | 4765214.449 | 1514 |
| SP_39 | Spring | Temporary | | 500890.627 | 4765373.151 | 1531 |
| SP_40 | Spring | Temporary | | 500810.218 | 4765491.648 | 1515 |
| SP_41 | Spring | Temporary | | 500522.436 | 4764956.292 | 1458 |
| SP_42 | Spring | Temporary | | 500973.357 | 4765742.187 | 1522 |
| SP_43 | Spring | Perennial | | 502166.244 | 4757765.103 | 1400 |
| SP_44 | Spring | Temporary | | 501945.960 | 4764665.184 | 1510 |
| SP_45 | Fountain | Unknown | | 502895.563 | 4757373.894 | |
| SP_46 | Spring | Unknown | Yes | 7499721.010 | 4757156.012 | |
| SP_47 | Spring | Unknown | | 7497214.022 | 4752543.133 | |
| WL_01 | Wetland | n.a. | | 501296.039 | 4757502.023 | |
| WL_02 | Wetland | n.a. | | 500946.968 | 4756659.004 | |



Figure 18: Pictures of surveyed springs and fountains. Top-left: SP_15, top-right: SP_19, bottom-left: SP_23, bottom-right: SP_31



Figure 19: Pictures of surveyed springs and fountains. Top-left: SP_17, top-right: SP_20, bottom-left: SP_22, bottom-right: SP_08

6.7.2.1 *Wind farm*

The following section provides a description of Selac wind turbines locations with respect to hydrogeological units and aquifer types reported in the Hydrogeological Map of Kosovo (scale 1:200.000).

Wind turbines comprising **Selac 1** area (**I-01** to **I-09**) are located in correspondence to **aquiclude** units comprised of metamorphic rocks.

Wind turbines comprising **Selac 2** area are located in correspondence of the following units:

- wind turbines from **II-10** to **II-13** are located in correspondence to **aquiclude** units comprised of volcanic rocks;
- wind turbines from **II-14** to **II-18** are located in correspondence to **secondary permeability aquifers** units comprised of igneous and metamorphic rocks and characterized by low to medium hydraulic conductivity;

Wind turbines comprising **Selac 3** area are located in correspondence of the following units:

- wind turbines from **III-19** to **III-25** are located in correspondence to **secondary permeability aquifers** units comprised of igneous and metamorphic rocks and characterized by low to medium hydraulic conductivity;
- wind turbines from **III-26** and **III-27** are located in correspondence to **aquiclude** units comprised of volcanic rocks.

In areas characterized by the presence of tectonic structures, such as the transition zone between **Selac 1** and **Selac 2** Wind Farm areas, local hydraulic conductivity may be increased because of the higher fracturation degree of the bedrock.

In the Wind Farm areas during geotechnical investigation no groundwater has been intercepted in drilled boreholes, that reached a maximum depth of 20 m b.g.l.

On the other hand, during field surveys, several hydrogeological features (springs, fountains and wetlands) were observed in the surroundings of the Wind Farm areas (**Figure A.5, Figure 20**):

- 24 springs are included in the 600 m wide buffer. Four of these springs show a perennial discharge regime.
- 2 wetlands are included in the 600 m wide buffer, located respectively 250 m N and 650 m S of wind turbine **I-01**.

No other hydrogeological features are reported inside the Aol in the Hydrogeological Map of Kosovo. Based on literature data and field observations, the assessed flow rate of the observed springs ranges from 0.5 l/s to 2.0 l/s. Literature data also put in evidence that springs located in the Wind Farm areas are mainly fed by **secondary permeability aquifers**, therefore they are characterized by both perennial or intermittent (temporary) regime. The latter is characterized by discontinuous discharge, reflecting the aquifer recharge pattern that depends on rainfall and snow thawing.

Most of the springs observed in the 600 m wide buffer of the Wind Farm areas show a temporary regime; based on information collected during the field survey, only four show a perennial regime. Field evidences also show that two of these springs (SP_19 and SP_31) have been intercepted by means of plastic pipes, probably for zootechnical use. Evidences of use were observed also in correspondence to a spring located outside the 600 m wide buffer (SP_23). These springs have been highlighted with a magenta coloured square in **Figure 20**.

None of the observed springs is directly overlaid by the footprint of planned structures, infrastructures and deposit areas.

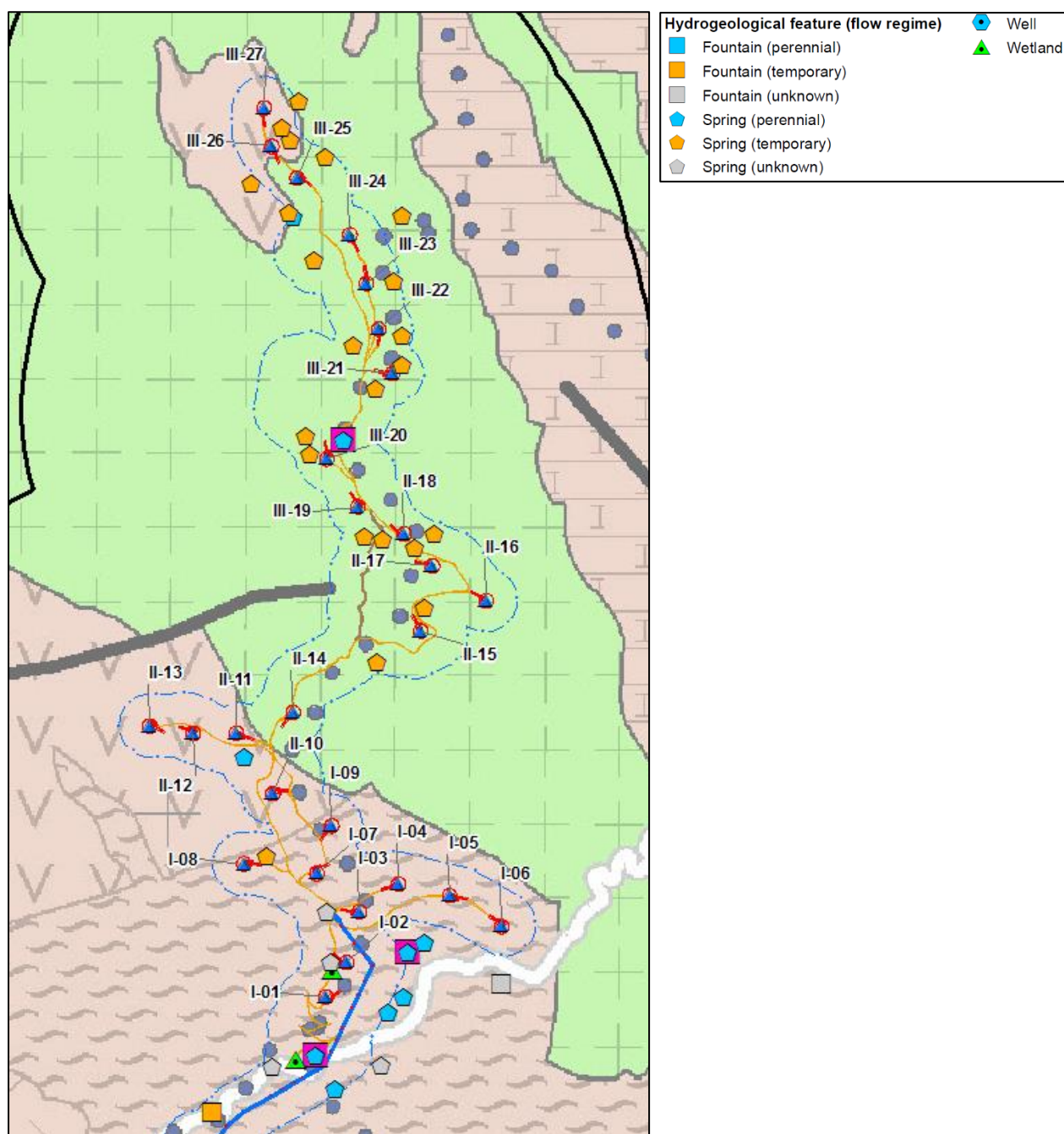


Figure 20: Extract of Figure A.5 showing the location of hydrogeological features in the surroundings of the Wind Farm areas

6.7.2.2 OHL

The following section provides a description of OHL location with respect to hydrogeological units and aquifer types reported in the Hydrogeological Map of Kosovo (scale 1:200.000).

In the mountain area the OHL is completely located in correspondence to **aquiclude** units comprised of volcanic, pyroclastic and metamorphic rocks. In areas characterized by the presence of tectonic structures, such as the transition zone between **Selac 1** and **Selac 2** areas, local hydraulic conductivity may be increased because of the higher fracturation degree of the bedrock.

In the Sitnica River plain area, between chainages 15.8 km and 17.5 km, the OHL is located in correspondence to Pliocene clastic sediments comprised of clay, sand and silt that host primary porosity aquifers with low to medium hydraulic conductivity. In the remaining part of the river plain area the OHL is located in correspondence to Quaternary fluvial deposits, mainly comprised of gravel, sand and silt. These deposits host primary porosity aquifers with medium to very high hydraulic conductivity. In this part of the Sitnica River plain area, the Hydrogeological Map of Kosovo reports the presence of confined or artesian groundwater. In the central part of Sitnica River, the succession of Quaternary deposits shows the maximum thickness. In this type of context, because of alternating fine and coarse fluvial deposits, the Quaternary succession may host a multi-layer aquifer comprised of confined and unconfined aquifer layers. No direct information about the discharge regime of observed springs and fountains is currently available.

Based on filed surveys and data reported in the OHL ESIA study, the following hydrogeological features are included in the Area of influence:

- 17 springs (including those observed in the southern part of Selac 1 area). 8 springs are included in the 600 m wide OHL buffer. 5 of these springs show a perennial flow regime.
- 5 fountains (including tapped springs). 4 fountains are included in the 600 m wide OHL buffer; two of them show a perennial flow regime;
- 4 wells (no information available about current well use). One well, close to Sitnica River, is included in the 600 m wide OHL buffer.

The following hydrogeological features are reported inside the Aol in the Hydrogeological Map of Kosovo:

- 4 undeveloped spring, with no information about water discharge;
- 2 developed mineral springs, with discharge ranging from 10 to 100 l/s, located in Sitnica River plain area;
- 1 developed spring in the mountain area;
- 1 undeveloped thermal spring (water temperature > 20°C) in correspondence to the transition zone between Pliocene clastic sediments and pyroclastic bedrock.

Comparing the spatial location of the above-listed hydrogeological features and the geological map, it is possible to observe that the majority of springs (including the thermal spring) is located in bedrock area classified as aquiclude, but in correspondence to tectonic structures and geological contacts (**Figure 21**). This evidence shows that even if no extensive aquifers are hosted in aquiclude bedrock areas, groundwater circulation is enhanced by the presence of tectonic features such as fault zones or contacts among different geological units. Consequently, fractured aquiclude bedrock may host local aquifers.

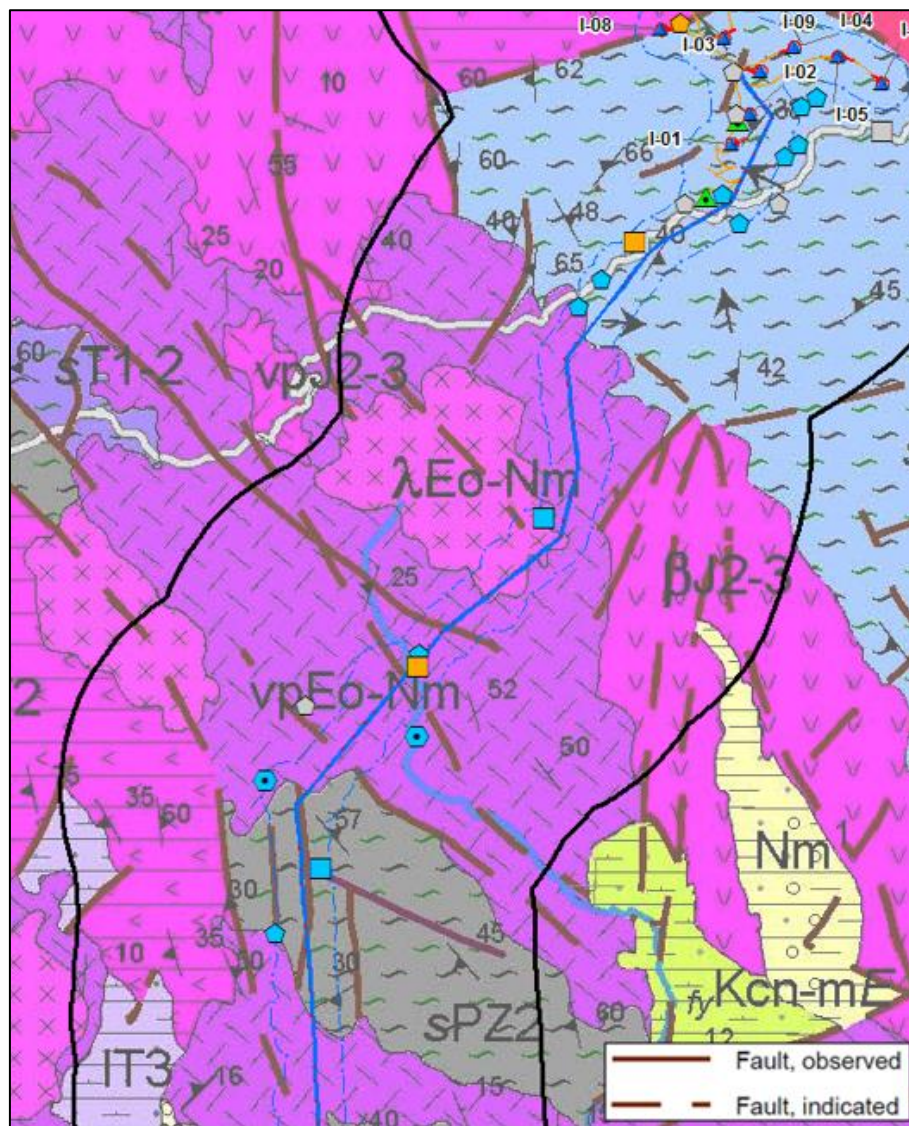


Figure 21: Location of hydrogeological features show on the Geological map of Kosovo (1:200.000 scale).

6.7.3 Sensitivity of the component

In the Wind Farm areas the following sensitivity elements were observed with regard to the hydrogeology component. Springs and wetlands located in the Wind Farm areas may contribute to sustain local flora and fauna species connected to humid habitats; after all it should be noted that local hydraulic conductivity of the bedrock is low and that most of the springs observed in the Wind Farm areas probably are not perennial. Two of the springs located in the 300 m wide buffer of the Wind Farm areas have been intercepted and probably used to supply cattle from local pastures. The sensitivity of the hydrogeology component in the Wind Farm area is estimated to be **medium**.

In the area of the OHL the sensitivity of the component is mainly defined by the presence of six springs, four fountains and one well inside the 300 m wide buffer of the OHL. Springs may be used to supply cattle from local pastures and fountains are probably used for drinking purpose. The well included in the buffer is located close to Sitnica River and is probably used for agriculture. The sensitivity of the hydrogeology component in the OHL area is estimated to be **high**.

6.8 Climate

6.8.1 Regional climate

Kosovo is a mountainous country with an average altitude of 810 m a.s.l. It is characterized by different landforms such as concave landforms where plains and mountain ranges are interlaced in a complex way, creating jigsaw landforms. Main concave landforms are surrounded by high mountains while between them there are mostly rolling and low mountains where altitude can go up to 1000 m. On the other hand, high mountains are mostly located in periphery of the country. These high mountains that define Kosovo are separated by deep river valleys and mountain passes with different orientation thus affecting channelling of air masses from all directions.

As mentioned above, the landforms of Kosovo appear to be the main factor in modifying climate conditions. Which brings us to the conclusion that changes in climatic factors such as temperature, precipitation, air pressure etc. are prevalent in altitude rather than in horizontal direction.

Impacts of air masses from the west, north and south play a major role in defining Kosovo's climatic conditions. Air masses coming from the west are mostly affected by the mountains which are parallel to the Adriatic coastline. From the northern direction air masses mainly come from valley of the Morava River and these masses are known for causing cold, dry polar and continental masses. South direction air masses come from Vardar valley.

As stated above, it can be concluded that the climate of Kosovo is predominantly continental, resulting in warm summers and cold winters with Mediterranean and Alpine influences [average temperature within the country range from +30 °C (summer) to -10 °C (winter)]. Unequal elevations in certain parts of the country make the differences in temperature and rainfall distribution.

December and January are regarded as the coldest months, July and August as the warmest months of the year. The maximum rainfall rate is reached between October and December. The months when snowfall is expected in Kosovo are between November and March, and this can occur even in the flat parts of the country. The highest snowfall rates can be expected in the mountain regions of Kosovo.

The valley between Mitrovicë/Mitrovica and Kaçanik/Kaçanik belongs to the dryer areas of the country, which at the same time corresponds to the location of the project. In contrast, the plain of Dukagjini between Pejë/Peć and Prizren is described as a very fertile area with more precipitation between November and March.

Based on the climate conditions, Kosovo can be separated into three climatic areas:

- Climatic Area of Kosovo (Rrafshi i Kosovës);
- Climatic Area of Dukagjini (Rrafshi i Dukagjinit); and
- Climatic Area of mountainous and forest parts.

The climatic area of Kosovo (Rrafshi i Kosovës), where also the Project area is located, includes the Iber-Valley and is influenced by continental air masses. For this reason, in this part of the country, the winters are colder with medium temperatures above -10 °C, but sometimes down to -26 °C. The summers are very hot with average temperatures of 20 °C, sometimes up to 37 °C. This area is characterized by a dry climate and a total annual precipitation of 600 mm per year, approximately.

When it comes to wind, the western Balkans region are well known for the local winds such as Koshava, Bura and Vardarec, but none of these winds has significant effect on the climatic conditions of Kosovo. Bura is an eastern cost wind coming from Adriatic region but doesn't affect Kosovo. Koshava on the other hand is a north-eastern wind with big influence in thermal conditions in Serbia while only in extreme cases can reach the north-

eastern part of Kosovo. Vardar wind is a local wind formed in the central parts of the Balkans and moving southwards to the Aegean Sea.

6.8.2 Local climate

Expectable weather conditions during constructions at Selac site are reported in a Brief Report prepared by NOTUS (Project Selac – Weather Conditions, 08.08.2019). Based on MET mast and model data, the weather conditions are monthly evaluated.

Mean long-term temperature are below zero from December to March. Mean relative humidity is high during the whole year. Thus, icing periods are favourable from December to March. The other part of the year, temperatures above zero are expected with a maximum in August. Higher relative humidity is present during the whole year. It cannot be determined whether this is due to low hanging clouds or fog. Additionally, model data of a swiss meteorological service named meteoblue were considered. The same months with common temperatures below freezing were found, but relative humidity is only available in 2 m above height with in total slightly lower mean values. Snow is favourable between October and April.

Capturing the wind conditions, two MET mast (Selac 1 and Selac 2) and other remote sensing devices are installed on site. In addition to wind measuring devices, thermometer and hygrometer are attached in several heights. In **Figure 22** device locations are reported.

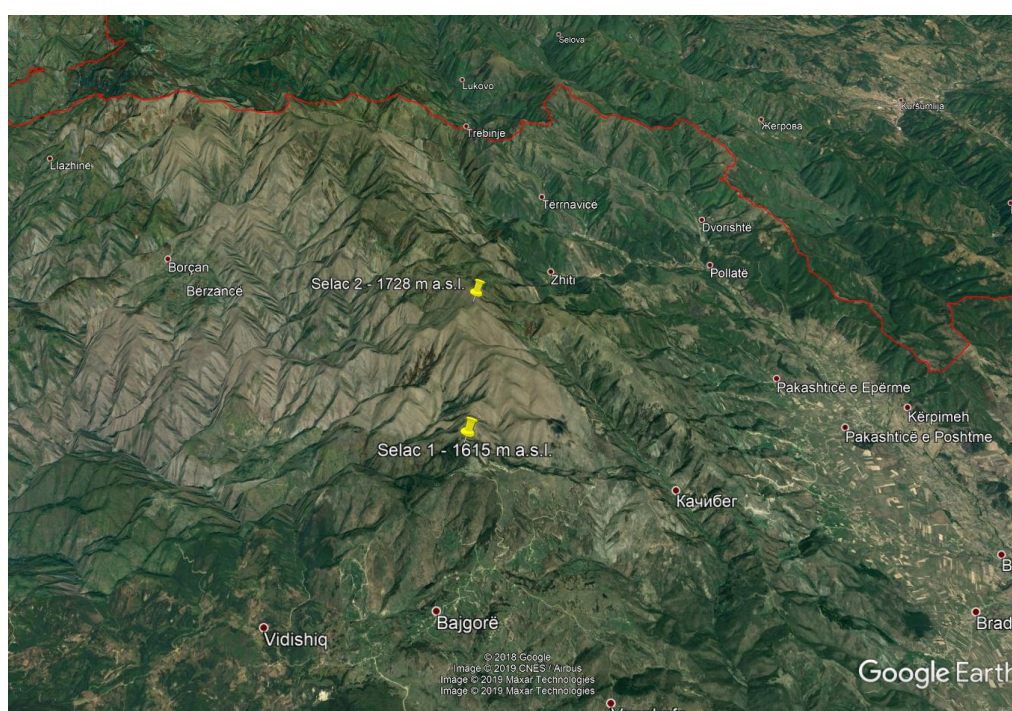


Figure 22: Measurement sites of Selac 1 and Selac 2, with terrain height above sea level is illustrated. Viewing direction north.

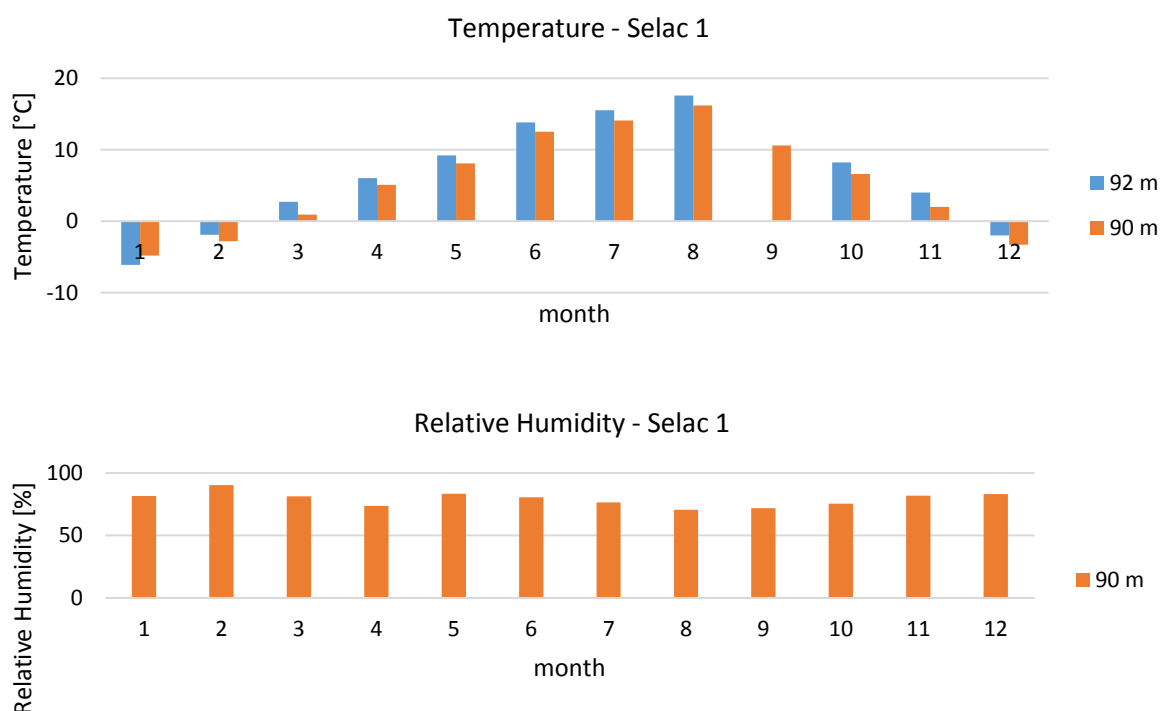
Measurement campaigns of MET masts started in 2016 and 2017 (see **Table 5**). The data availability is low due to icing events, lightning events, and device malfunctions. Especially during winter season, huge data gaps are present.

Table 5: Overview of analysed measurement devices with terrain height above sea level, official measurement period and gross data availability.

| | Measuring Device | Terrain Height above sea level [m] | Official Measurement Period | Gross Data Availability (State: 16.07.2019) [%] |
|---------|------------------|------------------------------------|-----------------------------|---|
| Selac 1 | MET Mast | 1.615 | 28.10.2016 – ongoing | 60 |
| Selac 2 | MET Mast | 1.728 | 09.08.2017 - ongoing | 40 |

At Selac 1 site, mean temperatures are below zero for December to February (**Figure 23**). In combination with high mean relative humidity, icing is favourable during that months. Temperatures above zero are present between March and November for the measurement period.

At Selac 2 site data availability is low during winter season (**Figure 24**). Thus, no statement of icing conditions can be given for January and February. It can be assumed that icing conditions were present which causes the malfunctions of the measuring devices. As at Selac 1, temperatures are above zero for all other seasons except in the winter seasons.

**Figure 23: Mean temperature and relative humidity for each month for several heights at Selac 1 site.**

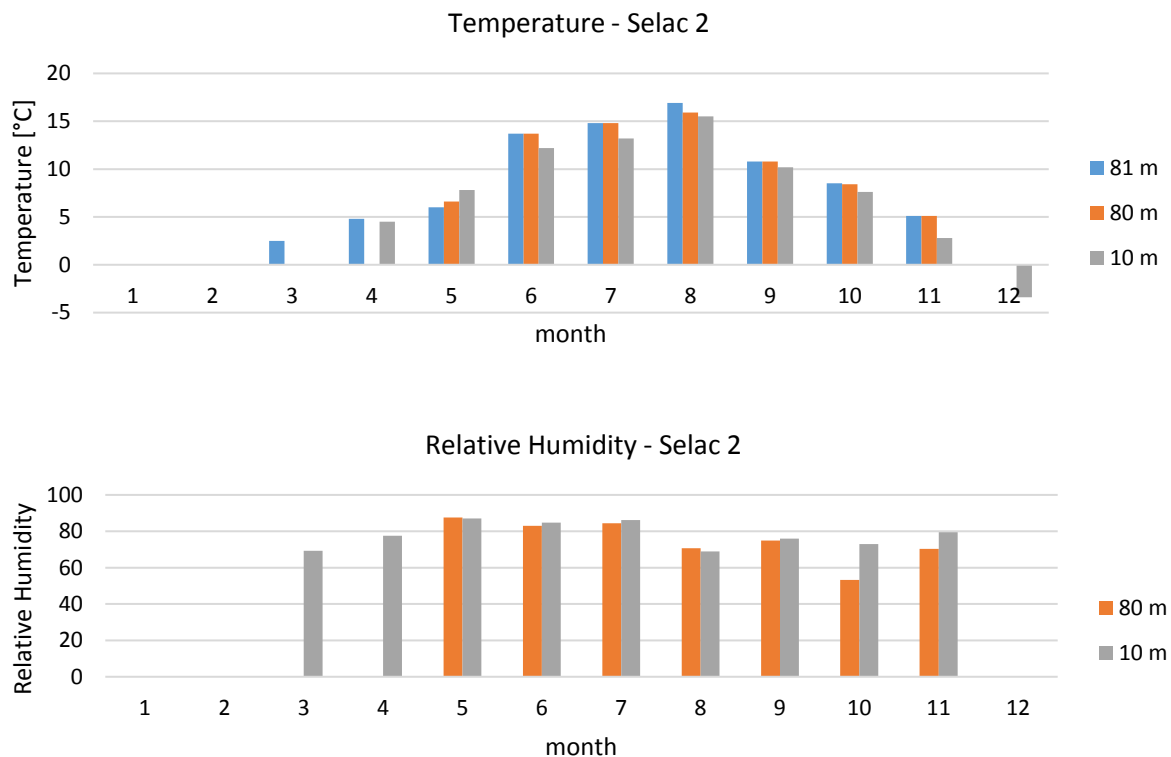


Figure 24: Mean temperature and relative humidity for each month for several heights at Selac 2 site.

MET mast data only represent the measurement period. This period can be a strong or weak wind/temperature period which results in an over - or underestimation of the data.

Thus, measured data are set in long-term relation with model data (here: MERRA 2). Data of temperature in 50 m above ground were available for the analysis. Due to complex terrain, MERRA data only fit partially to measured data (**Figure 25**). However, tendencies whether a strong or weak temperature month is present, based on long-term mean temperatures (1996 to 2018) can be extracted and applied on the on-site measurements.

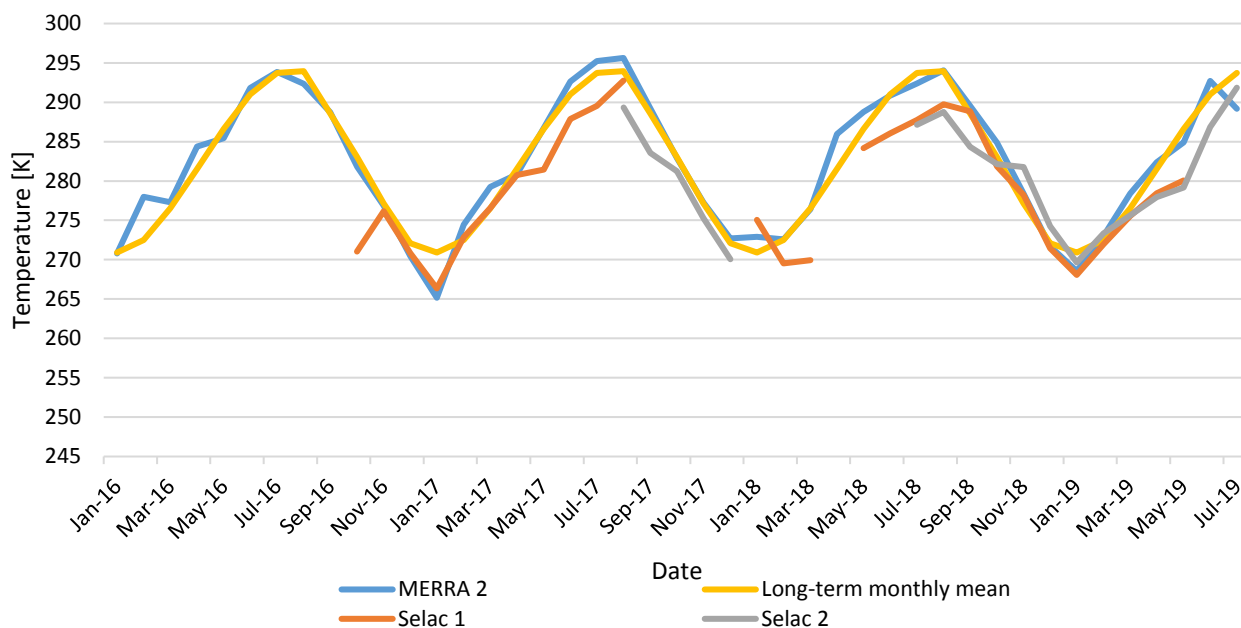


Figure 25: Comparison of temperature data of MERRA 2, Selac 1, and Selac 2. Additionally, the long-term monthly mean (1996 – 2018) is given.

In the following, long-term related temperatures with MERRA 2 are presented (**Figure 26** and **Figure 27**). The long-term correction results in mean temperatures below zero in March at site Selac 1. Temperatures of other month only changed slightly for both sites.

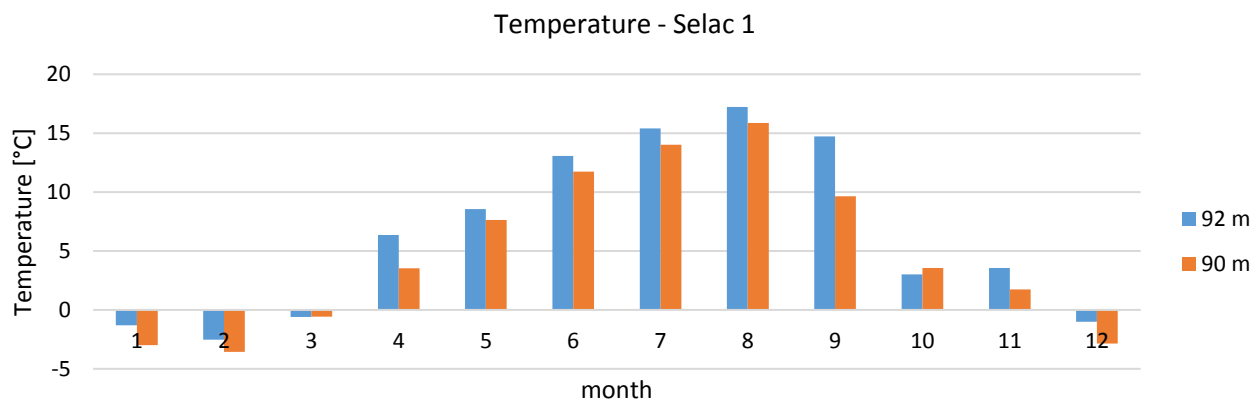


Figure 26: Long-term mean temperature for each month for several heights at Selac 1 site.

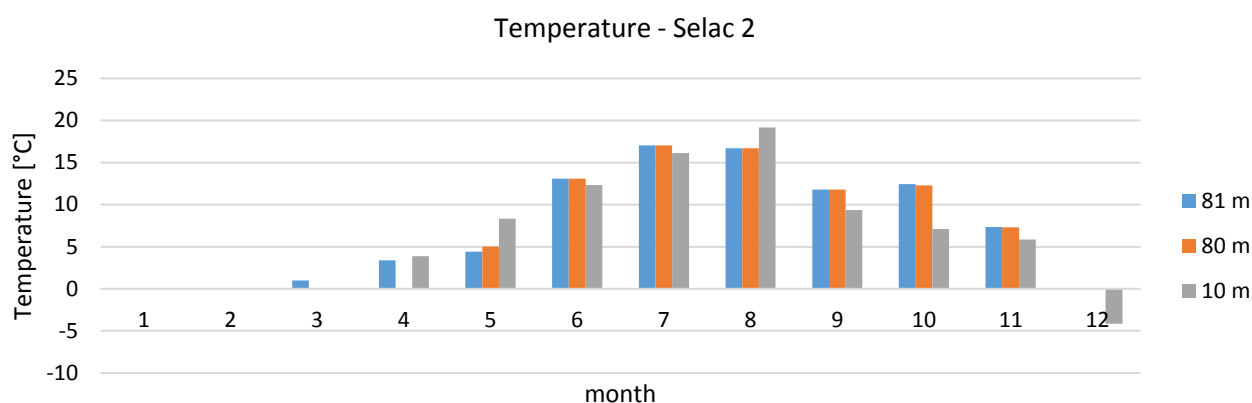


Figure 27: Long-term mean temperature for each month for several heights at Selac 2 site.

Meteoblue is a swiss meteorological service. The model consists of nonhydrostatic meso-scale modelling with a special resolution of 4 to 30 km. Output parameters are temperature (2 m above ground), relative humidity (2 m above ground), pressure (at sea level), precipitation amount, total cloud cover, low, mid high cloud cover, solar radiation, Wind speed and direction (10 m), Wind speed and direction (80 m), wind speed and direction (900 hPa), and wind gust (10 m). Data for every location on earth are available for 30 years.

Model data are available for location Bajrak, right next to the site (43.019°N, 21.017°O, 1776 m a.s.l.).

Model data (temperature and relative humidity at 2 m above ground and snowfall amount) of meteoblue are analysed for the period of 1985 to 2018 (34 years).

Mean temperatures are below zero for December to March with a minimum of -25.01 °C in January 2017 (**Figure 28**). In comparison, Selac 1 had -24.80 °C at 90 m height at the same time. Mean relative humidity is still high but due to a lower height slightly smaller (**Figure 29**). Snow falls between October and April with a maximum snowfall amount in January (**Figure 30** and **Figure 31**). Next to snowfall, snow can be accumulated by drift.

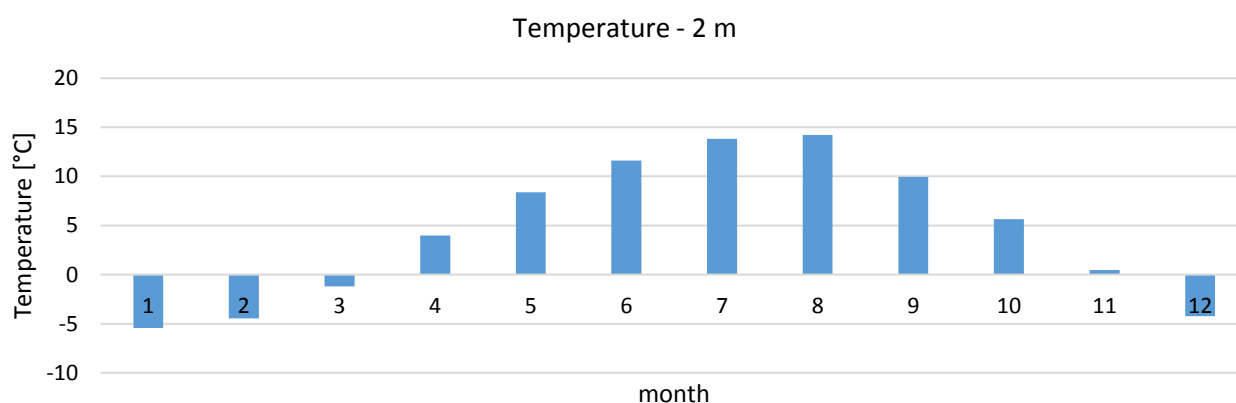


Figure 28: Annual circle of mean temperature (2 m above ground) based on meteoblue model data (1985 – 2018).

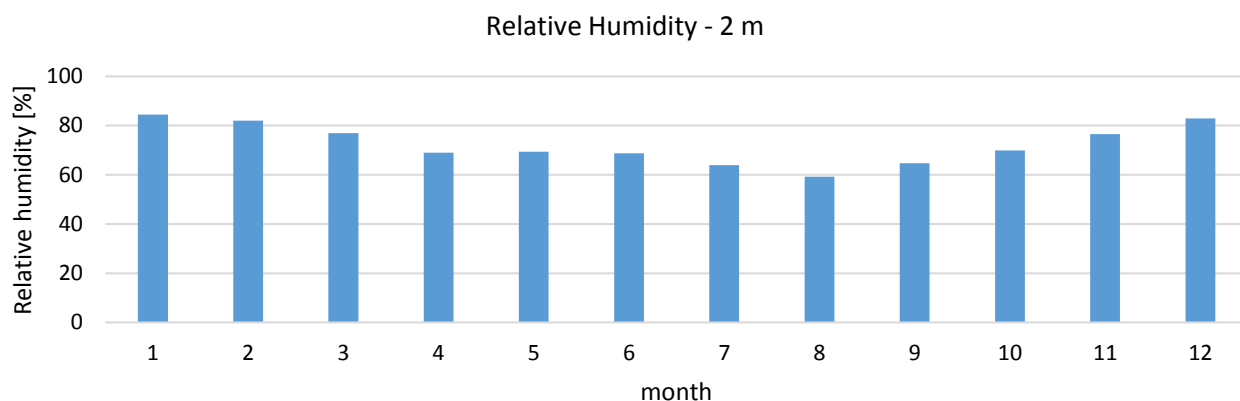


Figure 29: Annual circle of mean relative humidity (2 m above ground) based on meteoblue model data (1985 – 2018).

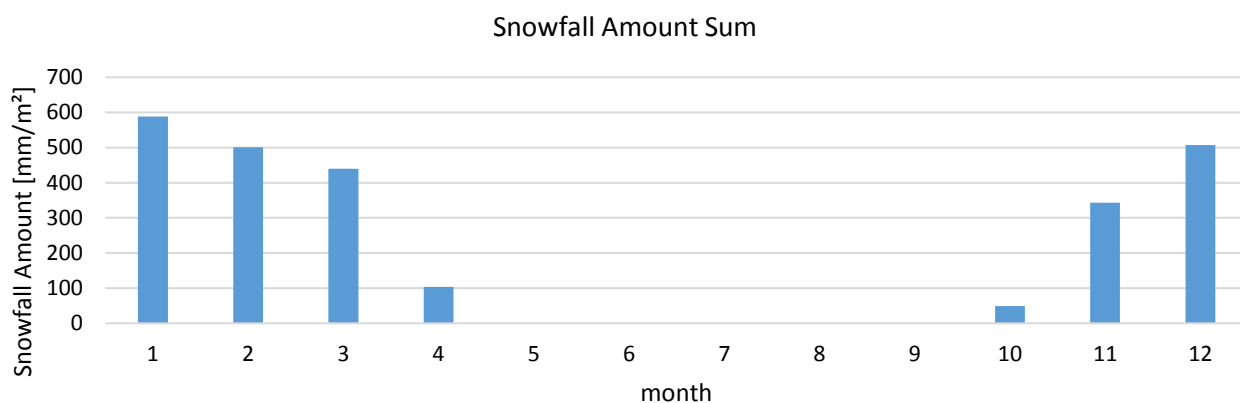


Figure 30: Aggregation of snowfall amount each month based on meteoblue model data (1985 – 2018).

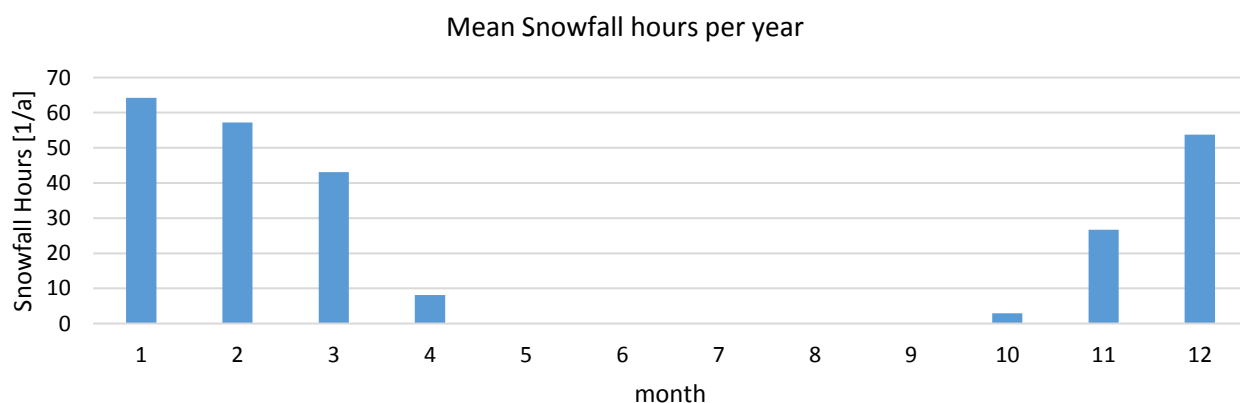


Figure 31: Annual circle of yearly snowfall hours based on meteoblue model data (1985 – 2018).

6.8.3 Sensitivity of the component

The following list presents potential sensitivity features to be considered in defining the sensitivity of this component:

- The project area is characterized by an extreme climate (semi-desert, sub-arctic, etc.) and/or by a high frequency of extreme events (tornadoes, floods, droughts, etc.).
- There is evidence of the effects of climate change within the project area of influence.
- The Project area has a limited ability to adjust to climate change.

In Wind Farm and OHL areas no main features contributing to the sensitivity of the component are detected. The sensitivity of the climate change component is estimated to be **very low**.

6.9 Air quality

6.9.1 Results of the desktop study

A desktop study has been carried out to define the regional and local air quality current conditions, according to the following steps:

- Emission sources and pollutants of concern. The development of the emission inventory is aimed at identifying relevant emission sources and associated emissions;
- Air Quality Standards (AQS). In force AQS represent the benchmark for assessing local air quality conditions. At the national levels are based on the Administrative Instruction No. 02/2011. Moreover, international organizations, such as the IFC and the World Health Organization (WHO), have developed an extensive body of legislation which covers a wide range of pollutants and establishes air quality standards for the protection of human health and vegetation; and
- Sensitive receptors/areas. Human and environmental receptors close enough to undergo potential adverse impacts.

As reported in the most recent “Annual Report on the state of the Environment in Kosovo” (Ministry of Environment and Spatial Planning and Kosovo Environmental Protection Agency, 2015) air quality reflects the situation for the territory of Kosovo based on measurements from continual air quality monitoring stations. The source of data is mainly monthly reports, which present data recorded from stations under the management of IHMK (“Hydrometeorological Institute of Kosovo”).

Two stations are located in Pristina and are representative of air quality on the urban background (Rilindja) and the suburban background (IHMK), while other 6 stations, located in Mitrovica, Drenas, Peja, Prizren, Hani i Elezit and Gjilan are representative for urban background air quality and the station located in Brezovica is for the rural background. At last 3 industrial background stations are in the KEK area (Dardhishte, Palaj and Obiliq – **Table 6**).

Table 6: Air quality monitoring stations

| Nr. | Name of the monitoring station | Code of the station | Location | Responsible authority | Measured parameters | Type of the area |
|-----|--------------------------------|---------------------|-------------------------------------|-----------------------|--|------------------|
| 1 | IHMK | KS0101 | IHMK, Prishtinë | IHMK | PM10, PM2.5, SO ₂ , NO _x , O ₃ , CO | Urban |
| 2 | Rilindja | KS0102 | Backyard of Rilindja, Prishtinë | IHMK | PM10, PM2.5, O ₃ | Urban |
| 3 | Pejë | KS0305 | Primary School "Lidhja e Prizrenit" | IHMK | PM10, PM2.5, SO ₂ , NO _x , O ₃ , CO | Urban |
| 4 | Prizren | KS0406 | Municipal building | IHMK | PM10, PM2.5, SO ₂ | Urban |
| 5 | Brezovicë | KS0507 | Skiing area | IHMK | PM10, PM2.5 | Urban |
| 6 | Hani i Elezit | KS0508 | Primary School "Ilaz Hallaqi" | IHMK | PM10, PM2.5, SO ₂ , NO _x , O ₃ , CO | Urban |
| 7 | Gjilan | KS0609 | Municipal building | IHMK | PM10, PM2.5, SO ₂ , NO _x , O ₃ , CO | Urban |
| 8 | Drenas | KS0103 | Municipal building | IHMK | PM10, PM2.5, SO ₂ , NO _x , CO | Urban |
| 9 | Obiliq | KS0110 | Family Health Centre | IHMK | PM10, PM2.5, SO ₂ , NO _x , O ₃ , CO | Urban |
| 10 | Dardhishtë | KS0111 | Primary school | IHMK | PM10, PM2.5, SO ₂ , NO _x , O ₃ , CO | Industrial |
| 11 | Palaj | KS0112 | Kosova Mont | IHMK | PM10, PM2.5, SO ₂ , NO _x , O ₃ , CO | Industrial |
| 12 | Mitrovicë | KS0204 | Meteorology station | IHMK | CO, O ₃ , PM10, PM2.5 | Urban |

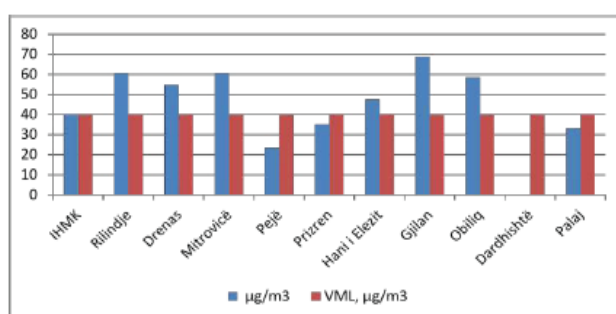
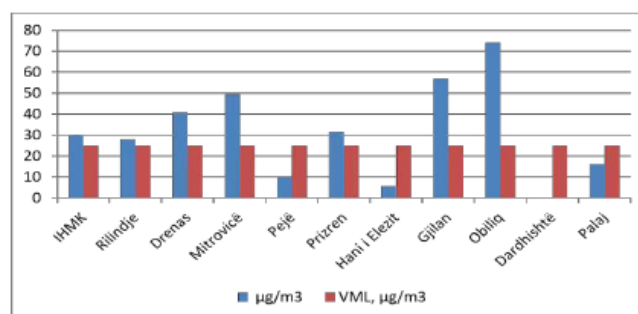
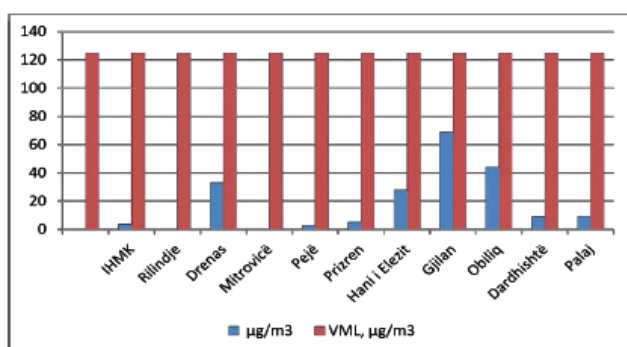
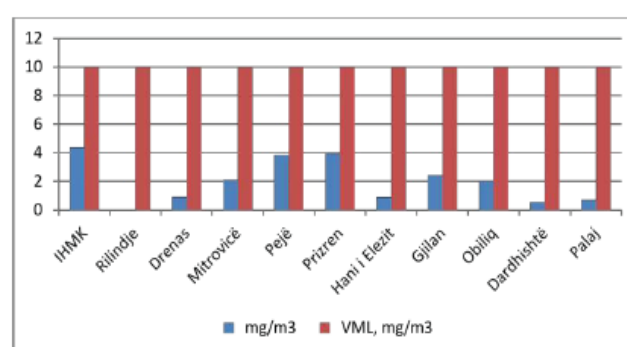
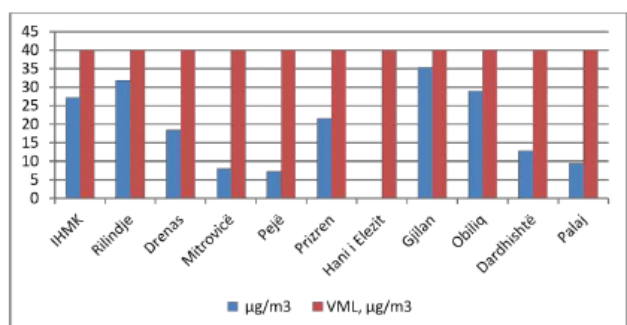
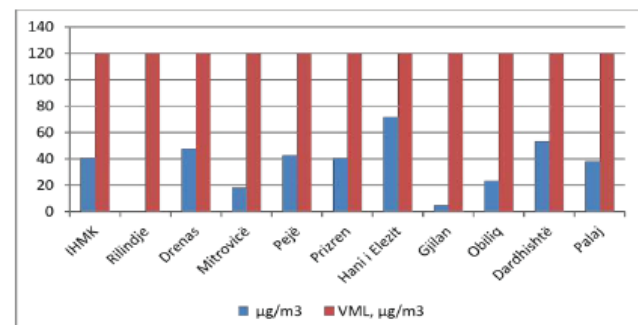
The report includes the average monthly values from the results of the air quality monitoring system at the national stations network. It should be noted that there were no continuous data from some monitoring stations and this makes it difficult to estimate the overall condition of the air.

The air quality standards based on which the assessment was made are based on the Administrative Instruction No. 02/2011 (Table 7).

Table 7: Air quality standards according to the Administrative Instruction No. 02/2011

| Parameters | Limit values | Units of measure | Limit values $\mu\text{g}/\text{m}^3$ | Rate of allowed exceedance in a year |
|-------------------|---|--------------------------|---------------------------------------|--------------------------------------|
| NO ₂ | Limit value for 1 hour for the protection of human health | $\mu\text{g}/\text{m}^3$ | 200 | 18 |
| | Annual limit value for the protection of human health | $\mu\text{g}/\text{m}^3$ | 40 | Not foreseen |
| | Annual limit value for the protection of vegetation | $\mu\text{g}/\text{m}^3$ | 30 | Not foreseen |
| SO ₂ | Limit value for 1 hour for the protection of human health | $\mu\text{g}/\text{m}^3$ | 350 | 24 |
| | Limit value for 24 hours for the protection of human health | $\mu\text{g}/\text{m}^3$ | 125 | 3 |
| CO | Limit value for the 8-hour daily average for the protection of human health | mg/m^3 | 10 | Not foreseen |
| PM ₁₀ | Limit value for 24 hours for the protection of human health | $\mu\text{g}/\text{m}^3$ | 50 | 35 |
| | Annual limit value for the protection of vegetation | $\mu\text{g}/\text{m}^3$ | 40 | Not foreseen |
| PM _{2.5} | Annual limit value for the protection of vegetation | $\mu\text{g}/\text{m}^3$ | 25 | Not foreseen |
| O ₃ | Long-term objective for the protection of human health | $\mu\text{g}/\text{m}^3$ | 120 | Not foreseen |
| | Information threshold | $\mu\text{g}/\text{m}^3$ | 180 | Not foreseen |
| | Alarm threshold | $\mu\text{g}/\text{m}^3$ | 240 | Not foreseen |

According to the measurements carried out by 2015 air network monitoring stations, significant pollution is observed from dust in the form of PM₁₀ and PM_{2.5} (**Figure 32** and **Figure 33**), while other parameters do not exceed the Maximum Allowed Value (“VML” - **Figure 34-37**).

Figure 32: Annual average of PM₁₀ in 2015Figure 33: Annual average of PM_{2.5} in 2015Figure 34: Annual average of SO₂ in 2015Figure 35: Annual average of CO₂ in 2015Figure 36: Annual average of NO₂ in 2015Figure 37: Annual average of O₃ in 2015

A more recent study (2019) highlights a decline of Kosovo air quality in the last few years. An infographic from BIRN's ("Balkan Investigative Reporting Network") own monitoring team illustrates the dangers of this phenomenon.

Official air quality measurements have been conducted by the Hydrometeorological Institute of Kosovo and have published their recent findings on the website kosovo-airquality.com, which includes measurements from eight different locations across the territory of Kosovo.

However, the measurements were initially made by the American Embassy in Kosovo, who use their own air quality monitors that measure the air from the Embassy in Albania.

In the meantime, two more air quality monitors were installed in Prishtina as a response to the alarming air quality levels recorded by the Embassy.

Figure 38 shows the points where the measurements and relevant air quality values of these measurements were made. These values are known as the Air Quality Index. This index calculates the micrograms per cubic

meter of 5 air pollutants, specifically carbon monoxide, ozone, sulphur dioxide, nitrogen dioxide and particulate matter “PM”.

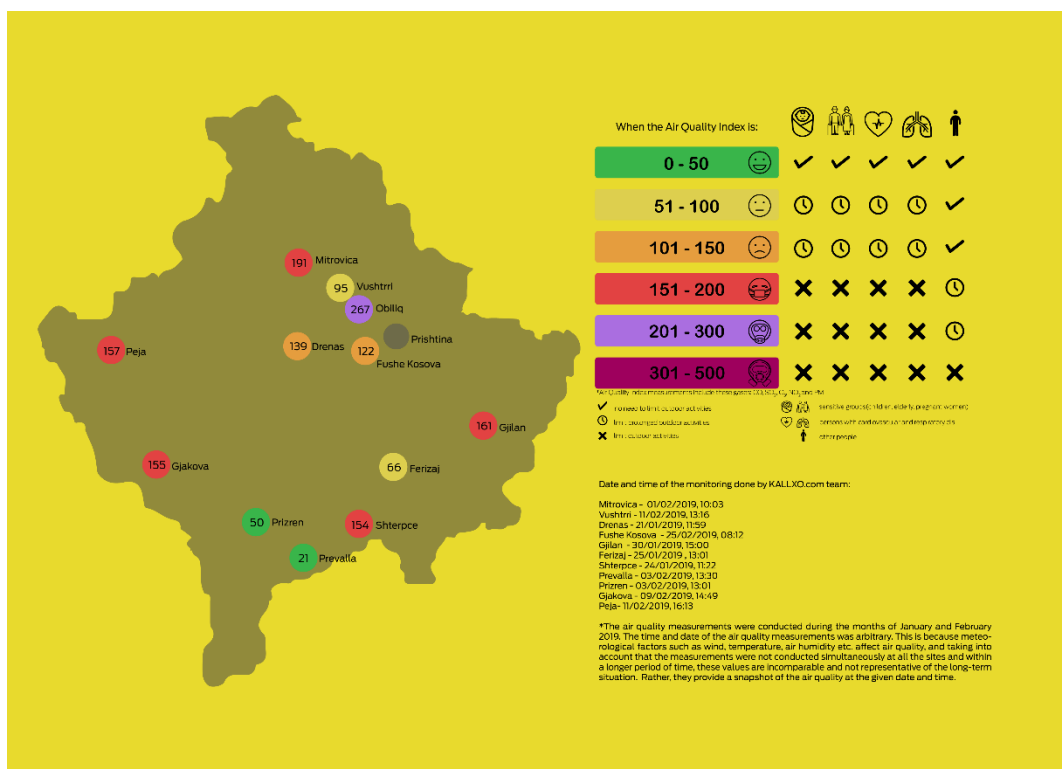


Figure 38: Air Quality Index (Infographic: Lira Ramadani/BIRN)

The OHL will start 2 km north of the city of Vushtrric, that is a moderate polluted area according to Air Quality Index in Figure 34. Then the Project will develop in a wider region, far from any high impacted area and emission source; the location of the wind farm is indeed on peripheral and unused land.

Currently there are no measured parameters in this area, but here the air quality is supposed to be good, without any industrial source of pollution, except for local air pollution situations, originate from uncovered waste sites that people burn in irregular intervals or use these wastes to heat their homes.

6.9.2 Results of field measurements

An important aspect to underline is represented by the potential presence of natural occurring asbestos in Wind Farm area (§ **Figure 9**). Indeed, according to the local geological description (6.4.2 Local geology) part of the area is characterised by the presence of potential asbestos bearing rock. Moreover, in areas with serpentinized ultramafic rocks, asbestos may be included not only in the bedrock rock mass, but also in Quaternary eluvial-colluvial deposits formed by its weathering and erosion.

Preliminary analysis, carried out during early works on rock samples collected in correspondence to wind turbine **II-14**, confirmed the presence of natural occurring asbestos in serpentinized ultramafic rock. The presence of natural occurring asbestos could be a potential health risk connected to the dispersion of airborne asbestos fibres.

Baseline investigations were carried out in order to define the presence and the concentration of natural asbestos fibres in the air in correspondence to some locations of the Wind Farm areas. Sampling locations were selected according to the following rationale:

- 2 sampling locations located inside the area where natural occurring asbestos rocks are expected;

- 1 sampling location located outside the area where natural occurring asbestos rocks are expected;
- 1 sampling location located close to the boundary of the geological unit **σJ2-3**, where the presence of natural occurring asbestos rocks is uncertain. In detail the area of wind turbines **II-12** and **II-13** was selected.

Air sampling were carried out in absence of any potential interference from anthropic activities (e.g. construction works, vehicular traffic, handling/transport of materials). In correspondence to each location sampling events have been carried out per day, in order to obtain background data of airborne asbestos fibres concentration (expressed as f/l or f/cm³ or f/m³) over a 24 hours period. **Figure 39** shows the location of baseline air sampling points.

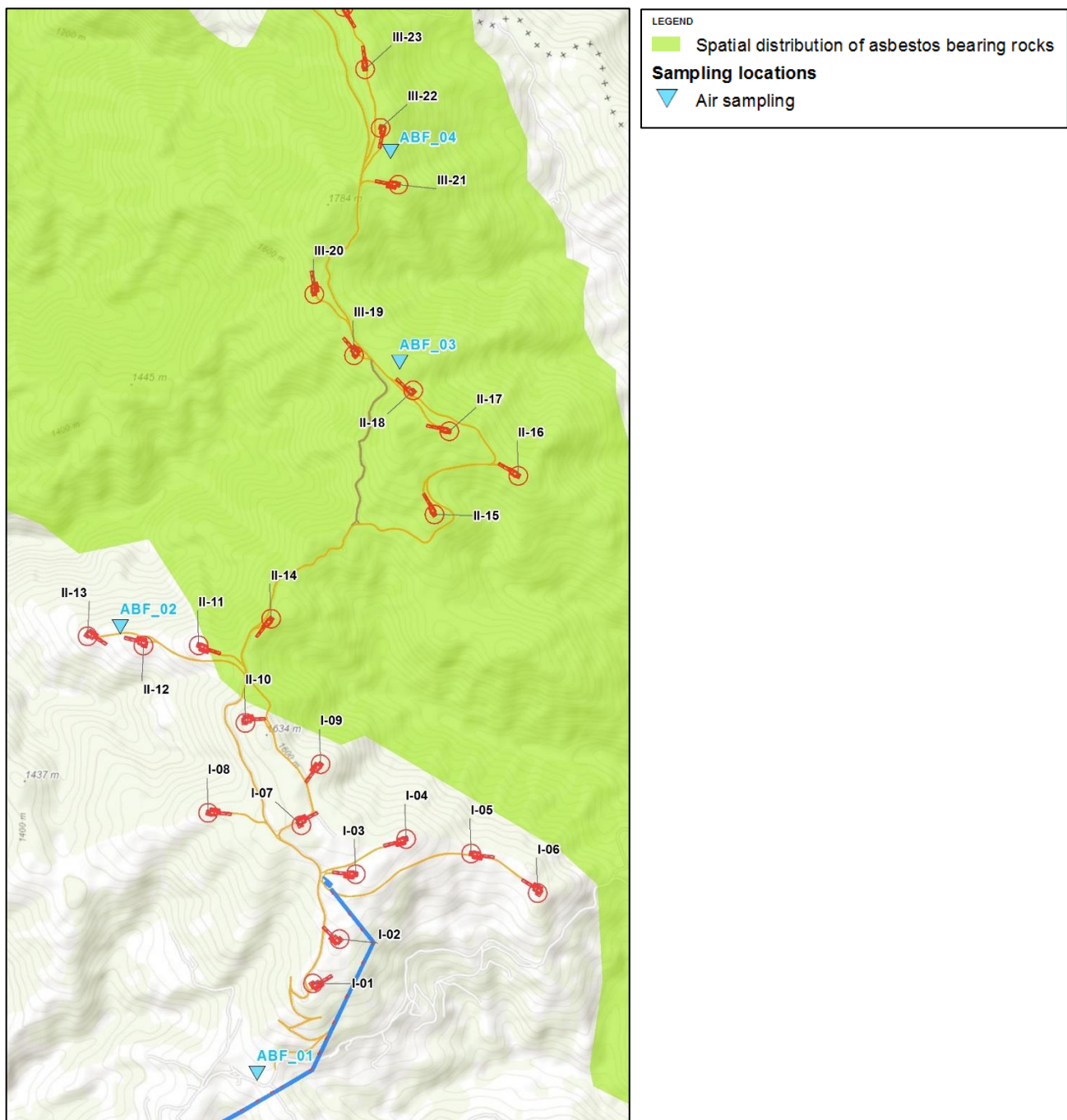


Figure 39: Location of air baseline sampling points

No asbestos fibres in air have been detected in 3 sampling filters analysed (ABF_01, ABF_03 e ABF_04). Results of analysis for sample ABF_02 are not yet available and will be provided in the next submission of the report.

6.9.3 Sensitivity of the component

The following list presents potential sensitivity features to be considered in defining the sensitivity of this component:

- Presence of settlements and population potentially exposed to air emissions from the project; the sensitivity increases with the number of people exposed;
- Presence of vulnerable targets (schools, hospitals, retirement houses, etc.) exposed to air emissions from the project; the sensitivity increases with the number of vulnerable people exposed;
- Presence of sensitive ecological receptors like protected or classified areas, protected or endangered habitats and species;
- Air quality levels in the areas affected by the project; the sensitivity increases in areas already polluted and in areas designated for air quality protection;

Considering the last criterion, it should be noted that in the wind farm area there is potential source of airborne asbestos fibres due to the local geology. Even if the analysis conducted to date did not show measurable fibres concentrations in the air, the presence of naturally occurring fibres cannot be excluded. This situation occurs inside and close to the boundaries of the geological unit **σJ2-3** (see section 6.4.2.1) where natural occurring asbestos rocks are present. Given the potential health risk connected to the dispersion of airborne asbestos fibres the sensitivity of the air quality component in the Wind Farm area is estimated to be **very high**.

In the Wind Farm area outside the boundary of the geological unit **σJ2-3** where natural occurring asbestos rocks are not expected and in OHL area, the main feature contributing to the sensitivity of the component is represented by presence of small settlements and few people potentially exposed to dust emissions from the project during construction and decommissioning phases. The sensitivity of the air quality component in the OHL area is estimated to be **medium-low**.

6.10 Noise and vibrations

6.10.1 Results of the desktop study

A desktop study was carried out in the scope of ESIA (April 2019), highlighting that no data were available to determine ambient noise levels, therefore it was necessary to undertake a field survey and define existing noise levels to support the ESIA study. The results of these activities are presented in the Noise Monitoring Report in Appendix to the ESIA.

The main objective of the Noise Monitoring is to measure the ambient noise level at different locations, to characterise the current acoustic climate of the area through a specific phonometric survey, making comparisons against regulatory Noise Standard applicable to the activity.

The scope of a noise survey is to perform following activities:

- The measurement of the ante operam noise level to establish the pre-existing background noise levels in the interested area as well at the property fence and to nearest sensitive receptors;
- The identification of potential critical issues for sensitive identified receptors.

Before starting field activities, a desktop study was carried out to define the following steps for site characterisation:

- Emission sources. Identification of the type and number of noise sources based on actual facility design and information about related activities and on current anthropogenic noise on site related to agricultural, domestic activities and emission from vehicles on roads;
- Noise Standards (NS). In force NS represent the benchmark for assessing local noise levels. International references, such as IFC Noise Levels Guidelines were considered.
- Sensitive receptors/areas. Noise monitoring might be finalized at monitoring noise levels in the near proximity of potentially affected communities located close enough to undergo potential adverse impacts. A comprehensive map of sensitive receptors within the OHL and WF AoI was produced at this stage to support the monitoring site selection. Sensitive receptors identified included domestic premises, temporary housing accommodation, animal rearing farms, hotels, hospitals, cultural heritage sites and schools within 500 m from the OHL and WF footprint

6.10.2 Results of field measurements

In June 2019, a specific phonometric survey was carried out by GR Albania for the identified sensitive receptors of the Wind Farm (WF) and OHL areas. A complete description of the applied procedures, field activities and results are included in the Appendixes Section of the present ESIA.

The monitoring process was performed for 4 most sensitive receptors of the WF and 5 most sensitive receptors for the OHL area of the project. These receptors are indicated in the maps included in the Noise Monitoring Report in appendix to the present ESIA.

Hired and trained environmental experts were responsible for the noise measurements while a community representative was on site to help the engineers identify and gain agreement of land holders and users ahead of noise monitoring activities.

Sensitive receptors were considered as any domestic premises, temporary housing accommodation, animal rearing farms, hotels, hospitals, cultural heritage sites, etc. within 500m or less from the construction site and access road due to noise of vehicle movements.

The equipment used for the baseline noise measurements (sound level meter and field calibrator) is subject to annual verification by an accredited laboratory. The sound level meter was checked with a calibrator before and after each measurement to ensure that no significant drift in calibration has occurred during the duration of the measurement.

During the baseline noise monitoring, there were no construction activities near the noise monitoring stations. Noise measurements were not performed in the presence of fog and rain.

Noise monitoring at WF lasted 24 hours while 3 diurnal measures of 15 minutes each one were performed for the receptors of the OHL.

6.10.2.1 Wind Farm

Comparing the daytime monitoring results of the sensitive monitored receptors with the Threshold limit of LAeq which is 55 Db (A), all the receptors are within the limit set out by the above-mentioned Guidelines.

Comparing the night-time monitoring results of the sensitive monitored receptors with the Threshold limit LAeq which is 45 dB(A), all the receptors are within the limit except of the receptor coded as RL 10 with a result of 52.2 dB(A), exceeding the limit with a 7.2 dB(A). The same receptor as per the daytime monitoring result, results within the daytime allowed value but still close to it too, with a result of 54.9 dB(A) compared to the limit of 55 dB(A).

6.10.2.2 OHL

Comparing the noise monitoring results of the sensitive monitored receptors with the Threshold limit of LAeq which is 55 Db (A), all the receptors are within the limit set out by the above mentioned Guidelines except of Receptor T-10 which is close to Vushtrri with a difference of 5 to 8 Db (A) more than the allowed norm. The results of the receptor T-10 were expected to be higher as it is a residential area.

6.10.3 Sensitivity of the component

The following list presents potential sensitivity features to be considered in defining the sensitivity of this component:

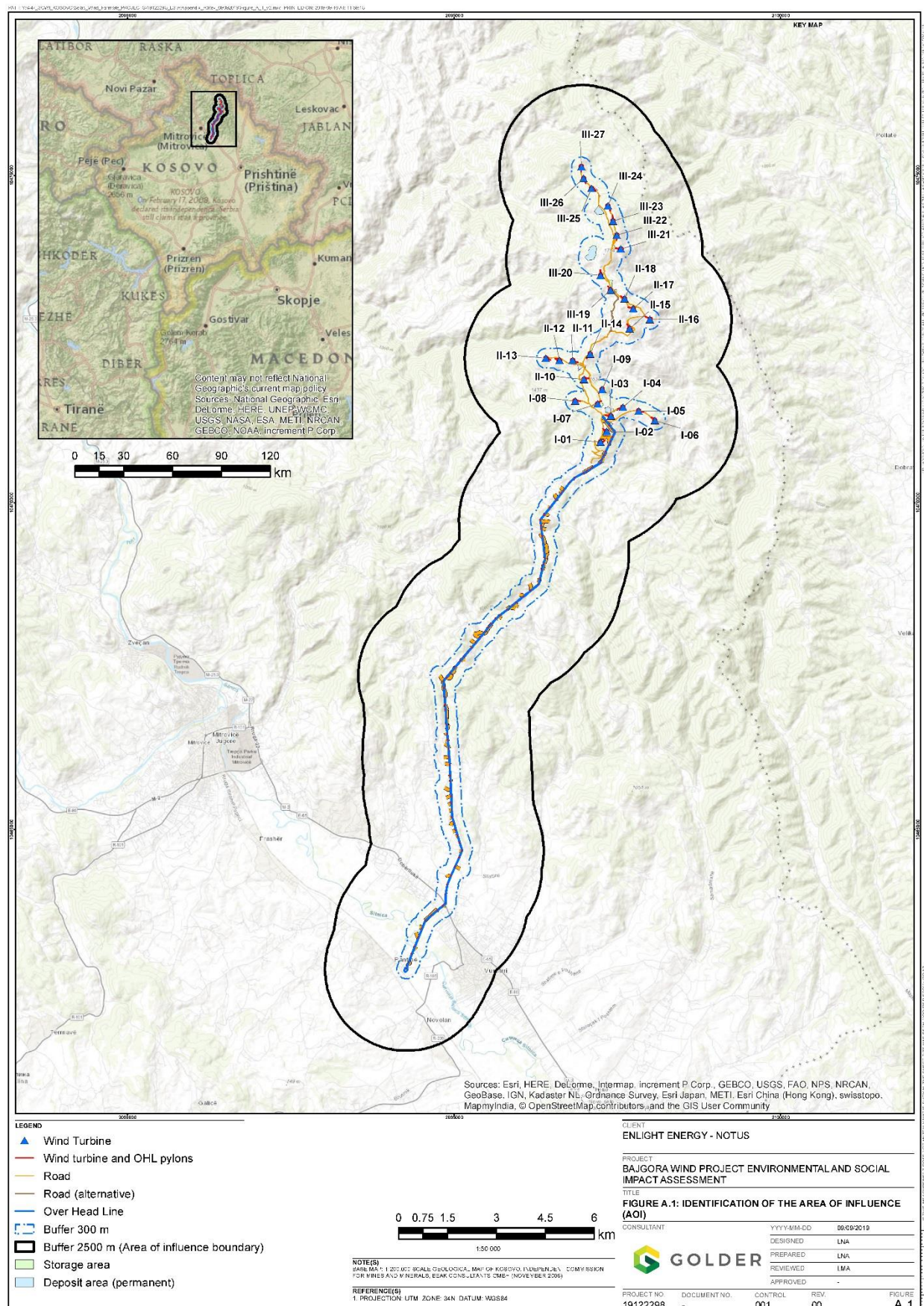
- Presence of settlements and population potentially exposed to noise and vibration from the Project; the sensitivity increases with the number of people exposed;
- Presence of sensitive receptors exposed to noise and vibration from the project; the sensitivity increases with the number of vulnerable people exposed;
- Noise and vibration levels and/or sources in the areas affected by the project; the sensitivity increases in areas already experiencing high levels of noise and vibrations and in areas designated for protection from noise and vibrations;
- Presence of sensitive ecological receptors like protected or classified areas, protected or endangered habitats and species.

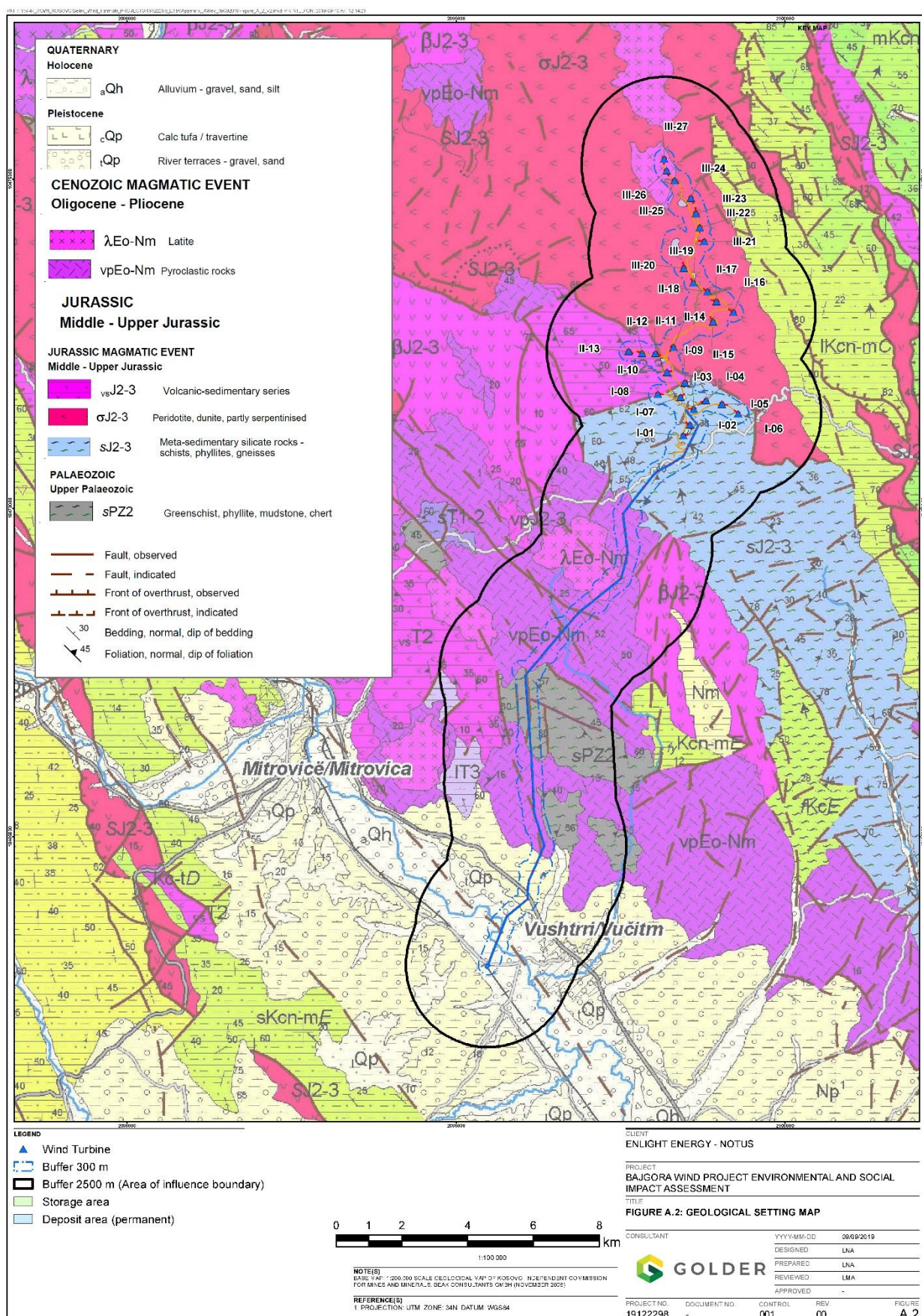
In the Wind Farm area the main feature contributing to the sensitivity of the component is represented by the presence of settlements and population potentially exposed to noise and vibration from the project during operational phase as well as the presence of sensitive ecological receptors like protected or endangered habitats and species. The sensitivity of the noise component in the Wind Farm area is estimated to be **medium-high**.

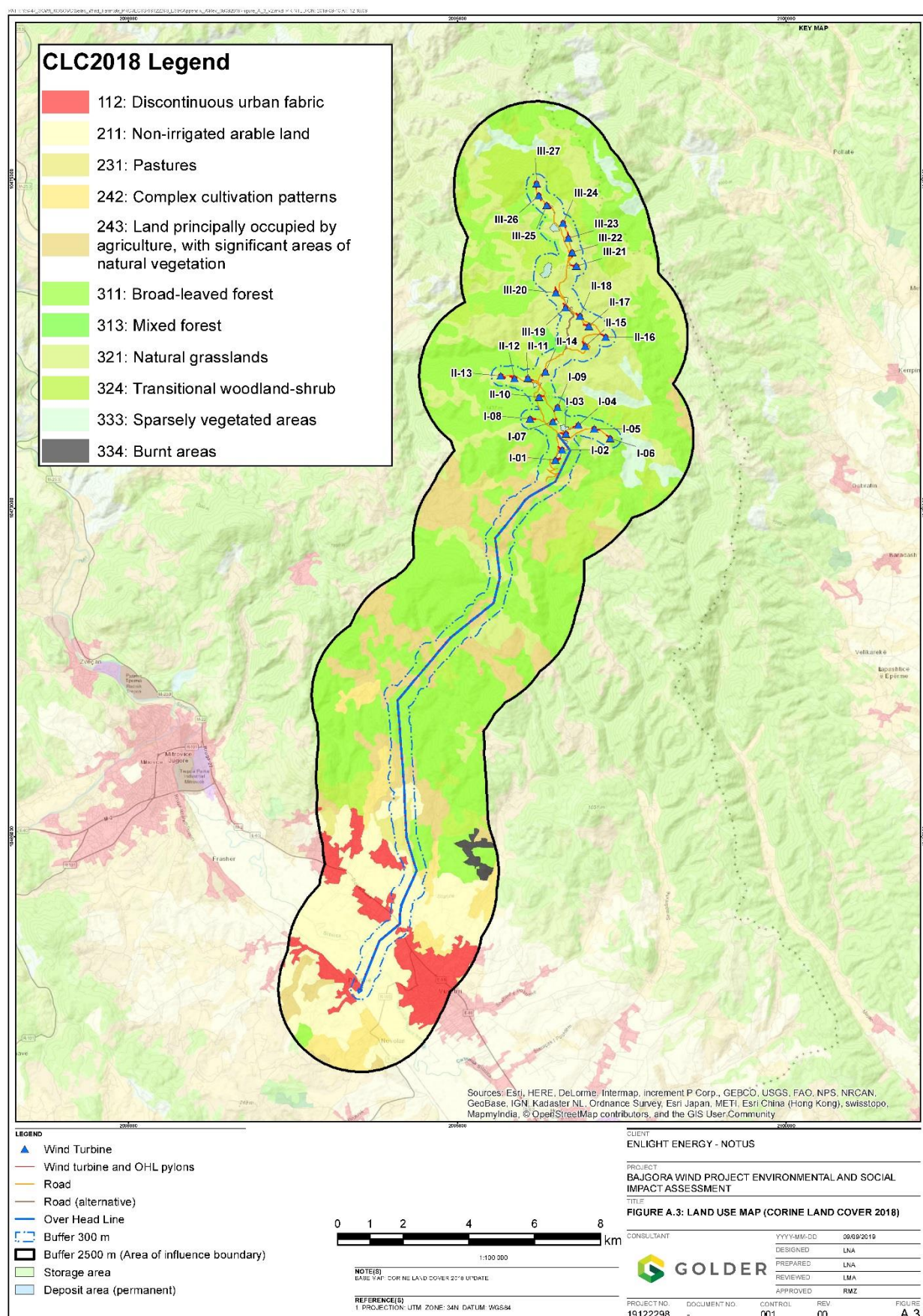
In the OHL area the main feature contributing to the sensitivity of the component is represented by presence of small settlements and few people potentially exposed to noise during construction and decommissioning phases or occasionally during maintenance activities. The sensitivity of the noise component in the OHL area is estimated to be **medium-high**.

APPENDIX A

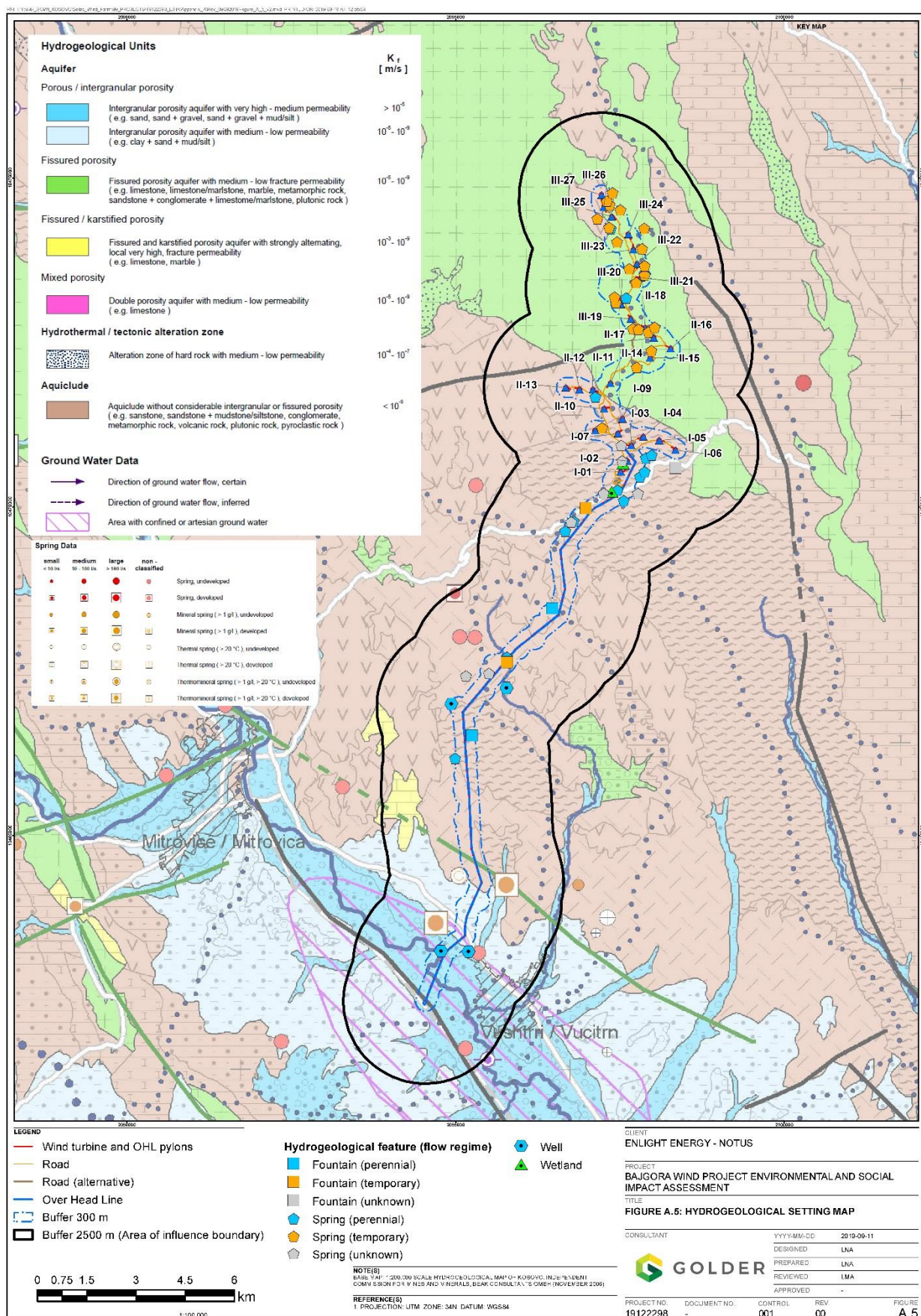
Thematic Maps













REPORT

Bajgora Wind Project
Environmental and Social Impact Assessment
Section 6.B - Biodiversity Baseline

Submitted to:

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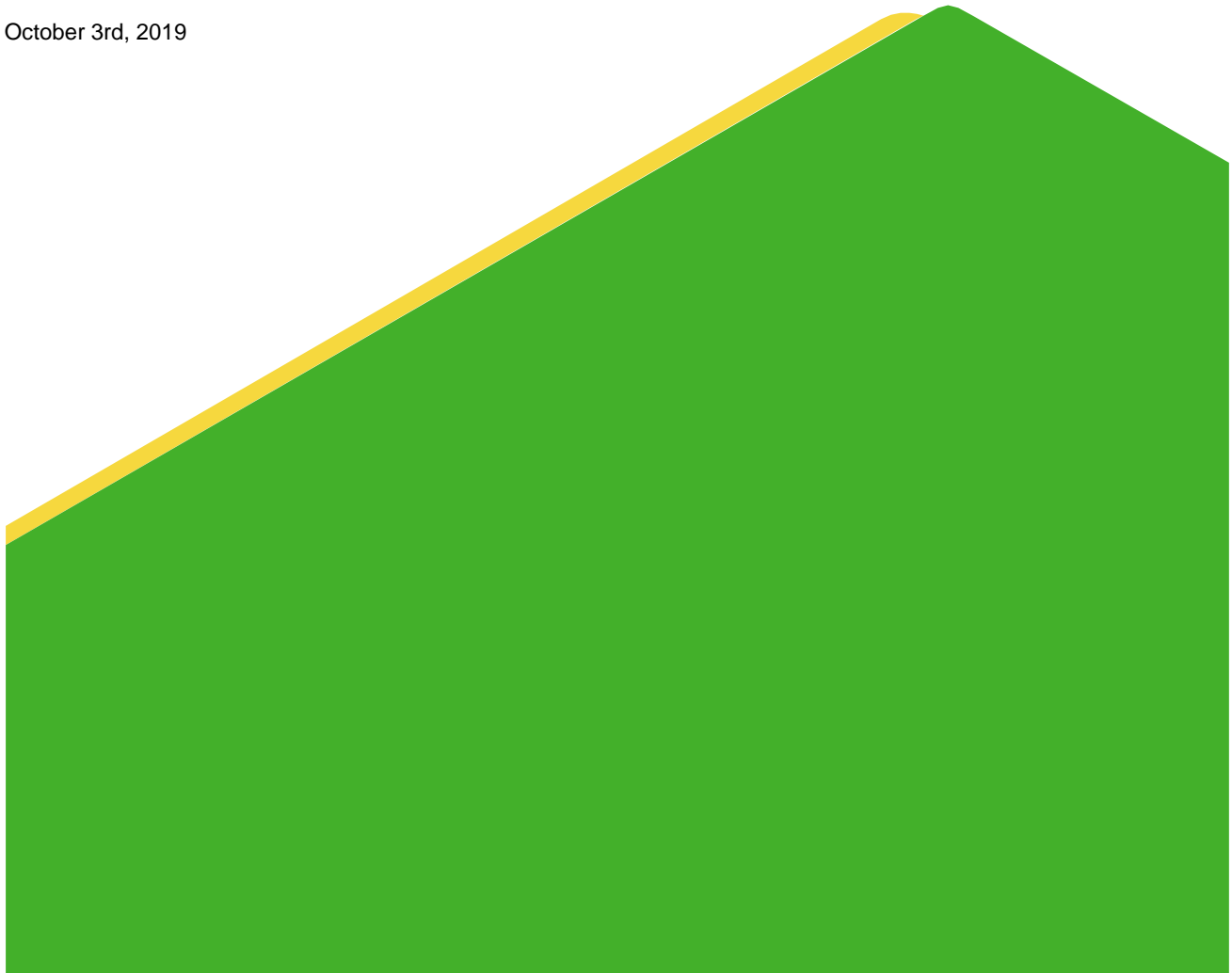


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6.0 B - BIOLOGICAL COMPONENTS BASELINE

6.1 Introduction

This section describes the status of the biological components in the likely Area of Influence (Aol) of the Project, based on data and information consolidated from desktop and field studies conducted between 2016 and the time of reporting.

Desktop and field biodiversity studies prior to May 2019 have been conducted by Biomaster Ltd. and the results have been presented in separate reports to support the EIA of the Wind Farm (WF) and the Overhead Line (OHL), submitted to Kosovo authorities for permitting purposes. Since May 2019 desktop studies, as well as design and coordination of the field studies have been conducted by Golder, while field studies have been conducted by Biomaster. More recent studies have been designed to establish a biodiversity baseline suitable to support the requirements of EBRD PR6 and IFC PS6, as well as good industry practice in the wind farm sector, building on previous studies prepared with different objectives.

Although field studies on birds and bats are ongoing and will be completed in October 2019 to cover the seasonal activity of these two groups, data collected to date are considered sufficient to understand and mitigate the Project risks and impacts on biodiversity.

6.1.1 Identification of the study area

Two study areas have been defined considering the likely Area of Influence (Aol) of the project and the need to provide a wider regional context for the biodiversity values at stake.

6.1.1.1 Regional Study Area (RSA)

The biodiversity Regional Study Area (RSA) is an area containing a geographically distinct assemblage of species, natural communities, and environmental conditions. The RSA is defined to assess, based on literature review, the species and habitats potentially occurring within and in the vicinity of the Project Aol, and to provide a regional context to the assessment of the biodiversity values in terms of distribution, abundance, and trends.

The RSA defined for the Projects corresponds to the “Balkan mixed forest” (PA 0404) (Olson, 2001¹) which is considered part of the broader biome category “*Temperate broadleaf and mixed forests*” (Figure 1). The Balkan mixed forest covers most of Bulgaria and bordering countries, with the exception for the Rodopes mountains. The vegetation of this area can be defined typically “Central European”.

Mixed oak forests are abundant, with *Quercus frainetto* as the dominant tree species. Oak forests share the valleys with pines, silver fir (*Abies alba*) and Norway spruce (*Picea abies*) forests and grasslands. High valleys and sheltered slopes feature forests dominated by beech (*Fagus sylvatica*) and hornbeam (*Carpinus orientalis* and *C. betulus*).

The diversity of flora and fauna is higher than in other European areas, with a high number of endemic plant species. The region herpetofauna shows one of the highest species richness in Europe.

¹ Olson, D. M., Dinerstein, E., Wikramanayake, E. D., Burgess, N. D., Powell, G. V. N., Underwood, E. C., D’Amico, J. A., Itoua, I., Strand, H. E., Morrison, J. C., Loucks, C. J., Allnutt, T. F., Ricketts, T. H., Kura, Y., Lamoreux, J. F., Wettengel, W. W., Hedao, P., Kassem, K. R. 2001. Terrestrial ecoregions of the world: a new map of life on Earth. *Bioscience* 51(11):933-938.



Figure 1: Regional Study Area (RSA). The red square indicates the Project location.

6.1.1.2 Local Study Area (LSA)

The biodiversity Local Study Area (LSA) includes the Project components, associated facilities and temporary facilities, as well as the expected Area of Influence of the Project.

This area is defined considering the physical and biological characteristics of the area and the ecological requirements of the Species of Conservation Concern (SCC).

The area is part of the wider RSA. There are no clear physical boundaries defining the LSA. For this reason, the LSA was designed as a 3km buffer around the WF area and a 300 m buffer around the OHL (Figure 2). These buffers are considered as the limits beyond which no detectable effects on biodiversity are expected.

The LSA is characterized by a significant difference of altitude, almost 1000 meters between the highest point (WT 22, 1712 m a.s.l.) and the lowest one (powerline substation). Consequently, it includes a variety of habitats and ecological conditions. This explains the high diversity of the flora and fauna identified as potentially present.

According to EIA studies conducted for the Project, the LSA can be divided in different biomes, containing different habitats and in turn partially different communities. In particular, the wind farm area was divided, under a habitat assessment, as follows (–see the EIA studies):

- Biome of sub-Mediterranean-Balkan forests (SBF)
- Biome of Balkan European forests (BEF)
- Biome of European Forest of Taiga type (EFTT)
- Biome of South Balkan mountain pastures and quarries (MPQ).

The OHL area, instead, was assessed as containing the following habitats and bio-geographical units units (see the EIA studies):

South Balkan mountain pastures and quarries (MPQ)- habitat of mountain pastures.

- Balkan Middle European forests (BMEF) represented by beech forests and beech coppice
- Biome of sub-Mediterranean-Balkan forests (SBF) represented by biotopes/habitats of oak forests and oak coppice
- Biome of Mediterranean semi-deserts (MSD)- hilly pastures
- Biome of Pannonian-Dakian Steppes (PDS)- agricultural areas

The high altitudinal variation in the OHL LSA explains the higher diversity in habitats and species present, which in part overlap with the WF habitats and species.

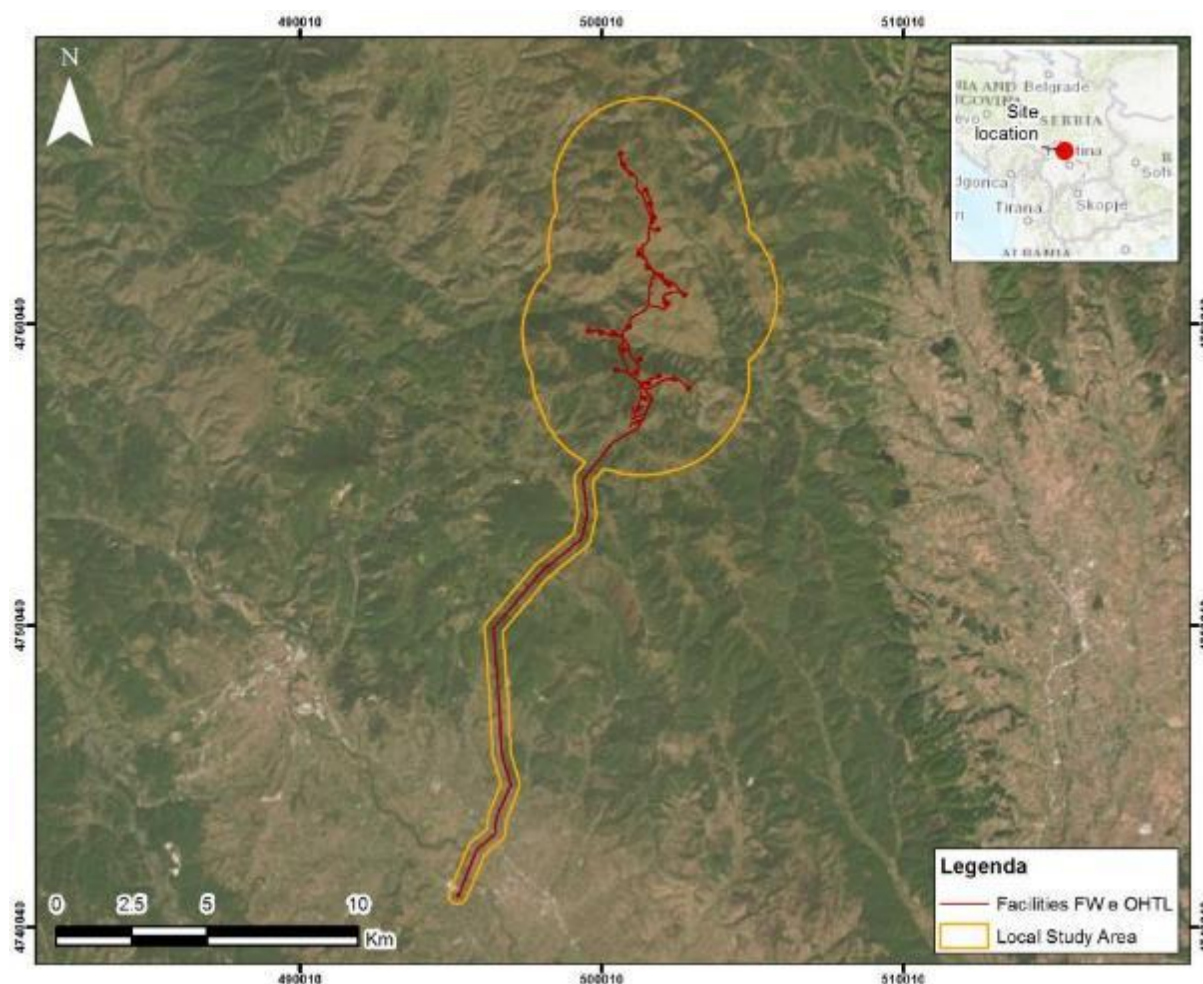


Figure 2: Local Study Area (LSA)

6.2 Methodology

6.2.1 Desktop studies

The literature review focused on the RSA area in order to document available information on local and global distribution, conservation status, ecological requirements, phenology, life cycle etc. of species as well as relevant information on other ecological features.

Scientific literature and “grey” literature were considered in order to give an overview of the biodiversity sensitive elements potentially present in the area.

The information collected during the literature review, together with the expert opinion from a local ecologist, allowed to create lists of species and habitats potentially present within the LSA.

A list of species potentially present according to the IUCN was obtained within a buffer of 50 km from the Site using the *IBAT for business* tool. The list was then screened, based on the presence of suitable habitat for those species in the LSA. Only the species defined as potentially present by this screening were considered in the further studies.

A desktop study was carried out by Golder, in order to determine the ecology and the suitable habitats of Species of Conservation Concern (SCC) to be further investigated with specific field surveys.

The literature review included the following:

■ **Scientific publications and other official publications used for desktop analysis**

For the wind farm desktop study, the following methodological and biogeographical information were used to create the species lists:

- EUNIS Database (2018) European Nature Information System. <http://eunis.eea.europa.eu> Fauna Europaea (2018) Fauna Europaea version 2.6.2. <http://www.faunaeur.org> [accessed 05.01.2018]
- Millaku, F., Rexhepi, F., Krasny, E., Pajazitaj, Q., Mala, Xh. & N. Berisha, 2013. The red book of vascular flora of the Republic of Kosovo, Ministry of environment and spatial planning, Prishtinë, pp. 446.
- Ministry of environment and spatial planning, Kosovo environmental protection agency, Kosovo institute for nature protection, 2015. State of Nature report 2010 – 2014, Pristine, pp. 130.
- Revised Annex I of Resolution 6 (1998) of the Bern Convention on species requiring specific habitat conservation measures, Council of Europe, 2011.
- Van Swaay, Chris, and Martin Warren, 1999. Red data book of European butterflies (Rhopalocera). Vol. 99. Council of Europe.
- Van Swaay, Chris, and Martin Warren, 2003. Prime Butterfly areas in Europe: Priority sites for conservation. National reference centre for Agriculture, Nature and Fisheries, Ministry Agriculture, Nature management and Fisheries, The Netherlands. Pp. 693.
- Administrative Instruction No.18/2012 for Proclamation of Wild Species Protected and Strictly Protected, Flora species, pp.28.
- Administrative Instruction GRK no. 18/2013 on proclamation of the ecological network was approved on 156 meeting of the Government of the Republic of Kosovo with the decision No. 03/156, date 13.11.2013.
- Administrative Instruction No.12/2017 for Proclamation of Wild Species Protected and Strictly Protected: Fauna species pp.
- Department of environment protection, 2016. Strategy and action plan for biodiversity 2011 – 2020, Prishtina, pp. 70.
- Dreshaj, A., Millaku, B., Selimaj, A., Turkaj E. & E. Kukiqi 2017. Heavy Metals in Water, Biological Changes in Aquatic Ecosystems, Economic Damage in R, Kosovo J. Pharm. Sci. & Res. Vol. 9(8):1270-1273

■ **Other methodological literature supported the implementation of the baseline:**

- BirdLife International (2004) Birds in the European Union: a status assessment. Wageningen, The Netherlands: BirdLife International.
- European Commission (EC) DG Environment, 1999. Interpretation manual of European Union habitats, pp. 124.
- Bat Conservation Trust, 2007. Bat Surveys, Good Practice Guidelines, London. Capita Symonds, 2009. River Ellen Bridge - Site Walkover Survey Report, pp. 33.
- English Nature, 2004. Guidelines for Developers. English Nature, Peterborough.

■ **Web sources:**

- The IUCN Red List of Threatened Species. Version 2017-3. <www.iucnredlist.org>
- WWF database (<http://www.worldwildlife.org/ecoregions>)
- The Global Ecoregions: <http://www.worldwildlife.org/biomes>
- Ramsar Convention website (<http://www.ramsar.org/>)
- IUCN World Database on Protected Areas (<https://www.iucn.org/theme/protected-areas/our-work/parks-achieving-quality-and-effectiveness/world-database-protected-areas-wdpa>)
- World Database on Protected Areas (<http://www.protectedplanet.net/>)
- European Environmental Agency (EEA), 2012. European Nature Information System (EUNIS). Retrieved from: <http://eunis.eea.europa.eu>
- IUCN IBAT for business list (species list potentially existing within 50 km from the Wind farm)
- GBIF | Global Biodiversity Information Facility (<http://www.gbif.org>)
- KEW Science – Plants of the world online: (<http://powo.science.kew.org/>)
- BirdLife International (2004) Birds in the European Union: a status assessment (www.birdlife.org)
- Euro+Med (2006-): Euro+Med PlantBase - the information resource for Euro-Mediterranean plant diversity (<http://ww2.bgbm.org/EuroPlusMed/>)

- Local national legislation for the protection of flora and fauna species was also considered, in particular the Nature protection Law No. Admin. instr. N. 18/2012. This law designates species as “protected” (P) and “strictly protected” (S) and for groups prescribes the following regulation:

- regulation about **Protected (P)** species is given in Art. 94 and Art. 95 of the Nature protection Law:

Art. 94:

1. Using protected wild specie shall be authorized in a manner and in a quantity ensuring that their population at national or at local level is not endangered.
2. The Minister and the minister competent for agriculture, forestry and water management, each one within his/her competence, shall lay down the protective measures for protected wild specie which include:
 - 2.1. seasonal prohibition on use and other restrictions on the use of populations;
 - 2.2. temporary or local prohibition on use for the sake of regenerating populations to a satisfactory level;
 - 2.3. regulating trade, holding for commercial purposes and transport of live and dead specimens.

3. The Ministry shall keep records of the method and intensity of use of protected wild specie in order to establish and monitor the state of populations. Where established that owing to use, the protected wild species is under threat, the Minister may issue an order prohibiting or restricting the use of such species.

Art. 95

1. The use of any devices for capturing and killing wild animal specie as well as the use of agents that may induce local vanishing or severe disturbance of populations of such species, and especially:

- 1.1. traps;
- 1.2. crossbows;
- 1.3. electrical devices capable of killing or stunning;
- 1.4. artificial light sources;
- 1.5. mirrors and other dazzling devices;
- 1.6. sound transmitters: tape recorders, cassette recorders, emitting sounds of call, pain or response;
- 1.7. devices for illuminating the targets;
- 1.8. sighting devices for night shooting comprising an electronic image magnifier or image converter;
- 1.9. explosives;
- 1.10. poisons or dazing baits;
- 1.11. semiautomatic or automatic weapons with a magazine capable of holding more than two (2) cartridge;
- 1.12. aircrafts;
- 1.13. moving motor vehicles;
- 1.14. other means set out in international treaties.

- regulations about **Strictly Protected (S)** prot. species is given in Art 96 and 97 of the Nature protection Law:

Art. 96

1. Some wild species may be strictly protected in all territory of Republic of Kosovo or in any part of it.
2. Ministry by management plan and action plan determines the protection measures of wild species that are under strict protection and measures for their habitats' protection.
3. Whether any area it is temporary habitat of the wild species under strict protection whereas its protection may not be safeguarded otherwise, the minister may issue a decision, after taking consent by the Ministry of Agriculture, Forestry and Rural Development, to announce that territory or any part of it as temporary under protection, but not for a period exceeding six (6) months.

Art. 97

1. It shall be forbidden to pick, collect, destroy, cut or uproot wild growing strictly protected plants and mushrooms.
2. It shall be forbidden to hold and trade of the wild growing strictly protected plants and mushrooms.
3. For the animals that are under strict protection which freely lives in the nature, it's forbidden:
 - 3.1. to take them from the nature;
 - 3.2. to catch and/or kill them occasionally;
 - 3.3. to harm and/or destroy consciously the development forms, nests, dan and also their multiplication and congregation areas;

- 3.4. consciously disturbing them, especially during their multiplication period, youngster rising, migration and wintering, if the disturbance is important in proportion with their protection purposes;
- 3.5 consciously to destroy and/or taking eggs from the nature or keeping the empty eggs;
- 3.6. harm and/or destroy their multiplication and congregation areas;
- 3.7. hidden them, keep them, cultivating them, trading them, importing, exporting, and alienating them and in any kind of manner to cosume and preparation.

4. Protection shall also extend to wild growing plants and fungi, as well as wild animals found in a national park, strict reserve, and of the special areas, when it is about plants and mushrooms that sprouts by themselves, and also for wild animals because of which the area is announced as protected, and also underground animals even if are not protected as an individual species, if by protection act of that area for one particular specie its not defined differently.

5. For unconsciously catching them and /or killing animals which are under strict protection, shall be informed the Ministry. The ministry keeps evidences for catching /or unconsciously killing animals under strict protection and decide the protection measures with aim of preventing negative impacts on some species.

Art. 98

1. Exception from provisions of the Article 97 of this Law, in case of un-existing of other suitable possibilities and in case when exception does not harm the existence of certain population, the Ministry may allow the activities with purpose of:

- 1.1. protection of plants, mushrooms and animals, and also protection of the nature habitats;
- 1.2. preventing severe damages on crops, livestock, forests, fishponds, water and other forms of property;
- 1.3. protection of public health and safety, air safety or other overriding public interests;
- 1.4. research and education, re population, reintroduction and necessary reproduction.

2. The Ministry may authorize, on a selective basis and to a limited extent, taking, holding and other reasonable use of certain strictly protected wild specie in small quantities under strict control in order to maintain favourable status of the species.

6.2.2 Flora Field studies

The objective of the flora field surveys was to observe the potential Species of Conservation Concern (SCC) present in the LSAs, in order to gather some important data, such as their habitat type, their abundance, distribution, phenology, main threat/disturbance present, and to support the preparation of the habitat map and the list of potentially present flora species.

The first flora field studies were conducted by Biomaster LTD within the scope of the walk over surveys and pre-construction monitoring. The surveys were performed in the following periods:

- in the Wind Farm area walk over surveys and pre-construction surveys were performed:
 - in 2017 on April 10th, June 15th -16th, August, October 17th;
 - in 2019 on May 4th - 5th, May 11th - 12th and June 9th, June 15th -16th;
- in the OHL area walk over surveys were performed:
 - in 2018 from the end of September to the beginning of October;
 - in 2019 on April and May 2019.

- Systematic field surveys targeting flora SCC identified as present or potentially present based on the previous studies were conducted by GR Albania between July 31st and August 1st, 2019 on a 300 m buffer around the OHL and on August 14th, 2019 in the Selac I area near the first 6 turbines. Because of the access difficulties on site, it was not possible to extend the survey also to the whole Wind Farm area. Data collected are considered sufficient to identify the potential SCCs present, however pre-construction survey have been included as a precautionary measure. During this period, flora surveys were performed in 30 different locations (Figure 3), belonging to 6 different habitat types according to the EUNIS classification, and flora species were directly identified. If this was not possible, the plants were collected or photographed for further identification in laboratory. For each sampling stations the following data were collected in standard templates:
- unique sampling stations code;
- surveyors name;
- survey date;
- GPS coordinates (datum: WGS84);
- reference number of photos taken;
- slope (decimal degrees),
- aspect (N–E–S–W);
- EUNIS habitat type (level 3 or more) and brief description;
- SCC flora species present and their number, extension and phenology;
- nursery plant species present for caterpillars of butterflies SCC;
- main threat/disturbance present (e.g. grazing, soil erosion, dust deposition) and disturbance level (high, medium, low);
- any other information considered useful (e.g. any particular fauna activities, signs of recent flooding, possible future disturbance).

If the target species were observed, the exact location of the populations was mapped using a GPS and their extension (m²), abundance (no. of individuals) and percentage (%) of flowering/fruitletting/seeding individuals were estimated.

Photographic documentation was collected at each sampling point: photos were taken in all cardinal directions (N–E–S–W) to represent the habitat type, eventual disturbances, target species present and any other data considered useful.

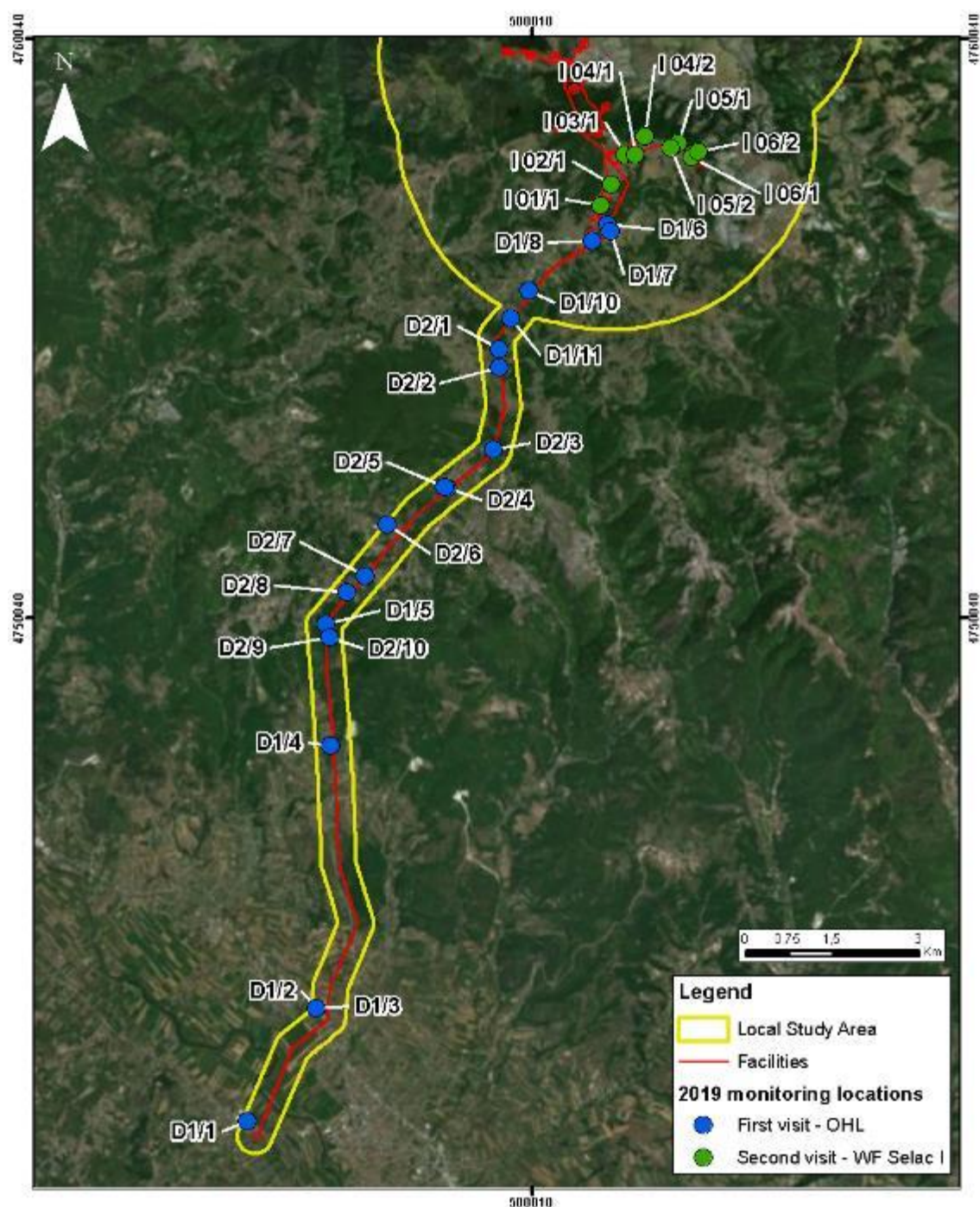


Figure 3: WF Selac I and OHL monitoring locations during 2019 first and second visit

6.2.3 Fauna Field studies

The objectives of the fauna field surveys were to understand the current conditions of the biological components in the LSA, to support the preparation of the habitat map and to prepare the lists of fauna species potentially present. Field studies have been conducted by Biomaster team of experts under the supervision of Prof. Micevski.

In a first phase, most of the biodiversity studies were conducted in the LSA from 2016 (WF) to October 2018 (OHL), in the frame of the respective EIAs. For birds and bats, the surveys were conducted in the following dates and locations.

- Winter sessions of bird sampling in the WF area, performed between December 2016 to March 2017. Various line-transects with point counts for birds were performed. During the same field surveys, the team collected incidental information about other taxa and assessed the suitability of the habitat for various species potentially present based on literature.
- Spring sessions of bird sampling in the WF area between April 2017 and June 2017 (April 10th, June 15th -16th, August, October 17th, 2017). Same data as for the winter session were collected.
- Night sessions for bat monitoring in the Wind farm areas, line transects.

Experts and collaborators involved for birds and bats transects were:

- Branko Micevski;
- Nikola Micevski;
- Angela Angelovska.

Local field assistants and collaborators were:

- Besim Uka;
- Megrims Hyseniz.
- The OHL field studies (end of September 2018, beginning of October 2018) included a walkover survey (WOS) on a 50m buffer around the Power Line, implemented as a habitat suitability assessment supported by a list of species chosen a priori using a biogeographical criterion. Additionally, the OHL project site was visited in April and May 2019, in order to assess the potential for birds and bats migratory corridors along the Sitnica river, which is going to be crossed by the OHL, and along a valley between AP7 and AP8.
- Consultants involved in the WOS were:
 - Branko Micevski, PhD., Biodiversity expert;
 - Nikola Micevski, M. Sc. Biodiversity expert;
 - Aco Teofilovski, M. Sc. Consultant for flora;
 - Angela Angelovska, ecologist, Biodiversity expert;
 - Ivica Milevski, PhD., GIS expert;
 - Naim Berisha, M. Sc., Flora and vegetation expert.

From May to September 2019, Golder coordinated new studies on invertebrates, birds and bats and as well as the pre-construction surveys related to early works along the access road and in the Wind farm area.

The methodology of the studies is described in the paragraph below and includes:

- for butterfly:
- for birds:
 - nightjar survey;

- soaring birds survey;
- for bats:
 - bat surveys at height;
 - additional bat surveys at ground;
 - additional bat survey: mist netting;
 - additional bat survey with SM4 bat detectors.

Experts and collaborators involved for bird and bats studies were:

- Branko Micevski, Dr.Sci. Biologist, biogeographer, Bird and Bat expert;
- Nikola Micevski, Mr.Sci. Ecologist, Bat expert;
- Angela Angelovska, postgraduate student Ecologist, Bat expert.

Local field assistants and collaborators were:

- Besim Uka;
- Mergim Hyseniz.

6.2.3.1 *Butterfly field studies*

The studies focused on the habitats suitable for the butterfly species determining PBFs and was conducted along the construction footprint of the wind farm and OHL and its expected Area of Influence.

The methodology had no quantitative goal and followed a habitat approach. Search were performed only in favourable temperature conditions (temperature > 17°C) and in calm to light winds.

Species were checked by experts by eye or with the use of a binocular and, in the case of a lack of immediate determination of the species, by taking pictures or netting and releasing the individuals in place.

The location of the sampling stations was selected by the local experts in habitats suitable for the target species along the footprint of the wind farm and the powerline. The start and end point of each transect was recorded with a GPS (datum: WGS84) using a unique sampling station code to identify it. GPS tracks were also registered. Additional GPS points were recorded as waypoints for significant observations.

Further data about the occurrence of SCCs were collected by Biomaste LTD within the scope of the walk over surveys and pre-construction monitoring. The surveys were performed in the following periods:

- in the Wind Farm area walk over surveys and pre-construction surveys were performed:
 - in 2017 between April and June;
 - in 2019 on June 19th and 30th;
- in the OHL area walk over surveys were performed:
 - in 2018 from the end of September to the beginning of October;
 - in 2019 on July 4th, between met-mast 90 and 83 with a buffer of 30 m.

Specific field surveys targeting butterflies SCC identified as present or potentially present based on the previous studies were conducted by GR Albania on July 31st and August 1st, 2019 along the OHTL and on September 9th, 2019 in the Selac I area near the first 6 turbines. Because of the access difficulties on site, it was not possible to extend the survey also to the whole Wind Farm area. The surveys were performed in 30 different locations (Figure 4), belonging to 6 different habitat types according to the EUNIS classification, and butterflies species were directly identified. Data collected are considered sufficient to identify the potential SCCs present, however pre-construction survey have been included as a precautionary measure.

At each sampling stations the following data were collected in standard templates:

- unique sampling stations code;
- surveyors name;
- survey date;
- GPS coordinate (datum: WGS84), start and end point.
- reference number of photos taken;
- EUNIS habitat type (level 3 or more) and brief description;
- butterfly species observed and their abundance,
- nursery plant species present for caterpillars of butterflies SCC;
- main threat/disturbance present (e.g. grazing, soil erosion, dust deposition) and disturbance level (high, medium, low);
- any other information considered useful (e.g. any fauna activities, signs of recent flooding, possible future disturbance).
- Photographic documentation was collected at each sampling point. Photos will be taken in all cardinal directions (N–E–S–W) to represent the habitat type, eventual disturbances, target species present and any other data considered useful.
- The photos were collected in folders, separated for each sampling stations and identified with the unique sampling stations code.

During the first site visit all the representative habitats were surveyed under the power line and its buffer area, for the detection of the abovementioned butterfly species.

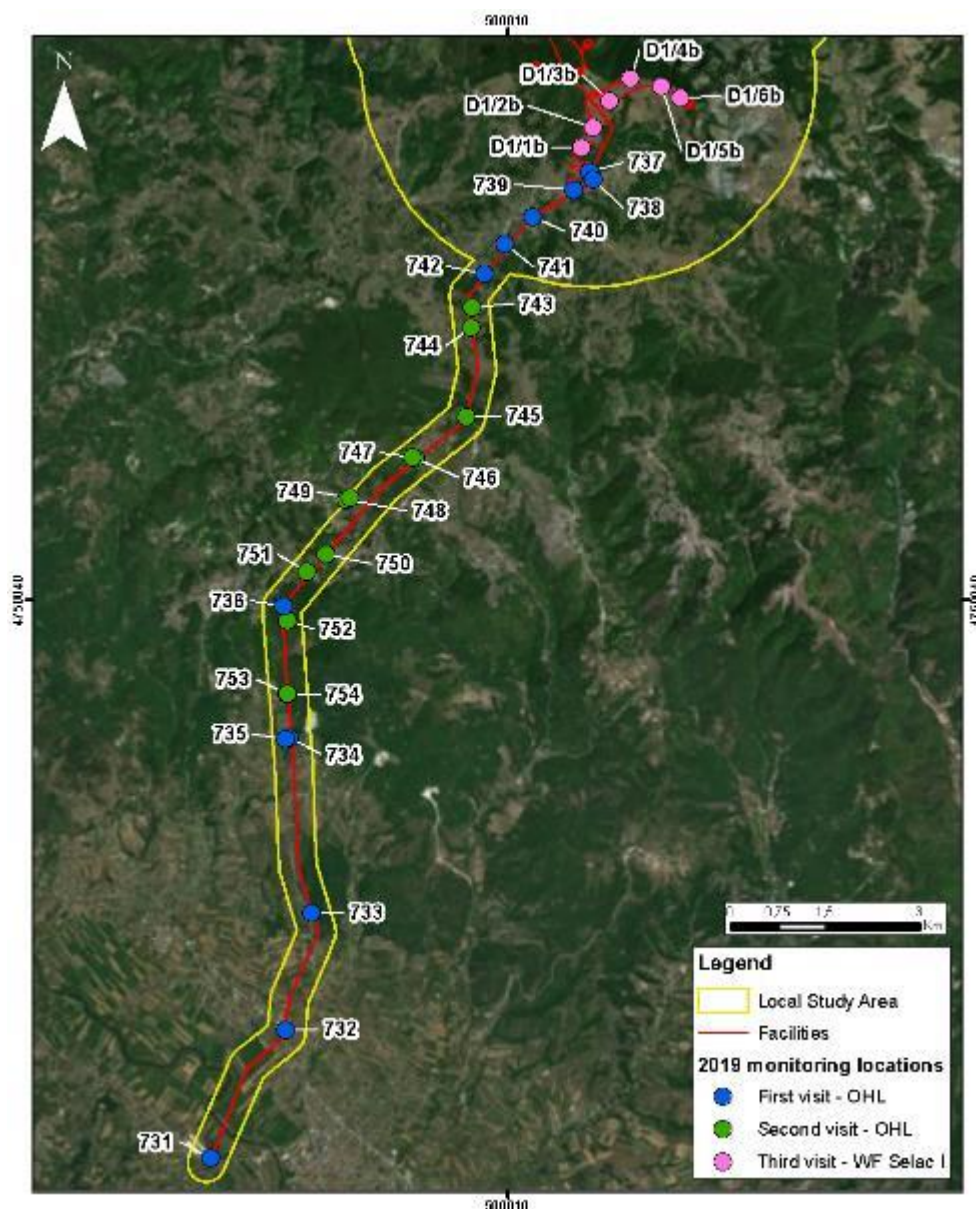


Figure 4: WF Selac I and OHL monitoring locations during GR Albania surveys of 2019

6.2.3.2 Birds field studies

6.2.3.2.1 Previous studies for birds

Field effort organized for the taxon was relevant, as it is one of the target groups potentially impacted by the wind farm during operation. Initially, the area of the wind farm was divided into three sectors according to the three windfarm sectors (Selac I, II, III):

- Sector 1: Barelj, 10 wind turbines (no. 1-10)
- Sector 2: Goldej-Veliki Vrh, 10 wind turbines (no.11-20), and
- Sector 3: Bajrak||, 10 wind turbines (no.21-27)

In each sector, the work was based on line transects (LT) method mostly along the existing roads and the line (row) of the planned wind turbines, in order to enable comparison in monitoring during operation. The area

which was subject to selective inventory included additional 3 km beyond the perimeter of the installation (last/edge wind turbines) for a total project area of approximately 80 km².

Every month, for three days, line transects along the wind farm (5 hours, main road, from WTG 1 to WTG 27) and along Kachandol valley, also with the help of local villagers, were surveyed. From the first third of April until the second third of June 2017, the area within the range of the wind farm was visited every month, in order to establish the time of arrival and the time of stay of bird species in the area during the spring period. The same was done between December 3rd to the end of March 2018.

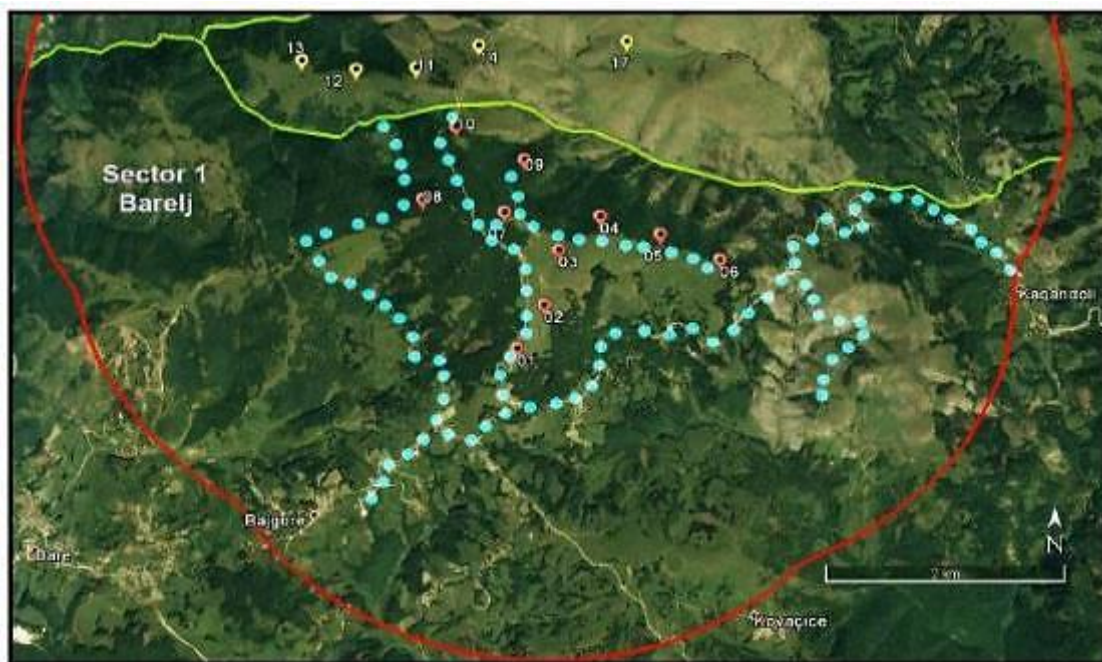


Figure 5: Line transects with point counts for birds and the position of the planned wind farm in the sector I of Barelj in Spring 2017 (from Biomaster Ltd. modified)



Figure 6: Line transects distribution during the bird survey in Spring 2017 in the sector II of Goldej Veliki (from Biomaster LTD, modified)

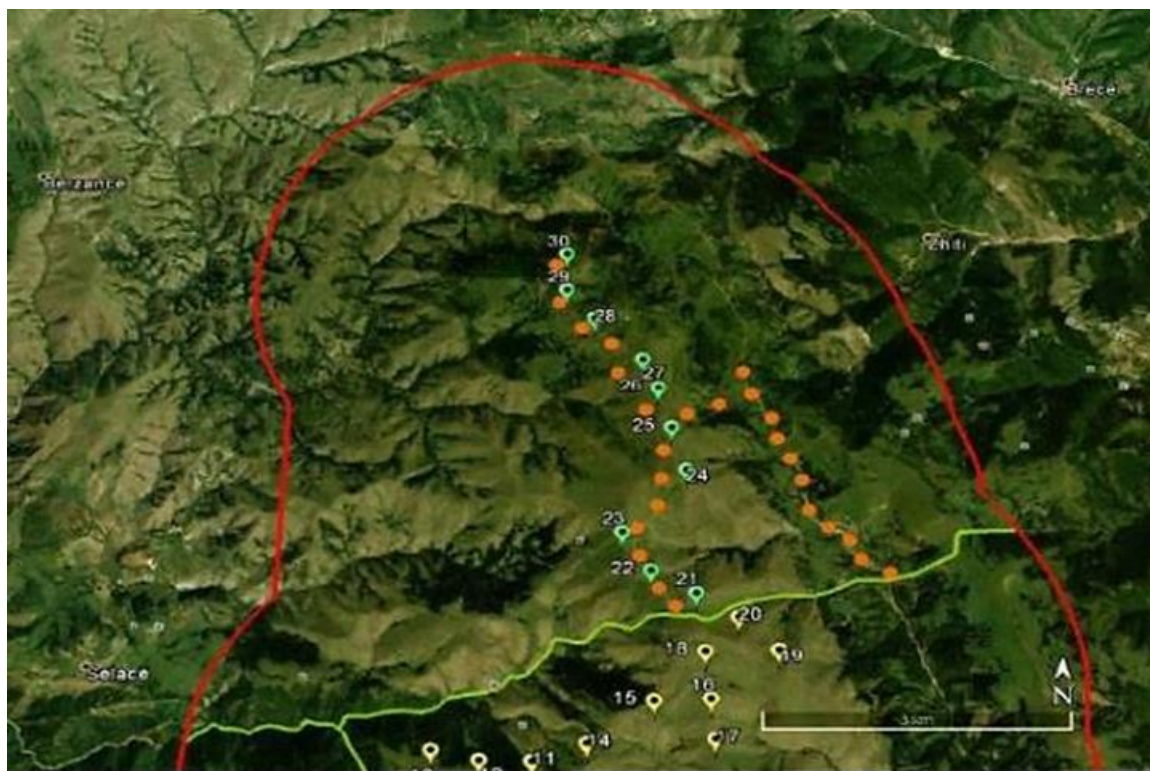


Figure 7: Distribution of line transects conducted during the spring period in the sector III of Bajrak (with orange color) in Spring 2017 (from Biomaster, modified).

Sampling sessions (transects) were thus performed equally during winter and spring, using the following scheme.

All the 25 transects were evaluated in order to check the reliability of the sampling session. With this aim a bootstrap analysis (accumulation curve) was calculated at entire wind farm level for both the seasons. The method plots the number of collected recorded species, under a cumulative approach against the chronological succession of the transects, expecting the reach of a *plateau*, or a decrease of the slope, with the increasing number of performed transects.

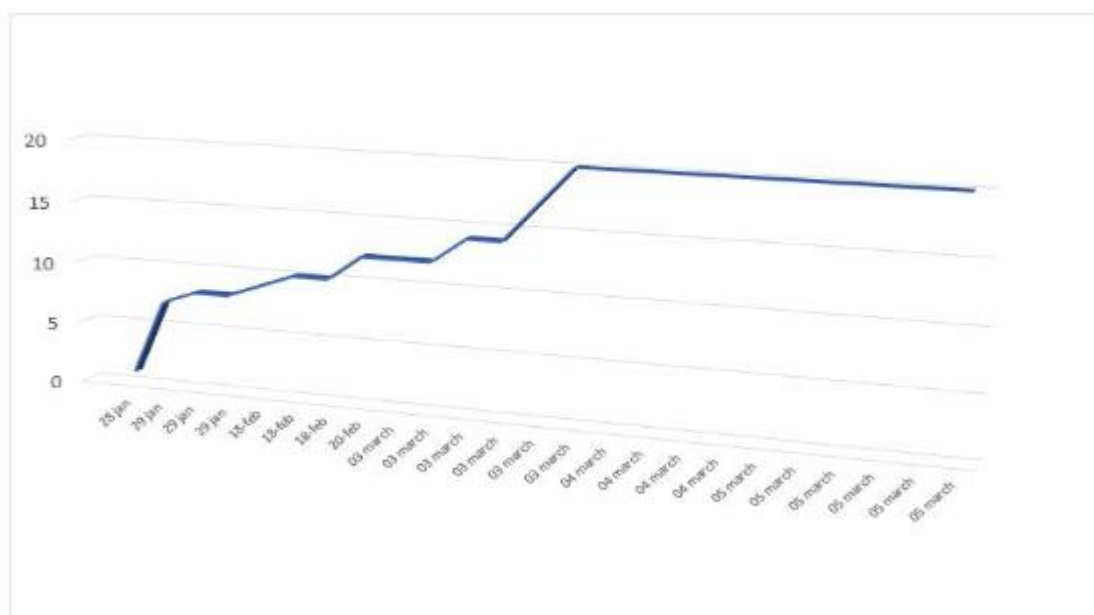


Figure 8: Accumulation curves showing the number of detected bird species as the number of performed transects increases in the wind farm (winter 2017)

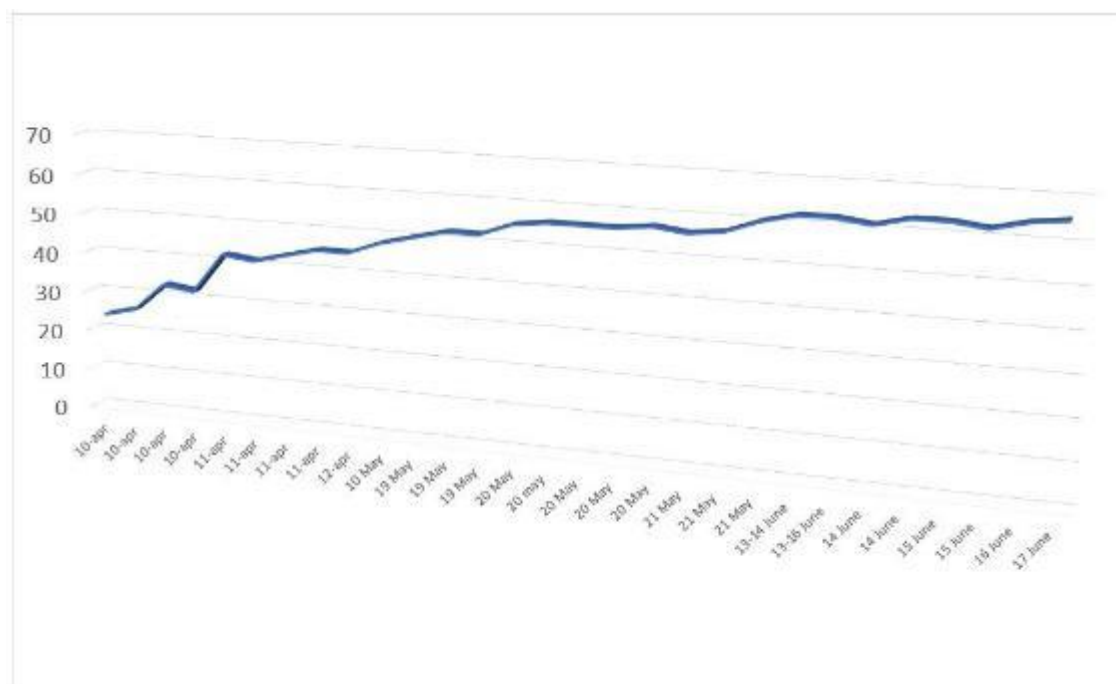


Figure 9: Accumulation curves showing the number of detected bird species as the number of the performed transects increases in the wind farm (spring 2017)

6.2.3.2.2 Additional studies for birds

Further surveys were designed by Golder and executed by Biomaster in 2019, with the objective of gaining an understanding of the presence of - and use of the air space by - selected groups of birds within the LSA. Some additional surveys were planned to complement surveys conducted in 2017 and some using additional methodologies in line with GIP and relevant guidelines (SNH - Recommended bird survey methods to inform impact assessment of onshore wind farms - May 2014; Eurobats Guidelines for consideration of bats in wind

farm projects *Revision 2014*.) The fieldwork is also aimed at understanding the use of the area by migratory species.

Target species of the new surveys were:

- Soaring birds (Raptors, Storks, Herons, Cranes, Pelicans, significant flocks of waterbirds) many of them migrants and particularly exposed to wind farm impact
- The Nightjar (*Caprimulgus europaeus*), very sensitive to wind farms

Nightjar (*Caprimulgus europaeus*) survey in the wind farm area

The Nightjar (*Caprimulgus europaeus*) habitat is represented by the ecotone between wooded and open habitats, with scattered and small trees. According to the EU Guidance on wind energy development in accordance with the EU legislation, the Nightjar is particularly sensitive to collision risk and because of its nocturnal habits the VP surveys are not appropriate.

Even if not a threatened species according to IUCN, the species is considered very sensitive to the effects of wind farms, therefore, the project chose to use a precautionary approach and survey the species. The objective of the work was gaining an understanding of the Nightjar presence, distribution and abundance near the turbines.

Previous surveys had identified the presence of the species in two areas: in sector Goldej-Veliki Vrh near the locality Pisha, at the edge of a scots pine (*Pinus sylvestris*) forest and in sector Bajrak, close to WTG 27. The 2019 survey has initially concentrated the efforts in those areas, but the species was recorded incidentally (during bats monitoring) between WTG 11 and WTG 13 and the study area was extended.



Figure 10: habitat of the Nightjar, *Caprimulgus europaeus* (Photo by Biomaster LTD)

Each of the two areas was visited twice (2019, June 17th and July 16th), between h 20:30 and 24:00, at or near full moon as the Nightjar activity is maximum during this period. Surveys were carried out after dusk on foot and

stopping every few minutes to listen for churring. Weather was cloudy, with a temperature between 12 and 15 °C, light rain and winds at below 5 m/s. Transects duration was 58 minutes.

The survey was repeated in July since June metrological conditions were not considered optimal due to the excessive wind.

All birds contacts were plotted on a 1:10.000 scale map. Simultaneously churring males were mapped. If churring was heard from two locations not simultaneously but up to 30 seconds apart and over 400 m distance they were considered as different males.

The methodology follows Gilbert et al, 1998 Bird Monitoring Methods: A Manual of Techniques for Key UK Species.

Soaring birds survey in the wind farm area

The survey is based on a vantage point (VP) (on high ground) methodology both for migratory and breeding/resident species as described in the Onshore Wind farm Guidance published by Scottish Natural Heritage (SNH 2017). According to the Tafil Region Wind Power Projects - Cumulative Effects Assessment" (IFC, 2017), the VPs were selected in such a way that all together they provide a view of whole Project area and all turbines were covered and buffered to 500 m, with the viewing not exceeding 2 km. Including a 500 m buffer around each turbine reduces the potential that birds that use the flight activity area only occasionally will be missed.

The objective of this survey is to collect suitable data to support the preparation of a Collision Risk Assessment implementing the Collision Risk Model (SNH 2000) for target species, identified as soaring birds, such as raptors, storks, large water birds such as herons, cranes, pelicans and significant flocks of water birds.

Monitoring sessions started in May and were completed in September 2019.

Four Vantage Points (VP) were chosen, as follows:

- VP1 between turbines 3 and 7 covering turbines no. 1 to 8;
- VP2 between turbines 14 and 15 (location mapped as Pisha) covering turbines no. 9 to 16;
- VP3 between turbines 18 and 19 covering turbines no. 17 to 21;
- VP4 between turbines 23 and 24 covering turbines no. 22 to 27.



Figure 11: Vantage points and BAJGORA wind farm

Fifty hours of observations were planned, evenly spread in the period June - October included (at least 10 hours/ VP per month). In line with the adopted monitoring protocol², the following instructions were followed:

- The surveyor spectrum was not larger than 180 degrees in order to guarantee a reliable monitoring.
- All watches didn't last more than 3 hours and were separated by a minimum of 30 minutes break to reduce observer' fatigue.
- Watches were suspended and resumed in case of any changes in visibility, e.g. fluctuations in the cloud base, passing rain shower, or for the observer to rest.
- A combination of more than 9 hours of VP watches was never carried out by the same observer(s) over the course of a single 24-hour period.
- The survey planning considered the time for moving from one VP to the following as well as a 10 minutes period for 'settling in'.
- Each bird observed entering the 2 km range was followed and its path plotted on a 1:25:000 map.
- Every 15 second the height of each bird was assessed and classified as A: between 0 (ground) and 45 m (lowest point of the swing of the turbine); B: between 45m and 178m (maximum height of the turbines); and C: above the turbines.

In four field sessions (June, July, August, September 10 hours/ VP), time spent on the VPs was respectively:

- Total VP1: 41 hours, 30 minutes, 00 seconds.

²Paragraph 3.8.4, Scottish Natural Heritage, *Recommended bird survey methods to inform impact assessment of onshore wind farms*. May 2014.

- Total VP2: 38 hours, 55 minutes, 00 seconds
- Total VP3: 38 hours, 15 minutes, 00 seconds
- Total VP4: 38 hours, 00 minutes, 00 seconds.

Table 1 reports environmental conditions during the implemented surveys.

The percentage of time spent by every recorded species respectively below, above and at the height of the rotor blades were calculated in order to give a first estimation of the probability of collision (a further collision risk report is available separately).

Table 1: Environmental conditions registered during Session of fieldwork for Soaring birds (June, July, August and September 2019)

| VP | Visit No. | Date | T_start | T_end | Duration (H:mm:ss) | Timing cumulative | Cloud (% cover) | Wind Dir. (°) | Wind Speed (m/sec) | Prec. (mm) | Temp. (° C) | Visibility (km) |
|----|-----------|------------|----------|----------|--------------------|-------------------|-----------------|---------------|--------------------|------------|-------------|-----------------|
| 1 | 1 | 08/06/2019 | 10:00 AM | 1:00 PM | 3:00:00 | 3:00:00 | 0 | 90 | 9 | 0 | 20 | >4km |
| 1 | 2 | 10/06/2019 | 6:40 AM | 8:55 AM | 2:15:00 | 5:15:00 | 7 | 225 | 4,4 | 0 | 13,5 | >2.5 km |
| 1 | 3 | 19/06/2019 | 5:50 AM | 8:50 AM | 3:00:00 | 8:15:00 | 0 | | 0 | 0 | 15 | >4 km |
| 1 | 4 | 30/06/2019 | 3:00 PM | 4:05 PM | 1:05:00 | 9:20:00 | 0 | 210 | 1,7 | 0 | 20,5 | >4 km |
| 1 | 5 | 17/07/2019 | 2:20 PM | 4:20 PM | 2:00:00 | 11:20:00 | 4 | 220 | 7,9 | 0 | 16 | >4 km |
| 1 | 6 | 18/07/2019 | 11:10 AM | 1:15 PM | 2:05:00 | 13:25:00 | 6 | 90 | 6 | 0 | 24 | >4 km |
| 1 | 7 | 31/07/2019 | 6:30 AM | 4:15 PM | 9:45:00 | 23:10:00 | 7 | 190 | 4 | 0 | 20 | 4 km |
| 1 | 8 | 31/07/2019 | 4:15 PM | 7:05 PM | 2:50:00 | 26:00:00 | 7 | 190 | 4 | 0 | 20 | 4 km |
| 1 | 9 | 12/08/2019 | 2:30 PM | 5:00 PM | 2:30:00 | 28:30:00 | 0 | 210 | 5,3 | 0 | 26 | >4 km |
| 1 | 10 | 17/08/2019 | 9:50 AM | 12:50 PM | 3:00:00 | 31:30:00 | 5 | 180 | 8 | 0 | 22 | 10 km |
| 1 | 11 | 17/08/2019 | 4:30 PM | 6:30 PM | 2:00:00 | 33:30:00 | 4 | 210 | 1,8 | 0 | 14 | >6 km |
| 1 | 12 | 18/08/2019 | 11:00 AM | 1:00 PM | 2:00:00 | 35:30:00 | 0 | 266 | 4,2 | 0 | 24 | >6 km |
| 1 | 13 | 05/09/2019 | 11:45 AM | 2:45 PM | 3:00:00 | 38:30:00 | 0 | 315 | 4 | 0 | 24 | 5 km |
| 1 | 14 | 06/09/2019 | 6:50 AM | 9:50 AM | 3:00:00 | 41:30:00 | 7 | 180 | 1,2 | 0 | 13 | 6 km |

| VP | Visit No. | Date | T_start | T_end | Duration (H:mm:ss) | Timing cumulative | Cloud (% cover) | Wind Dir. (°) | Wind Speed (m/sec) | Prec. (mm) | Temp. (° C) | Visibility (km) |
|----|-----------|------------|----------|----------|--------------------|-------------------|-----------------|---------------|--------------------|------------|-------------|-----------------|
| 2 | 1 | 08/06/2019 | 1:30 PM | 4:30 PM | 3:00:00 | 44:30:00 | 1 | 90 | 8,9 | 0 | 24 | >4 km |
| 2 | 2 | 19/06/2019 | 1:25 PM | 3:15 PM | 1:50:00 | 46:20:00 | 4 | 337 | 3 | 0 | 24 | >4 km |
| 2 | 3 | 20/06/2019 | 9:30 AM | 12:15 PM | 2:45:00 | 49:05:00 | 7 | 45 | 0,4 | 0 | 17 | >4 km |
| 2 | 4 | 29/06/2019 | 4:20 PM | 6:35 PM | 2:15:00 | 51:20:00 | 0 | 180 | 4,7 | 0 | 20 | >4 km |
| 2 | 5 | 17/07/2019 | 1:50 PM | 4:25 PM | 2:35:00 | 53:55:00 | 3 | 220 | 3 | 0 | 23 | >4 km |
| 2 | 6 | 18/07/2019 | 11:35 AM | 1:35 PM | 2:00:00 | 55:55:00 | 7 | 320 | 1,8 | 0 | 24 | >4 km |
| 2 | 7 | 31/07/2019 | 6:50 AM | 9:15 AM | 2:25:00 | 58:20:00 | 2 | 180 | 4,1 | 0 | 12 | 3 km |
| 2 | 8 | 31/07/2019 | 4:00 PM | 7:05 PM | 3:05:00 | 61:25:00 | 6 | 180 | 4 | 0 | 21 | 6 Km |
| 2 | 9 | 13/08/2019 | 1:30 PM | 4:00 PM | 2:30:00 | 63:55:00 | 0 | 270 | 4 | 0 | 29 | >5 km |
| 2 | 10 | 17/08/2019 | 4:15 PM | 6:45 PM | 2:30:00 | 66:25:00 | 6 | 225 | 6,5 | 0 | 19 | 10 km |
| 2 | 11 | 18/08/2019 | 7:20 AM | 10:20 AM | 3:00:00 | 69:25:00 | 1 | 180 | 1,5 | 0 | 15 | 10 km |
| 2 | 12 | 18/08/2019 | 11:45 AM | 2:45 PM | 3:00:00 | 72:25:00 | 4 | 180 | 2,3 | 0 | 21 | 10 km |
| 2 | 13 | 04/09/2019 | 3:50 PM | 6:50 PM | 3:00:00 | 75:25:00 | 2 | 53 | 0,5 | 0 | 23 | >5 km |
| 2 | 14 | 05/09/2019 | 12:00 PM | 3:00 PM | 3:00:00 | 78:25:00 | 1 | 8 | 1 | 0 | 25 | >5 km |
| 2 | 15 | 06/09/2019 | 7:00 AM | 9:00 AM | 2:00:00 | 80:25:00 | 5 | 200 | 5 | 0 | 11 | >5 km |

| VP | Visit No. | Date | T_start | T_end | Duration (H:mm:ss) | Timing cumulative | Cloud (% cover) | Wind Dir. (°) | Wind Speed (m/sec) | Prec. (mm) | Temp. (° C) | Visibility (km) |
|----|-----------|------------|----------|----------|--------------------|-------------------|-----------------|---------------|--------------------|------------|-------------|-----------------|
| 3 | 1 | 09/06/2019 | 10:00 AM | 1:00 PM | 3:00:00 | 83:25:00 | 5 | 180 | 3,9 | 0 | 19 | >4 km |
| 3 | 2 | 28/06/2019 | 4:05 PM | 6:05 PM | 2:00:00 | 85:25:00 | 2 | 200 | 9 | 0 | 20 | >4 km |
| 3 | 3 | 29/06/2019 | 1:10 PM | 3:40 PM | 2:30:00 | 87:55:00 | 0,5 | 190 | 10 | 0 | 16 | >4 km |
| 3 | 4 | 30/06/2019 | 12:45 PM | 2:45 PM | 2:00:00 | 89:55:00 | 0 | 190 | 3 | 0 | 20 | >4 km |
| 3 | 5 | 17/07/2019 | 10:40 AM | 1:10 PM | 2:30:00 | 92:25:00 | 1 | 209 | 7,4 | 0 | 17 | >4 km |
| 3 | 6 | 18/07/2019 | 6:55 AM | 9:30 AM | 2:35:00 | 95:00:00 | 2 | 225 | 2 | 0 | 13 | 10 km |
| 3 | 7 | 31/07/2019 | 12:30 PM | 3:30 PM | 3:00:00 | 98:00:00 | 6 | 180 | 3 | 0 | 23 | 5 km |
| 3 | 8 | 01/08/2019 | 6:50 AM | 9:30 AM | 2:40:00 | 100:40:00 | 3 | 180 | 2 | 0 | 15 | 10 km |
| 3 | 9 | 13/08/2019 | 10:30 AM | 1:00 PM | 2:30:00 | 103:10:00 | 0 | 310 | 0,4 | 0 | 24 | >5 km |
| 3 | 10 | 17/08/2019 | 1:00 PM | 4:00 PM | 3:00:00 | 106:10:00 | 6 | 180 | 5,6 | 0 | 19 | 10 km |
| 3 | 11 | 18/08/2019 | 7:20 AM | 9:50 AM | 2:30:00 | 108:40:00 | 0 | 0 | 0 | 0 | 10 | >5 km |
| 3 | 12 | 18/08/2019 | 4:15 PM | 6:15 PM | 2:00:00 | 110:40:00 | 1 | 115 | 1,5 | 0 | 19 | >5 km |
| 3 | 13 | 05/09/2019 | 7:05 AM | 10:05 AM | 3:00:00 | 113:40:00 | 0 | 180 | 2,5 | 0 | 15 | >5 km |
| 3 | 14 | 05/09/2019 | 3:45 PM | 6:45 PM | 3:00:00 | 116:40:00 | 7 | 235 | 2,3 | 0 | 19 | >5 km |
| 3 | 15 | 06/09/2019 | 11:30 AM | 1:30 PM | 2:00:00 | 118:40:00 | 7 | 180 | 2,6 | 0 | 20 | >5 km |

| VP | Visit No. | Date | T_start | T_end | Duration (H:mm:ss) | Timing cumulative | Cloud (% cover) | Wind Dir. (°) | Wind Speed (m/sec) | Prec. (mm) | Temp. (° C) | Visibility (km) |
|----|-----------|------------|----------|----------|--------------------|-------------------|-----------------|---------------|--------------------|------------|-------------|-----------------|
| 4 | 1 | 09/06/2019 | 1:15 PM | 4:15 PM | 3:00:00 | 121:40:00 | 3 | 180 | 6,8 | 0 | 21 | >4 km |
| 4 | 2 | 28/06/2019 | 12:45 PM | 3:45 PM | 3:00:00 | 124:40:00 | 5 | 160 | 5,3 | 0 | 18 | >4 km |
| 4 | 3 | 29/06/2019 | 10:40 AM | 12:40 PM | 2:00:00 | 126:40:00 | 0 | 190 | 6,5 | 0 | 18 | >4 km |
| 4 | 4 | 30/06/2019 | 10:30 AM | 12:30 PM | 2:00:00 | 128:40:00 | 0 | 180 | 1 | 0 | 17 | >4 km |
| 4 | 5 | 17/07/2019 | 10:20 AM | 1:20 PM | 3:00:00 | 131:40:00 | 1 | 225 | 1,5 | 0 | 22 | 10 km |
| 4 | 6 | 18/07/2019 | 7:10 AM | 9:30 AM | 2:20:00 | 134:00:00 | 0 | 200 | 0,5 | 0 | 11 | >4 km |
| 4 | 7 | 31/07/2019 | 12:55 PM | 3:15 PM | 2:20:00 | 136:20:00 | 7 | 180 | 5 | 0 | 20 | 3 km |
| 4 | 8 | 01/08/2019 | 7:10 AM | 9:30 AM | 2:20:00 | 138:40:00 | 1 | 110 | 1,6 | 0 | 16 | >6 km |
| 4 | 9 | 13/08/2019 | 6:30 AM | 9:00 AM | 2:30:00 | 141:10:00 | 0 | 213 | 1,3 | 0 | 18 | >4 km |
| 4 | 10 | 17/08/2019 | 1:10 PM | 3:40 PM | 2:30:00 | 143:40:00 | 4 | 270 | 1,6 | 0 | 20 | >5 km |
| 4 | 11 | 18/08/2019 | 12:00 PM | 3:00 PM | 3:00:00 | 146:40:00 | 2 | 120 | 2 | 0 | 18 | >6 km |
| 4 | 12 | 19/08/2019 | 8:00 AM | 10:00 AM | 2:00:00 | 148:40:00 | 0 | 255 | 3 | 0 | 13 | 10 km |
| 4 | 13 | 05/09/2019 | 7:15 AM | 10:15 AM | 3:00:00 | 151:40:00 | 0 | 7 | 6 | 0 | 10 | >5 km |
| 4 | 14 | 05/09/2019 | 3:35 PM | 6:35 PM | 3:00:00 | 154:40:00 | 6 | 180 | 6,8 | 0 | 23 | >5 km |
| 4 | 15 | 06/09/2019 | 11:40 AM | 1:40 PM | 2:00:00 | 156:40:00 | 7 | 205 | 5,3 | 0 | 20 | >5 km |

Objective of the surveys was to gain an understanding of bats presence across the seasons both at ground level and at blades height. Some additional surveys were planned to complement surveys conducted in 2017, while some others were executed using additional methodologies.

The 2019 fieldwork was also aimed at covering all the phenological phases, with a special attention to data representative of the behaviour of migratory species. In fact, those species that fly at a higher height, may suffer of a higher collision risk.

Potential bias due to weather conditions and ongoing early works was properly managed; all surveys were conducted in favourable weather conditions (absence of wind or rain, temperature above 6 °C). and at sufficient distance from early work activities.

For the former, conditions under which the surveys were considered not representative include the occurrence of over 4 consecutive nights with temperatures below 6 degrees, wind above 6 m/s or continuous rain. In order to guarantee the existence of right conditions, meteorological conditions records include temperature, wind speed, and the presence or absence of rain or fog.

Method 1-2: Static acoustic monitoring at ground and at height, on Mast 1 and Mast 2

The objective of the work was gaining an understanding of bats presence across the seasons both at ground level and at blades height at Mast 1 and 2. In particular, the bats' activity was assessed during spring migration period with the May and June sessions, during maternity season in the July survey, during mating season with the August monitoring and during autumn migration in the September.

The four sessions of acoustic monitoring lasted for 7 consecutive nights with Batlogger A+ (Table 2). During each night, the bat detectors was activated for two recording sessions for a total of 6 hours, starting from h 20.00 to midnight (4 hours) and from h 03:00 to 05.00 (2 hours) before sunrise. The device date/time and location were configured to correctly calculate the sunset and sunrise times. No recordings have been made throughout the night to avoid the risk of saturating the SDs and losing data. Records were therefore made during periods of maximum activity of bats including the main peaks of activity for most insectivorous bats of the temperate zone (Erkert, H.G., 1982. Ecological aspects of bat activity rhythms, in Kunz, T.H. (Ed.), Ecology of Bats. Plenum Publishing Corporation, New York, NY, USA).

Due to weather conditions, week 1 of monitoring started on May 21th, 2019, ending on May 28th, 2019 (on May 20th the weather was inappropriate for bats as the temperature fall to 4°C from sunset to midnight and to 3°C from 03:00 to sunrise). Week 2 of monitoring started on June 3rd, 2019, with an end on June 9th, 2019. Week 3 of monitoring started on June 30th, 2019, with an end on July 6th, 2019, Week 4 of monitoring started on August 23th with an end on August 29th, 2019 and Week 5 of monitoring started on September 3th with an end on September 10th, 2019..

Table 2: Acoustic survey sessions for bats (in italic planned sessions)

| Date | Mast 1 ground | Mast 2 ground | Mast 1 height | Mast 2 height |
|------------------|---------------|---------------|---------------|---------------|
| May 21-28 | Batlogger 1 | Batlogger 3 | Batlogger 2 | Batlogger 4 |
| June 3-9 | Batlogger 1 | Batlogger 3 | Batlogger 2 | Batlogger 4 |
| June 30 - July 6 | Batlogger 1 | Batlogger 3 | Batlogger 2 | Batlogger 4 |
| August 23-29 | Batlogger 1 | Batlogger 3 | Batlogger 2 | Batlogger 4 |
| September 3-10 | Batlogger 1 | Batlogger 3 | Batlogger 2 | Batlogger 4 |

The analysis of bat species was carried out by Biomaster Ltd. using the software packages “batsound” and “bat explorer”. The first week raw data were processed by Golder bat expert Roberto Toffoli using the SonoChiro® software and a very high degree of consistency was detected between the results of the two methods.

Method 3: Mist netting, Mast 1 and Mast 2

Objective of the work was to collect observations at ground level in key locations (wind turbines closest to forest). Mist netting locations in the first session are Mast 1 and 2.

Staff involved in the first session of data collection was composed by Nikola Micevski (Biomaster bat specialist), Besim Uka (Assistant), Medzit Ibishi (Technician), Branko Micevski (Biomaster bat specialist), Kemal Ibishi (Technician), Zubmer Ibishi (Technician), Burim Ibishi (Technician).

Two sessions of mist netting monitoring were done, for 3 consecutive nights, on two wind mast (total 6 nights) from sunset to midnight. The first three days of mist netting monitoring started on May 25th, 2019, ending on May 27th, 2019. The second three-days period started in early June, fell on around 3rd to June 5th, 2019. The third three-days period of monitoring started on July 4th, 2019, ending on July 6th, 2019 and the fourth three-days period of monitoring started on August 16th, 2019, ending on August 18th, 2019.

Table 3: Mist netting survey sessions

| Mist netting | Mast 1 | | | Mast 2 | | |
|--------------|----------|----------|-----------|----------|----------|-----------|
| May, 25-27 | Sunday | Monday | Tuesday | Sunday | Monday | Tuesday |
| June 3-5 | Monday | Tuesday | Wednesday | Monday | Tuesday | Wednesday |
| July 4-6 | Thursday | Friday | Saturday | Thursday | Friday | Saturday |
| August 16-18 | Friday | Saturday | Sunday | Friday | Saturday | Sunday |

Between 12 and 14 meters of net, 4 meters high were used in three different locations in the WF for two consecutive nights. Temperature was measured between 8 and 11 degrees, wind speed was measured between 0 and 3, Beaufort scale. Weather conditions were always confirmed with no rain and no fog.

Method 4: Acoustic monitoring with Batlogger A+ bat detectors

Objective of the work was collecting ground observations at key locations, namely the wind turbines which are closest to forest and thus displaying the highest probability of bat collision.

The research method was implemented for two consecutive nights (every month) at each selected turbine (1,6, 13). The bat detector was activated for the whole night, from sunset to sunrise. Sampling dates of the first session were the days 25th and 26th in May. A second session was done on June 7th and 8th, the third session on July 4th and 5th, fourth session on August 23th and 24th, 2019. while the fifth session on September 6th and 7th, 2019..

Method 5: Line transects

Objective of the work of the first session was improving the amount of monitoring at the wind turbines. Transects were performed on three main paths, selected for the reason that they represent three homogenous zones, in terms of habitats and altitude:

- from turbine 1 to turbine 6;
- from turbine 7 to turbine 14;
- from turbine 15 to turbine 27.

Line transects were performed using a car and bat logger, in the areas neighbouring wind turbines. Search speed was constant in the transect and between different transects.

For the first session, personnel involved was Nikola Micevski (Biomaster bat specialist), Medzit Ibishi (Driver and Technician), Burim Ibishi (Driver and Technician). Temperature was +9° C; wind speed was measured 0, Beaufort scale; sky was clean and there was no fog.

The entire path of the line transect was done for the first session of May two nights each month. A total of 10 line transects were performed. First sampling dates were days May 26th and 27th. A second session was done on June 7th and 8th, a third session on July 4th and 5th, a fourth session on August 16th and 17th, 2019 and a fifth session on September 4th and 5th, 2019.

6.2.4 Preparation of the habitat map

The procedure used for the preparation of the habitat mapping was as follows:

- 1) A land cover map was created for the LSA by Biomaster using generic categories (e.g. Beech forest, mountain pasture, river). Mapping scale was 1: 5000. During the fieldwork performed by Biomaster in 2017 (WF) and 2018 (OHL), the land cover was checked on the ground on both the facilities.
- 2) The generic land cover categories were converted into European Nature Information System (EUNIS) habitat types using the highest possible level (level 3 or higher) by analysing satellite imagery, literature review and taking into consideration available previous studies performed in the EIA baseline documents.
- 3) Whenever possible, the potential presence of habitat identified under the EU Habitats Directive (Annex I) was also assessed by appropriate satellite imagery, literature review and taking into consideration available previous studies performed in the EIA baseline documents.
- 4) The results of 2019 flora and fauna field studies were also used to validate the mapping.

6.2.5 Identification of Priority Biodiversity Features

Priority Biodiversity Features (PBFs) present in the Project LSA were identified in accordance with the criteria set out in Performance Requirement 6 (PR6) (EBRD, 2014). The determination of PBFs is based on the following criteria:

i) Threatened habitats;

Habitats considered under pressure by national, regional or international assessments were considered for this criterion. This includes all the habitats identified under Annex I of the EU Habitats Directive.

In addition, EUNIS habitats listed as Vulnerable (VU) in the “European Red List of Habitats” were also considered.

ii) **Vulnerable species;**

All the species listed as having Vulnerable (VU) conservation status according to global IUCN criteria were considered. In the absence of a global IUCN assessment (e.g. Not Evaluated NE, or Data Deficient DD) local assessments were considered (e.g. The Red Book of Vascular Flora of the Republic of Kosovo).

In addition, fauna and flora species of community interest listed in Annex II of the EU Habitats Directive were included.

iii) **Significant biodiversity features identified by a broad set of stakeholders or governments;**

Areas such as Key Biodiversity Areas and Important Bird Areas were considered as any other nationally and internationally important site for conservation of biodiversity. As the LSA is overlapping the Important Bird Area (IBA) Kopaonik, the species triggering IBA criteria were considered as PBFs (EBRD PR6) and CH IFC (PS6)

iv) **Ecological structure and functions needed to maintain the viability of priority biodiversity features described in this paragraph.**

The presence of ecological structures essential for priority biodiversity features was considered, such as riparian zones and rivers, dispersal or migration corridors, hydrological regimes, seasonal refuges or food sources, keystone or habitat-forming species.

6.2.6 Identification of Critical Habitat

Critical Habitats (CH) present in the LSA were identified in accordance with the criteria set out in PR6 (EBRD, 2014) and IFC PS6 (IFC 2012). Determination of CHs is based on the following criteria:

i) **Highly threatened or unique ecosystems;**

Ecosystems that are at risk of significantly decreasing in area or quality, have a small spatial extent, and/or contain concentrations of biome-restricted species were considered for this criterion. This included EUNIS habitats considered Endangered (EN) or Critically endangered (CR) according to the “European Red List of Habitats”.

In order to assess the importance of the LSA for these habitats, the following thresholds were applied (Guidance Note 6, GN80, IFC 2019):

- a) areas representing $\geq 5\%$ of the global extent of an ecosystem type meeting the criteria for IUCN status of CR or EN.
- b) Other areas not yet assessed by IUCN but determined to be of high priority for conservation by regional or national systematic conservation planning.

- ii) **Habitats of significant importance to endangered or critically endangered species.** The presence of species having Endangered (EN) or Critically Endangered (CR) conservation status according to global IUCN criteria was considered. In the absence of a Global IUCN assessment (e.g. Not Evaluated NE, or Data Deficient DD) local assessments were considered (e.g. The Red Book of Vascular Flora of the Republic of Kosovo). In addition, fauna and flora species of community interest identified under the EU Habitats Directive (Annex IV) or under Annex I of the Birds Directive were also included.

In order to assess the importance of the LSA for these species, the following thresholds were applied (Guidance Note 6, GN72, IFC 2019):

- a) areas that support globally important concentrations of an IUCN Red-listed EN or CR species (> 0.5% of the global population AND >5 reproductive units of a CR or EN species);
- c) areas that support globally important concentrations of an IUCN Red-listed VU species, the loss of which would result in the change of the IUCN Red List status to EN or CR and meet the thresholds in GN70(a).
- d) as appropriate, areas containing nationally/regionally-important concentrations of an IUCN Red-listed EN or CR species.”

iii) Habitats of significant importance to endemic or geographically restricted species;

The presence of endemic or restricted range species (EOO less than 50,000 km²) was considered.

In order to assess the importance of the LSA for these species, the following threshold was applied (Guidance Note 6, GN75, IFC 2019):

- a) areas that regularly hold ≥10% of the global population size AND ≥10 reproductive units of a species.

iv) Habitats supporting globally significant migratory or congregatory species;

The presence of Key Biodiversity Areas and Important Bird Areas identified for congregatory species and of Wetlands of International Importance designated under criteria 5 or 6 of the Ramsar Convention was considered. In addition, the presence of migratory and congregatory species were also considered.

In order to assess the importance of the LSA for these species, the following thresholds were applied (Guidance Note 6, GN78, IFC 2019):

- a) areas known to sustain, on a cyclical or otherwise regular basis, ≥ 1 percent of the global population of a migratory or congregatory species at any point of the species' lifecycle.
- e) areas that predictably support ≥10 percent of the global population of a species during periods of environmental stress.

v) Areas associated with key evolutionary processes;

The presence of areas with landscape features that might be associated with evolutionary processes or populations of species that are especially distinct and may be of special conservation concern given their distinct evolutionary history was considered

vi) Ecological functions that are vital to maintaining the viability of biodiversity features described in this paragraph.

The presence of ecological functions without which critical biodiversity features could not persist was considered, such as riparian zones and rivers, dispersal or migration corridors, hydrological regimes, seasonal refuges or food sources, keystone or habitat-forming species.

6.3 Results

6.3.1 Flora species

Based on the literature review and field work, 112 species were considered potentially present in the LSA and other 329 were directly observed in the LSA.

The number of species highlights the presence of a diverse flora typical of natural habitats although modified by human activities (grazing, wood collection, off- road driving). The area does not present any endemic or restricted range species. And none of them is classified as globally threatened (VU-EN-CR) by the IUCN.

Three species are classified as EN (*Daphne blagayana*, *Genista radiata*, *Senecio procerus*) and two as VU (*Gentiana lutea*, *Gentianella bulgarica*) according to the Kosovo Red Book (Millaku et al, 2013). One species, *Echium russicum*, is included in Annex II, IV of the Habitat Directive.

The complete list of flora species potentially present in the LSA is available in Appendix A.

6.3.2 Fauna species

6.3.2.1 Invertebrate species

Based on the literature review and field work, 126 invertebrate species, belonging to Gasteropoda, Coleoptera, Hymenoptera, Lepidoptera, Odonata and Orthoptera orders, are potentially present within the LSA. Only for Lepidoptera taxon specific field campaigns were conducted.

Species directly observed included 31 species were directly observed in the field, of which 28 species belonged to Lepidoptera, 2 to Hymenoptera order and 1 species was a Gasteropoda invertebrate.

According to the national legislation (*Republic of Kosovo, Administrative Instruction No. 18/2012 for Proclamation of Wild Species Protected and Strictly Protected, Flora and Fauna species*) four species of butterfly (*Apatura ilia*, *Apatura iris*, *Pseudophilotes vicrama*, *Scolitantides orion*) and one coleopter (*Lucanus cervus*) are considered Protected (P), while four species of butterfly (*Erebia medusa*, *Euphydryas aurinia*, *Parnassius apollo*, *Parnassius mnemosyne*) and one coleopter (*Rosalia alpina*) are considered Strictly protected (S).

Two species of butterfly are classified as Vulnerable according to IUCN (*Parnassius apollo*, *Coenonympha orientalis*). According to IFC thresholds, there are no restricted range invertebrate species among those identified in the LSA.

Eight species are listed in the Habitat Directive of which six (6) species are listed in Annex II (*Lucanus cervus*, *Rosalia alpina*, *Euphydryas aurinia*, *Lycaena dispar*, *Parnassius mnemosyne*, *Polyommatus eros*) and six (6) species are listed in Annex IV (*Rosalia alpina*, *Lycaena dispar*, *Parnassius apollo*, *Parnassius mnemosyne*, *Phengaris arion*, *Polyommatus eros*). The complete list of species is available in Appendix A.

Data collected during field studies performed by Biomaster LDT in the wind farm area on June 19th and 30th, 2019 and along the OHTL between mast 90 and 83 on July 4th, 2019 are given in Table 5 and Table 6.

Butterfly species detected during the GR Albania surveys performed on July 31st and August 1st, 2019 along the OHTL and on September 9th, 2019 in the Selac I area are listed in Table 7. None of the listed species is a SCC.

Lepidoptera: general considerations:

According to the European Union and the EUNIS database, the area of the Balkans is, in general, important for the conservation of European butterflies.

According to EUNIS, the highest richness of butterflies species at continental level overlaps with mountainous areas: the Balkans, as well as the Cantabrian Mountains, the Pyrenees, the Alps, the Apennines, the Dinaric Alps and the Carpathians host numerous species (between 100 and 140), many of them declared by EUNIS having a “*restricted range*” (not always in the sense of IFC and EBRD thresholds). According to EUNIS, the territory of the Balkans, together with other mountain areas of Europe, can host a relevant number of endemic butterfly species (between 8 and 16), although lower than in the Alps or in the Pyrenees.

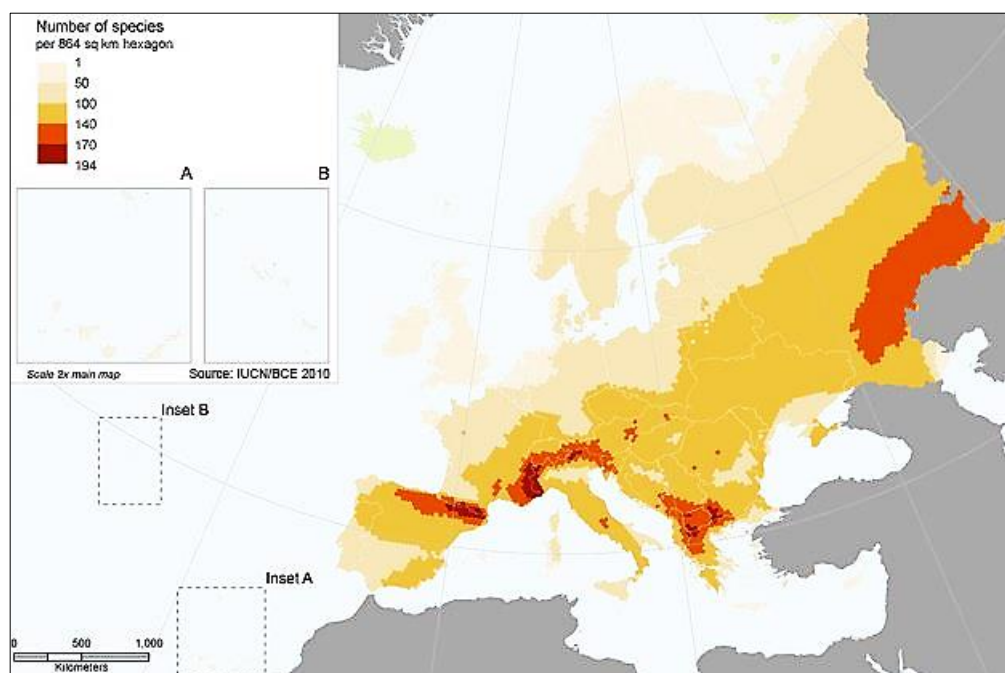


Figure 13: Species richness of Butterflies in Europe (EUNIS)

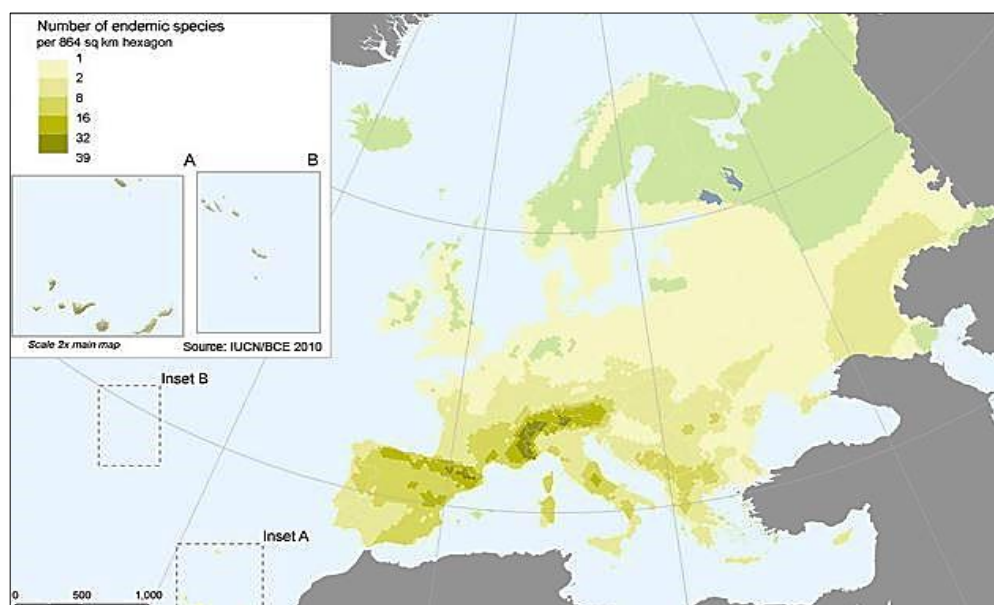


Figure 14: Number of endemic butterflies in Europe (data: EUNIS)

The LSA should be compared with other sampling sites in order to get a benchmark on the present species richness. Jakšić, & Živić, (1995)³ offer a concise synthesis on the research on the taxon in Kosovo and Metohija. They reported the results of 20 years of faunistic research in the region and a check list of 171 species, 43 of which were collected for the first time. The sampled locations were classified into three categories, namely A) *ravines*, B) *central regions of Kosovo and Metohija pastures and hills*, C) *Alpine regions of Kosovo and Metohija*.

The species richness estimated in Bajgora was compared to similar sites included in the mentioned study.

Table 4: Altitudes (from Google Earth) and sampled number of species in the LSA (average altitude between OHL and WF and other Localities sampled by Jakšić, & Živić (1995).

| | Bajgora (LSA) | Streoce | Kopaonik | Koprivnik | Sar planina | Pastrik |
|----------------|---------------|---------|----------|-----------|-------------|---------|
| Altitude | 1150 | 600 | 1900 | 590 | 2045 | 1848 |
| Species number | 82 | 46 | 54 | 33 | 118 | 66 |

Comparing data from The LSA (considered average Bajgora altitude between OHL and WF, 1150 m a.s.l) with data from the authors, it is possible to see how Bajgora has both an average altitude and an average species richness when compared with other sites considered in Jakšić, & Živić, (1995).

The number of estimated species is comparable to the numbers sampled by the authors.

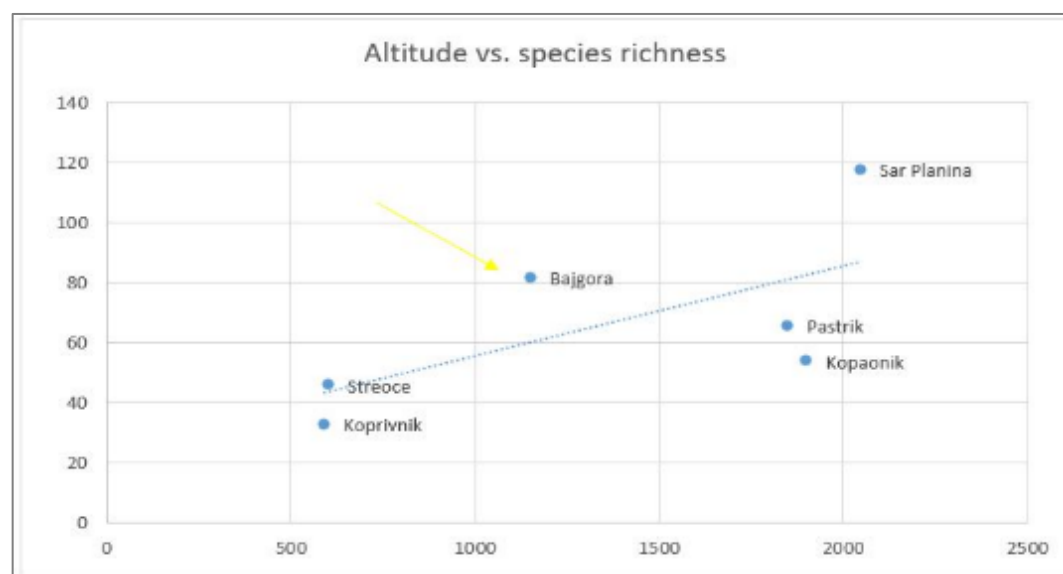


Figure 15: Number of species sampled Bajgora compared with the number of species sampled in five alpine sampling stations from (Jakšić, & Živić, 1995). Altitude are on the X axis, species number on the Y axis.

The LSA can be also compared with the sampling stations in Kopaonik, located in Kopaonik National Park 30 km from Bajgora.

3 Jakšić, P. & Živić, N. (1995): Jakšić, P. & Živić, N. (1995) The butterflies of the Kosovo and Metohija in South Serbia (Lepidoptera: Hesperioidea and Papilionoidea). *Bulletin of the Natural History Museum in Belgrade*, 49–50, 201–218.

Out of 82 species estimated to be in the LSA, 36 species (44%) are shared with the sampling site in the Kopaonik; 46 species are present only in Bajgora (56%). Out of 54 species sampled in in Kopaonik, 18 species (33%) are sampled only in this location and not in Bajgora,

Jakšić, & Živić (1995) have reported the existence of 171 species of butterflies, representing **70 % of all the species distributed on the territory of former Yugoslavia**. While the authors declare this as being a relevant number at national level, the **LSA could host half of these species (47%) , which would correspond to the 33,6 % of the species that can be found in former Yugoslavia**. This is considered a relevant level of butterfly biodiversity.

The authors explain that, while only the 5% are limited to the alluvial lands in Kosovo, not exceeding 700 m. a.s.l., and 10,2 % of species are limited to the higher alpine area (2300-2700 m a.s.l), most of the species is found in Kosovo between 700 and 1800 m, which is exactly the altitude covered in the LSA by the OHL and the WF together

Table 5: Butterfly species found in the WF during Biomaster pre-construction surveys

| Footprint | Date | Species | Status | SCC | Individuals no. and description | Latitude | Longitude |
|-----------|----------|-------------------------------|--|-----|--|-----------|-----------|
| WF | 19.06.19 | <i>Coenonympha orientalis</i> | IUCN -VU; | Yes | 1 | 42.988943 | 21.006882 |
| WF | 19.06.19 | <i>Coenonympha orientalis</i> | IUCN -VU; | Yes | left right by 1 | 42.988819 | 21.006874 |
| WF | 19.06.19 | <i>Coenonympha orientalis</i> | IUCN -VU; | Yes | 1 | 42.988892 | 21.00668 |
| WF | 19.06.19 | <i>Coenonympha orientalis</i> | IUCN -VU; | Yes | 1 | 42.988824 | 21.006608 |
| WF | 19.06.19 | <i>Coenonympha orientalis</i> | IUCN -VU; | Yes | 1 | 42.988188 | 21.00656 |
| WF | 19.06.19 | <i>Coenonympha orientalis</i> | IUCN -VU; | Yes | new, edge of beech forest near the storage | 42.988047 | 21.007398 |
| WF | 19.06.19 | <i>Erebia medusa</i> | SPEC-3* | | 1, adult | 42.988578 | 21.007854 |
| WF | 19.06.19 | <i>Erebia medusa</i> | SPEC-3* | | 1, on Verathrum | 42.988427 | 21.007022 |
| WF | 19.06.19 | <i>Euphydryas aurinia</i> | HD-2; Bern 1,2; Prime species; SPEC 3*, Corine | Yes | 2, copulation | 42.988732 | 21.007381 |
| WF | 19.06.19 | <i>Euphydryas aurinia</i> | HD-2; Bern 1,2; Prime species; SPEC 3, Corine | Yes | 2, copulation | 42.988892 | 21.007085 |
| WF | 19.06.19 | <i>Euphydryas aurinia</i> | HD-2; Bern 1,2; Prime species; SPEC 3*, Corine | Yes | 1 | 42.988266 | 21.00655 |
| WF | 19.06.19 | <i>Euphydryas aurinia</i> | HD-2; Bern 1,2; Prime species; SPEC 3*, Corine | Yes | 1 | 42.988071 | 21.006576 |

| Footprint | Date | Species | Status | SCC | Individuals no. and description | Latitude | Longitude |
|-----------|----------|---------------------------------|--|-----|--|-----------|-----------|
| WF | 19.06.19 | <i>Euphydryas aurinia</i> | HD-2; Bern 1,2; Prime species; SPEC 3*, Corine | Yes | 1 | 42.988287 | 21.007595 |
| WF | 19.06.19 | <i>Euphydryas aurinia</i> | HD-2; Bern 1,2; Prime species; SPEC 3, Corine | Yes | 1 new, edge of beech forest near the storage | 42.988047 | 21.007398 |
| WF | 19.06.19 | <i>Euphydryas aurinia</i> | HD-2; Bern 1,2; Prime species; SPEC 3*, Corine | Yes | new, emerging | 42.988966 | 21.00716 |
| WF | 19.06.19 | <i>Euphydryas aurinia</i> | HD-2; Bern 1,2; Prime species; SPEC 3*, Corine | Yes | 1 | 42.988642 | 21.008327 |
| WF | 19.06.19 | <i>Polyommatus eros/eroides</i> | HD 2,4; IUCN-NT; Bern 1; SPEC 3*; Corine | Yes | 1 | 42.988583 | 21.008389 |
| WF | 30.06.19 | <i>Coenonympha orientalis</i> | IUCN -VU; | Yes | - | 42,990519 | 21,004122 |
| WF | 30.06.19 | <i>Coenonympha orientalis</i> | IUCN -VU; | Yes | - | 42,989904 | 21,006084 |
| WF | 30.06.19 | <i>Coenonympha orientalis</i> | IUCN -VU; | Yes | - | 42,989552 | 21,006177 |
| WF | 30.06.19 | <i>Coenonympha orientalis</i> | IUCN -VU; | Yes | - | 42,989047 | 21,006574 |
| WF | 30.06.19 | <i>Coenonympha orientalis</i> | IUCN -VU; | Yes | - | 42,988916 | 21,006278 |
| WF | 30.06.19 | <i>Coenonympha orientalis</i> | IUCN -VU; | Yes | - | 42,988267 | 21,006151 |
| WF | 30.06.19 | <i>Coenonympha orientalis</i> | IUCN -VU; | Yes | - | 42,990108 | 21,007105 |

| Footprint | Date | Species | Status | SCC | Individuals no. and description | Latitude | Longitude |
|-----------|----------|-----------------------------------|--|-----|---------------------------------|-----------|-----------|
| WF | 30.06.19 | <i>Colias caucasica balcanica</i> | IUCN -LC; | Yes | - | 42,989978 | 21,005782 |
| WF | 30.06.19 | <i>Euphydryas aurinia</i> | HD-2; Bern 1,2; Prime species; SPEC 3*, Corine | Yes | - | 42,988773 | 21,00628 |

* Van Swaay, Chris, and Martin Warren, 1999. Red data book of European butterflies (Rhopalocera). Vol. 99. Council of Europe.

Table 6: Butterfly species found along the OHTL during Biomaster pre-construction surveys and WOS monitoring

| Footprint | Date | Species | Status | SCC | Individuals no. and description | Latitude | Longitude |
|-----------|----------|------------------------|-----------|-----|---------------------------------|-----------|-----------|
| OHTL | 04.07.19 | <i>Argynnis niobe</i> | IUCN -LC; | | - | 42,968131 | 21,018025 |
| OHTL | 04.07.19 | <i>Argynnis niobe</i> | IUCN -LC; | | - | 42,968102 | 21,017993 |
| OHTL | 04.07.19 | <i>Aricia anteros</i> | IUCN -LC; | | - | 42,970773 | 21,01866 |
| OHTL | 04.07.19 | <i>Brenthis daphne</i> | IUCN -LC; | | - | 42,968172 | 21,018268 |
| OHTL | 04.07.19 | <i>Brenthis daphne</i> | IUCN -LC; | | - | 42,963091 | 21,01602 |
| OHTL | 04.07.19 | <i>Brenthis daphne</i> | IUCN -LC; | | - | 42,965915 | 21,01771 |
| OHTL | 04.07.19 | <i>Brenthis daphne</i> | IUCN -LC; | | - | | |
| OHTL | 04.07.19 | <i>Brenthis daphne</i> | IUCN -LC; | | - | 42,96318 | 21,01615 |

| Footprint | Date | Species | Status | SCC | Individuals no. and description | Latitude | Longitude |
|-----------|----------|-----------------------------------|-----------|-----|---------------------------------|-----------|-----------|
| OHTL | 04.07.19 | <i>Coenonympha arcania</i> | | Yes | - | 42,968172 | 21,018268 |
| OHTL | 04.07.19 | <i>Coenonympha arcania</i> | IUCN -LC; | Yes | - | | |
| OHTL | 04.07.19 | <i>Coenonympha arcania</i> | IUCN -LC; | Yes | - | 42,968449 | 21,01823 |
| OHTL | 04.07.19 | <i>Coenonympha arcania</i> | IUCN -LC; | Yes | - | | |
| OHTL | 04.07.19 | <i>Coenonympha arcania</i> | IUCN -LC; | Yes | - | 42,971082 | 21,018872 |
| OHTL | 04.07.19 | <i>Erebia euryale/ligea</i> | IUCN -LC; | | - | 42,965876 | 21,017803 |
| OHTL | 04.07.19 | <i>Erebia ligea/euryale</i> | IUCN -LC; | | - | 42,965875 | 21,017617 |
| OHTL | 04.07.19 | <i>Gonepteryx rhamni</i> | IUCN -LC; | | - | 42,963313 | 21,016157 |
| OHTL | 04.07.19 | <i>Issoria lathonia</i> | IUCN -LC; | | - | 42,965742 | 21,017676 |
| OHTL | 04.07.19 | <i>Issoria lathonia</i> | IUCN -LC; | | - | 42,968172 | 21,018268 |
| OHTL | 04.07.19 | <i>Lasiommata maera</i> | IUCN -LC; | | - | 42,966103 | 21,017664 |
| OHTL | 04.07.19 | <i>Lasiommata maera</i> | IUCN -LC; | | - | 42,968917 | 21,019782 |
| OHTL | 04.07.19 | <i>Leptidea duponcheli</i> | IUCN -LC; | | - | 42,970379 | 21,02078 |
| OHTL | 04.07.19 | <i>Leptidea duponcheli</i> | IUCN -LC; | | - | 42,967045 | 21,018063 |
| OHTL | 04.07.19 | <i>Leptidea sinapis/juvernica</i> | IUCN -LC; | | - | 42,967958 | 21,017818 |

| Footprint | Date | Species | Status | SCC | Individuals no. and description | Latitude | Longitude |
|-----------|----------|----------------------------|---|-----|---------------------------------|-----------|-----------|
| OHTL | 04.07.19 | <i>Maniola jurtina</i> | IUCN -LC; | | - | 42,968172 | 21,018268 |
| OHTL | 04.07.19 | <i>Maniola jurtina</i> | IUCN -LC; | | - | 42,966047 | 21,01762 |
| OHTL | 04.07.19 | <i>Melanargia galathea</i> | | | - | 42,964949 | 21,012901 |
| OHTL | 04.07.19 | <i>Melitaea athalia</i> | | | - | 42,970538 | 21,020696 |
| OHTL | 04.07.19 | <i>Melitaea athalia</i> | | | - | 42,97064 | 21,020665 |
| OHTL | 04.07.19 | <i>Ochlodes sylvanus</i> | IUCN -LC; | | - | 42,967086 | 21,018075 |
| OHTL | 04.07.19 | <i>Ochlodes sylvanus</i> | IUCN -LC; | | - | 42,97068 | 21,020459 |
| OHTL | 04.07.19 | <i>Polyommatus eros</i> | HD 2,4; IUCN-NT; Bern 1; SPEC -3; Corine | Yes | - | 42,968081 | 21,018015 |
| OHTL | 04.07.19 | <i>Polyommatus icarus</i> | IUCN -LC; | | - | 42,971528 | 21,019606 |
| OHTL | 04.07.19 | <i>Polyommatus icarus</i> | IUCN -LC; | | - | 42,965708 | 21,017585 |
| OHTL | 04.07.19 | <i>Polyommatus icarus</i> | IUCN -LC; | | - | 42,971632 | 21,019608 |
| OHTL | 04.07.19 | <i>Polyommatus icarus</i> | IUCN -LC; | | - | 42,97064 | 21,020665 |
| OHTL | 04.07.19 | <i>Pyrgus alveus</i> | IUCN -LC; | | - | 42,968102 | 21,017993 |

Table 7: Butterflies species detected along the OHTL and in Selac I during GR Albania surveys

| Footprint | Date | Waypoint No. | Species | Status | Coordinates | Elev. | Code EUNIS | Habitat name | Shrubs % (50 m) | Trees % (50 m) | Grass % (50 m.) |
|-----------|----------|--------------|----------------------------|-----------|-----------------------------|-------|------------|----------------------|-----------------|----------------|-----------------|
| OHTL | 01.08.19 | WP 744 | <i>Argynnis paphia</i> | IUCN -LC; | X42. 56. 522 Y020,59,587 | 1208 | E1.A | Beech, grazing | 10% | 80% | 10% |
| OHTL | 01.08.19 | WP 753 | <i>Argynnis paphia</i> | IUCN -LC; | X42. 53. 378 Y020,57,438 | 724 | | Beech, pine | 10% | 90% | |
| OHTL | 01.08.19 | WP 751 | <i>Plebejus argus</i> | IUCN -LC; | X42. 55. 399 Y020,58,935 | 1136 | E1A | Beech, fern, grazing | 5% | 80% | 5% |
| OHTL | 01.08.19 | WP746 | <i>Plebejus argus</i> | IUCN -LC; | X42. 54. 426 Y020,57,666 | 939 | | Beech, grazing | | 90% | 10% |
| OHTL | 01.08.19 | WP 749 | <i>Polyommatus icarius</i> | IUCN -LC; | X42. 55. 065 Y020,58,167 | 887 | | Beech, grass | | 90% | 10% |
| OHTL | 01.08.19 | WP 746 | <i>Polyommatus icarus</i> | IUCN -LC; | X42. 55. 399 Y020,58,935 | 1136 | E1A | Beech, fern, grazing | 5% | 80% | 5% |
| OHTL | 01.08.19 | WP 743 | <i>Satyrrium w-album</i> | IUCN -LC; | X42. 56. 694 Y020,59,594 | 1284 | E5.3 | Beech, fern, grass | 20% | 70% | 10% |
| OHTL | 01.08.19 | WP 745 | <i>Satyrrium w-album</i> | IUCN -LC; | X42. 55. 758 Y020,59,522 | 1163 | G1.691 | Beech, fern, grazing | 10% | 80% | 10% |
| OHTL | 01.08.19 | WP 751 | <i>Satyrrium w-album</i> | IUCN -LC; | X42. 54. 426 Y020,57,666 | 939 | | Beech, grazing | | 90% | 10% |
| OHTL | 01.08.19 | WP 753 | <i>Satyrrium w-album</i> | IUCN -LC; | X42. 53. 378 | 724 | | Beech, pine | 10% | 90% | |

| Footprint | Date | Waypoint No. | Species | Status | Coordinates | Elev. | Code EUNIS | Habitat name | Shrubs % (50 m) | Trees % (50 m) | Grass % (50 m.) |
|--------------|----------|--------------|------------------------------|-----------|------------------------------------|-------|------------|---|-----------------|----------------|-----------------|
| | | | | | Y020,57,438 | | | | | | |
| WF (Selac I) | 09.09.19 | D1/6b | <i>Coenonympha pamphilus</i> | IUCN -LC; | N 42° 58 29.440 E 21° 02 01.782 | 1470 | E1.7 | Closed non-mediterranean dry acid and neutral grassland | | | 98% |
| WF (Selac I) | 09.09.19 | D1/6b | <i>Colias croceus</i> | IUCN -LC; | N 42° 58 29.440 E 21° 02 01.782 | 1470 | E1.7 | Closed non-mediterranean dry acid and neutral grassland | | | 98% |

6.3.2.2 Fish species

Under a bio-geographical point of view, Kosovo is a relevant area, in Europe, for the richness of freshwater fishes. EUNS reports that “Eastern and central Europe are also particularly rich, as is all of the Balkan Peninsula”. Nonetheless Serbia and Kosovo do not host a high level of endemic or threatened fishes.

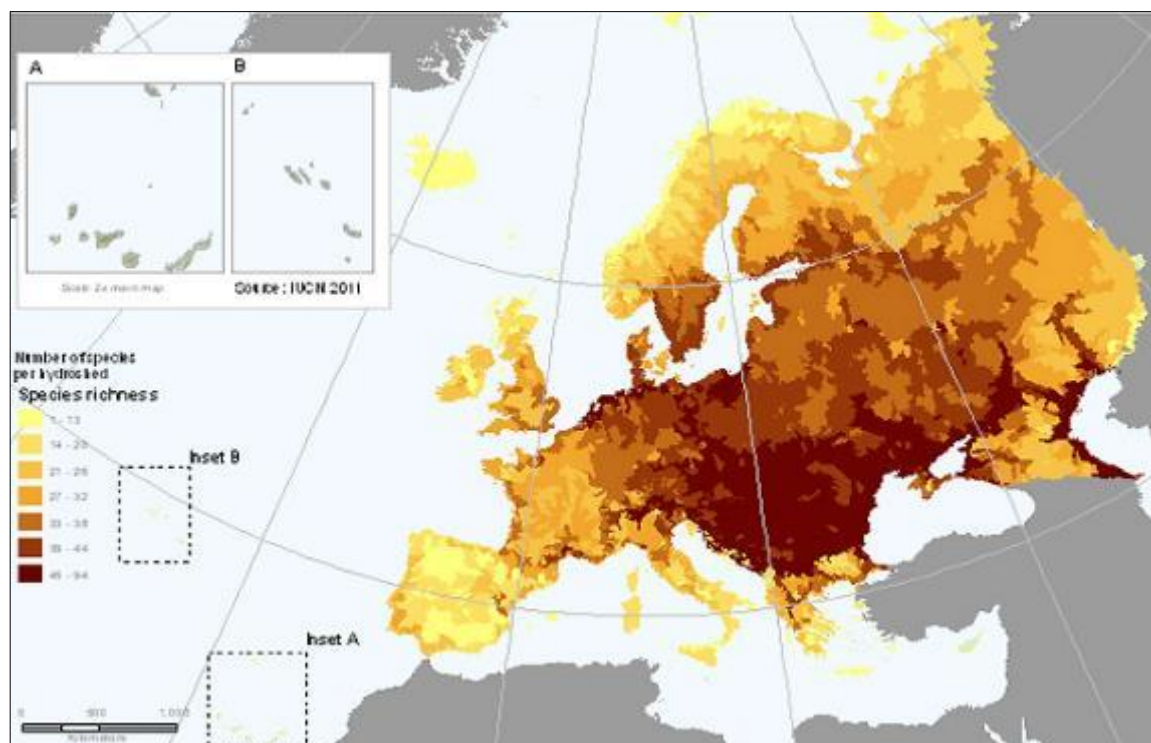


Figure 16: Species richness of freshwater fishes at European level (EUNIS)

Seventeen species were considered as potentially present in the LSA. According to IUCN all were classified as Least Concern (LC) but one, classified as Vulnerable (VU) (*Cyprinus carpio*).

Three species are considered Protected (P) and four Strictly protected (S) according to national legislation. One species is listed in the Annex II of the EU Habitat Directive. There are no endemic/restricted range species.

The complete list of species is available in Appendix A.

6.3.2.3 Amphibian species

Under a bio-geographical point of view, the Balkan peninsula has a relatively low diversity of Amphibians, compared to other areas at a higher latitude (France, Germany, Czech Republic). According to EUNIS, the area is neither relevant for the number of threatened species.

Nonetheless, the project has considered two species as PBF, namely the yellow-bellied toad (*Bombina variegata*) and the crested newt (*Triturus cristatus*).

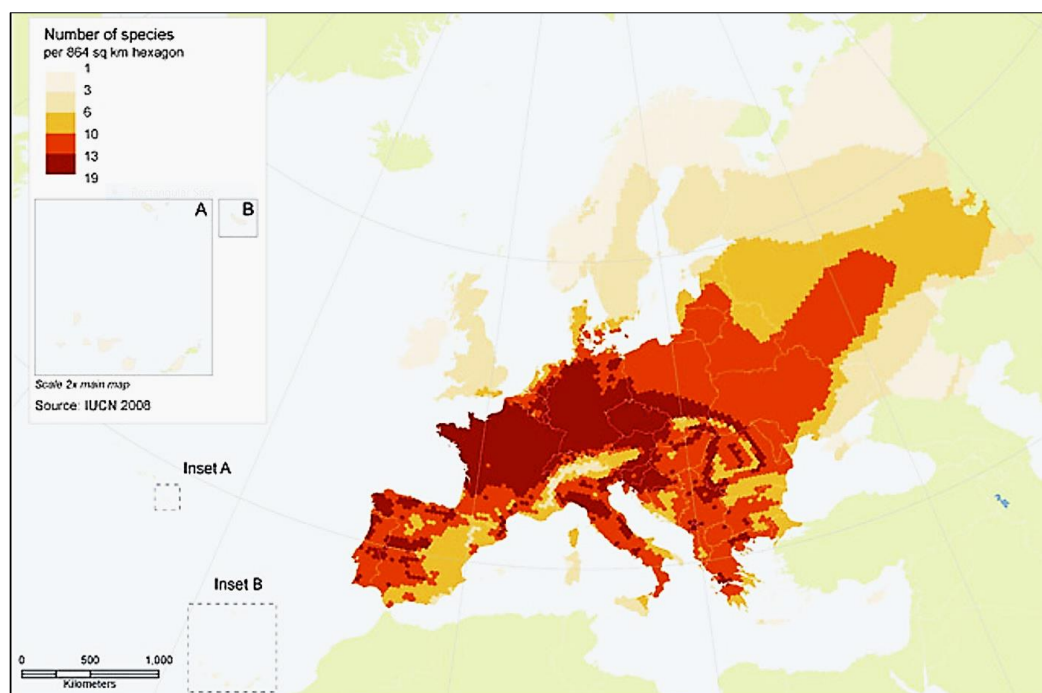


Figure 17: Species Richness of Amphibia (ecological model, by EUNIS)

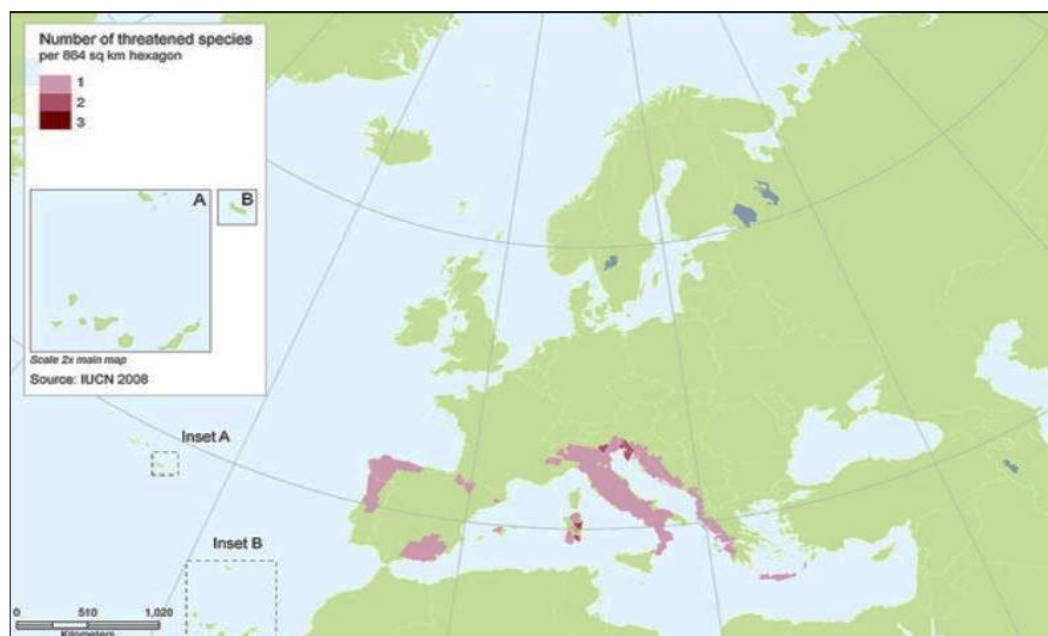


Figure 18: Number of Threatened Amphibia at European level (EUNIS)

Ten amphibian species are considered potentially present in the LSA, two of which were observed, all of them classified as Least Concern (LC) according to IUCN. No species can be considered restricted range.

One species is considered protected (P) (*Pelophylax ridibundus*) and one strictly protected (S) (*Pseudepidalea viridis*) by the Kosovo legislation.

Seven species are listed in the Habitat Directive of which two (2) species are listed in Annex II (*Bombina variegata*, *Triturus cristatus*) and all 7 species are listed in Annex IV (*Bombina variegata*, *Bufo viridis*, *Hyla arborea*, *Pseudepidalea viridis*, *Rana dalmatina*, *Rana graeca*, *Triturus cristatus*).

The complete list of species is available in Appendix A.

6.3.2.4 *Reptile species*

At European level, Kosovo is important for the conservation of reptiles: according to EUNIS, the European pattern of richness, increasing from north to south, have a peak, in Europe, right in the refugia of the Iberian, Italian and Balkan peninsulas, all important centres of diversity.

Coherently, even for maps showing the distribution of threatened reptiles in Europe, the Balkans have, according to the European Union, a relevant role for conservation. The greatest concentration of threatened species is found still in the south of Europe, with the Balkans and the Iberian Peninsula still richer than other European areas.

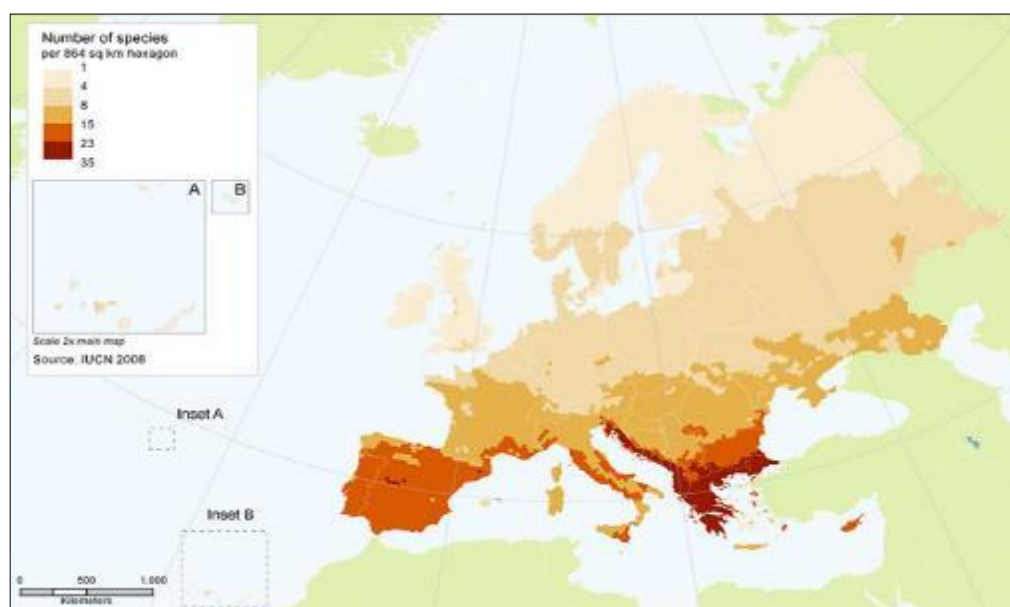


Figure 19: Pattern of diversity for reptiles at European level (EUNIS)

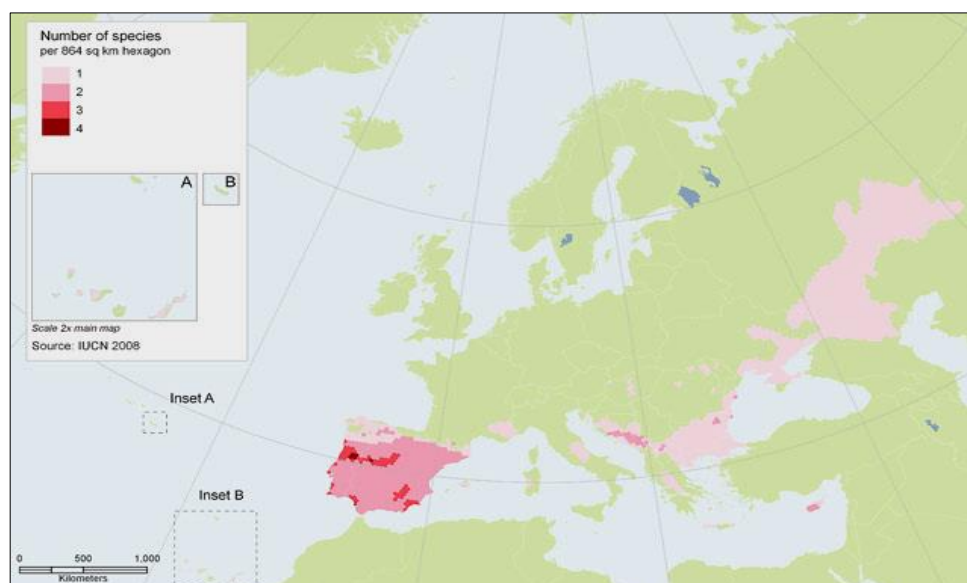


Figure 20: Species richness of threatened reptile species (EUNIS)

Twenty-one species of reptiles were considered as potentially present inside the LSA, none of them under threat according to IUCN. Six species are considered strictly protected (S) by the local legislation.

Fifteen reptile species are listed in the Habitat Directive of which one (1) species are listed in Annex II and all fifteen (15) species are listed in Annex IV.

No species can be considered endemic/restricted range.

The complete list of species is available in Appendix A.

6.3.2.5 *Bird Species*

According to EUNIS, the taxon is well represented in Kosovo, as the country is not far from the mediterranean area which is, in general a hotspot of biodiversity.

The Adriatic Flyway

The term "Adriatic Flyway" refers to the section within the Black Sea-Mediterranean Flyway that covers the Western Balkan countries. Due to its geographical location between the Adriatic Sea in the southwest and the Carpathian Mountains in the north-east it connects the wintering sites of many migratory bird species of North and Sub-Saharan Africa with breeding sites in North-Eastern and Eastern Europe (Durst & Mikuska, 2014)⁴.

⁴Romy Durst Tibor Mikuska: Hunting and bird crime along the Adriatic Flyway - a review of hunting legislation, law enforcement and driving forces. in : Sackl, P., Ferger, S.W.: Adriatic Flyway - Bird Conservation in the Balkans. Proceedings of the Second Adriatic Flyway Conference in Durres, Albania, 1 - 3 October 2014, https://www.researchgate.net/profile/Tibor_Mikuska/publication/316979671_Hunting_and_bird_crime_along_the_Adriatic_Flyway_-_a_review_of_hunting_legislation_law_enforcement_and_driving_forces/links/591b62920f7e9b7727d8a731/Hunting-and-bird-crime-along-the-Adriatic-Flyway-a-review-of-hunting-legislation-law-enforcement-and-driving-forces.pdf

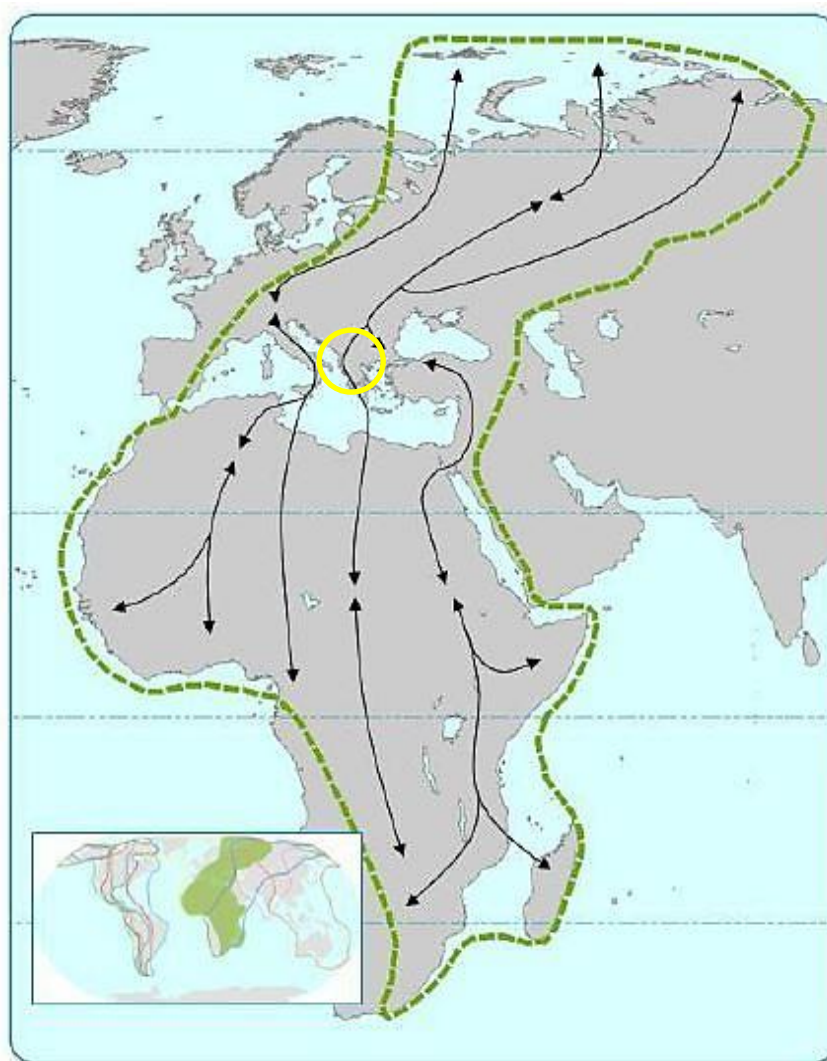


Figure 21: The Black Sea - Mediterranean flyway and the Adriatic Flyway (Data: Birdlife International: http://datazone.birdlife.org/userfiles/file/sowb/flyways/5_Mediterranean_Black_Sea_Factsheet.pdf)

Along the flyway the passage of 11.479 cranes was recorded in Spring 2010 (Stumberger & Schneider-Jacoby (2014)⁵. The same corridor is under a strong hunting pressure: Schnelder-Jacoby and Spangenberg (2010)⁶ estimated far more than 2 million birds being shot annually along the Adriatic Flyway.

The same authors report that *“despite the fact that Kosovo is located along the Adriatic Flyway, the country has not been included in this study due to the recent political and administrative changes. The existing data on*

⁵ Borut Stumberger & Martin Schneider-Jacoby (2014): Importance of the Adriatic Flyway for the common crane (*Grus grus*). in : Günter Nowald, Alexander Weber, Jane Fanke, Elke Weinhardt and Norman Donner: PROCEEDINGS of the VIIth European Crane Conference "Breeding, resting, migration and biology"

October 14-17, Stralsund, Germany

PROCEEDINGS of the VIIth European Crane Conference "Breeding, resting, migration and biology", October 14-17, Stralsund, Germany

⁶Schneider-Jacoby, M. & Spangenberg, A. (2010): Bird Hunting Along the Adriatic Flyway – an Assessment of Bird Hunting in Albania, Bosnia and Herzegovina, Croatia, Montenegro, Slovenia and Serbia. – In: Denac, D., Schneider-Jacoby, M. & Stumberger, B. (eds.). Adriatic flyway – closing the gap in bird conservation. Euronatur, Radolfzell, pp. 32–51. P.35, https://www.euronatur.org/fileadmin/docs/jagd/ADRIATIC_FLYWAY_2009_Conference_Proceedings.pdf

hunting for Kosovo are often still summarized under Serbia". Regardless of the political situation, Kosovo is thus to be considered as part covered by the flyway.

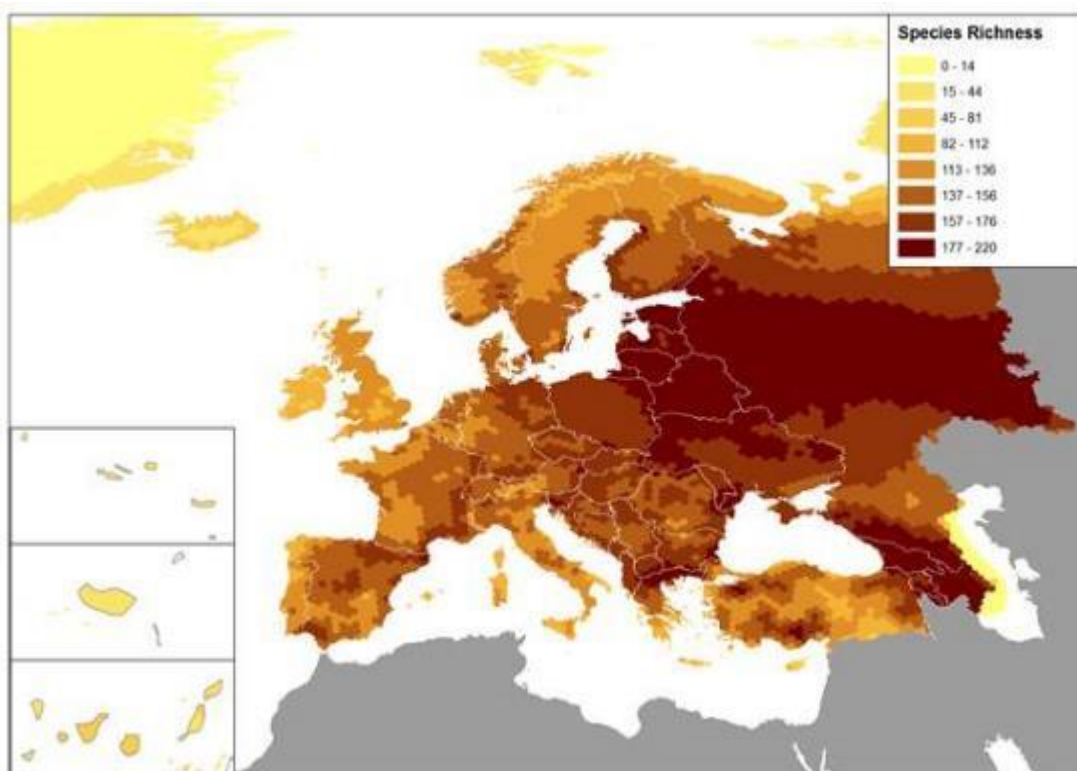


Figure 22: Species richness of birds in Europe (EUNIS)

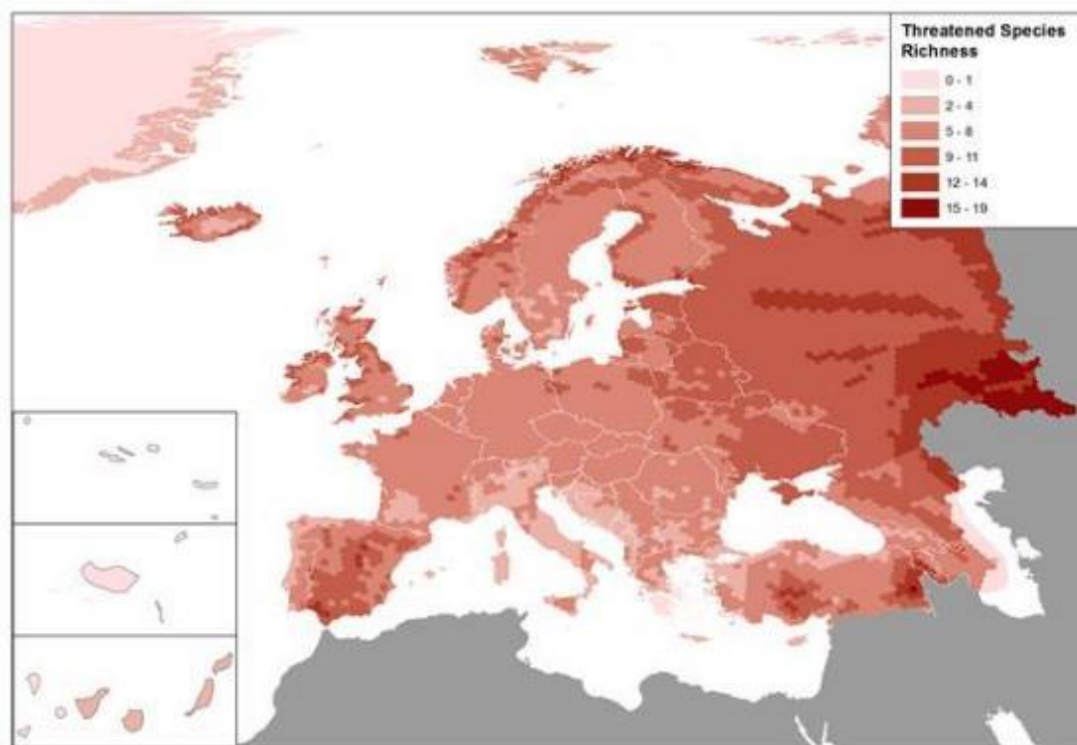


Figure 23: Density of bird threatened species at European level (EUNIS)

One hundred and fourteen (116) species of birds are potentially present in the LSA. Among them, 102 species were directly observed during the field studies. While only one is listed as threatened by IUCN (VU), 15 species are considered Protected (P) and 80 species Strictly protected (S) at national level (see appendix A).

Based on a precautionary approach, *Circus pygargus*, *Pernis apivorus* and *Milvus migrans* were inserted in the list of species present in the area, since they were observed during the 2019 VPs survey, although for Kosovo they are considered only passage species.

Fortytwo bird species are listed in the EU Birds directive, of which 23 protected by Annex I, 18 species by Annex II and one species by both Annex II and III. There are no endemic birds.

The species *Circaetus gallicus*, *Monticola saxatilis* and *Alectoris graeca*, potentially present in the LSA, are the three IBA triggering species of the Kopaonik IBA.

The complete list of bird species is available in Appendix A.

6.3.2.5.1 Nightjar Monitoring

Two surveys using transects along suitable habitats have been completed on June 19th and July 17th, 2019. During the first survey, in the first study area (near Turbines 23, 24) no nightjar activity was reported; only a Corncrake (*Crex crex*, LC) and a Tawny Owl (*Strix aluco*, LC) were recorded. In the second study area, (locality of Pisha, near Turbines 14, 15), three (3) churring males were recorded. Moreover, during bat surveys along the transect between turbines 11 and 13 two, possibly three individuals were detected. No individuals of nightjar were detected during the second survey.

6.3.2.5.2 Soaring Birds

During the fieldwork observations conducted between June and August 2019, a total of 918 soaring birds have been counted (Table 8). Based on the behaviour of each bird or flock, each observation was allocated to 'migrating' or 'resident' category. This categorization does not reflect the biology or phenology of the species at the site, but its behaviour: birds (or flocks) flying across the area in a straight line are considered 'Migrant', while those observed hunting or 'flying around' are classified as 'resident'. The same bird may be classified 'migrant' in one observation and 'resident' the next time it is recorded in the area. The two behaviours trigger different calculation methods within the Collision Risk Model.

About 77% of the total 918 birds observed in the study area were *Falco tinnunculus*, while *Buteo buteo* individuals represent the 90% of the "resident" birds in the area.

Circaetus gallicus, species which triggered the identification of the Kopaonic IBA, was observed 23 times and only in two occasions the record reported 2 individuals together.

The Pale Harrier (*Circus macrorus*), classified as NT, was observed 11 times between June and August and all observations were related to a single individual.

The Hobby (*Falco subbuteo*) is a new species for the project LSA: it was not detected in 2017, but the species was observed 20 times during 2019 field studies.

Moreover, 852 individuals were observed within 500 m from the turbine and at or below rotor height (i.e. 0-178 m) (Table 9). According to the Tafila Region Wind Power Projects - Cumulative Effects Assessment" (IFC, 2017), the VPs were selected in such a way that all together they provide a view of whole Project area and all turbines were covered and buffered to 500 m, with the viewing not exceeding 2 km. Including a 500 m buffer around each turbine reduces the potential that birds that use the flight activity area only occasionally will be missed.

Time spent by the detected species at different height is reported in Table 10.

Table 8: Total number of birds observed

| Species | Migrant | Resident | Total |
|---------------------------|------------|------------|------------|
| <i>Accipiter nisus</i> | 4 | 3 | 7 |
| <i>Aquila chrysaetos</i> | 3 | 1 | 4 |
| <i>Buteo buteo</i> | 33 | 120 | 153 |
| <i>Circaetus gallicus</i> | 11 | 13 | 24 |
| <i>Circus macrourus</i> | 1 | 10 | 11 |
| <i>Circus pygargus</i> | - | 8 | 8 |
| <i>Circus sp.</i> | 1 | 2 | 3 |
| <i>Falco peregrinus</i> | 4 | 3 | 7 |
| <i>Falco subbuteo</i> | 12 | 9 | 21 |
| <i>Falco tinnunculus</i> | 61 | 614 | 675 |
| <i>Milvus migrans</i> | 4 | - | 4 |
| <i>Pernis apivorus</i> | - | 1 | 1 |
| Total individuals | 134 | 784 | 918 |

Table 9: Number of birds at risk height and within 500m from a turbine

| Species | Migrating | Resident | Total |
|---------------------------|-----------|----------|-------|
| <i>Accipiter nisus</i> | 4 | 3 | 7 |
| <i>Aquila chrysaetos</i> | 1 | 1 | 2 |
| <i>Buteo buteo</i> | 31 | 97 | 128 |
| <i>Circaetus gallicus</i> | 4 | 11 | 15 |
| <i>Circus macrourus</i> | 1 | 10 | 11 |
| <i>Circus pygargus</i> | - | 7 | 7 |
| <i>Circus sp.</i> | 1 | 2 | 3 |
| <i>Falco peregrinus</i> | 3 | 3 | 6 |
| <i>Falco subbuteo</i> | 10 | 7 | 17 |
| <i>Falco tinnunculus</i> | 56 | 595 | 651 |

| Species | Migrating | Resident | Total |
|--------------------------|------------|------------|------------|
| <i>Milvus migrans</i> | 4 | - | 4 |
| <i>Pernis apivorus</i> | - | 1 | 1 |
| Total individuals | 115 | 737 | 852 |

Table 10: percentage of time spent at different height by the monitored soaring bird species

| Species | Below rotor height | At rotor height | Above rotor height | Below rotor height | At rotor height | Above rotor height | Below rotor height | At rotor height | Above rotor height | Below rotor height | At rotor height | Above rotor height |
|---------------------------|--------------------|-----------------|--------------------|--------------------|-----------------|--------------------|--------------------|-----------------|--------------------|--------------------|-----------------|--------------------|
| | June | | | July | | | August | | | September | | |
| <i>Accipiter nisus</i> | | | | | | | 74,07 | 25,93 | - | 60,00 | 10,00 | 30,00 |
| <i>Aquila chrysaetos</i> | - | - | - | - | - | 100,00 | 85,00 | - | 15,00 | 100,00 | - | - |
| <i>Buteo buteo</i> | 26,32 | 55,26 | 18,42 | 29,52 | 35,94 | 34,54 | 42,64 | 37,21 | 20,16 | 52,99 | 27,61 | 19,40 |
| <i>Circaetus gallicus</i> | 5,77 | 94,23 | - | 11,94 | 24,63 | 63,43 | 31,71 | 46,34 | 21,95 | 23,53 | 52,94 | 23,53 |
| <i>Circus macrourus</i> | 24,32 | 75,68 | - | 15,60 | 65,96 | 18,44 | 100,00 | - | - | - | - | - |
| <i>Circus pygargus</i> | | | | | | | 100,00 | - | - | 60,00 | 40,00 | - |
| <i>Circus sp.</i> | - | - | - | 100,00 | - | - | 100,00 | - | - | - | - | - |
| <i>Falco peregrinus</i> | 7,69 | 92,31 | - | 50,00 | - | 50,00 | - | - | - | - | - | - |
| <i>Falco subbuteo</i> | 61,90 | 38,10 | - | 25,00 | 75,00 | - | 100,00 | - | - | 71,43 | - | 28,57 |
| <i>Falco tinnunculus</i> | 77,48 | 22,52 | - | 94,23 | 5,63 | 0,14 | 82,45 | 15,07 | 2,48 | 85,81 | 11,25 | 2,94 |
| <i>Milvus migrans</i> | - | - | - | - | - | - | - | - | - | 58,33 | 41,67 | - |
| <i>Pernis apivorus</i> | - | - | - | - | - | - | 100,00 | - | - | - | - | - |

Data collected from the Vantage points were analysed in order to determine the Collision Risk with wind turbines of each bird species.

6.3.2.6 *Mammal species (other than bats)*

According to EUNIS, at European level, Kosovo has a valuable species richness. As also for other taxa (see above: reptiles), a continental gradient in species richness, increasing from north to south is recognized.

Nonetheless, according to the same sources the country hosts only an average value of threatened species.

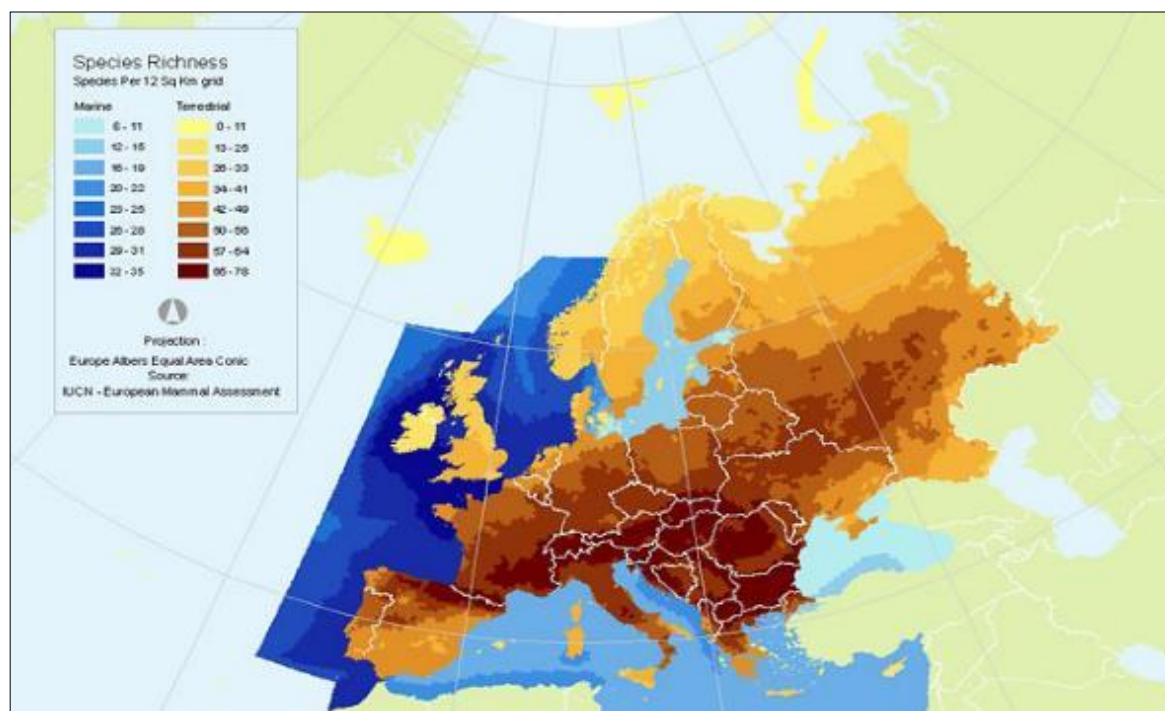


Figure 24: Species richness of mammal species in Europe (EUNIS)

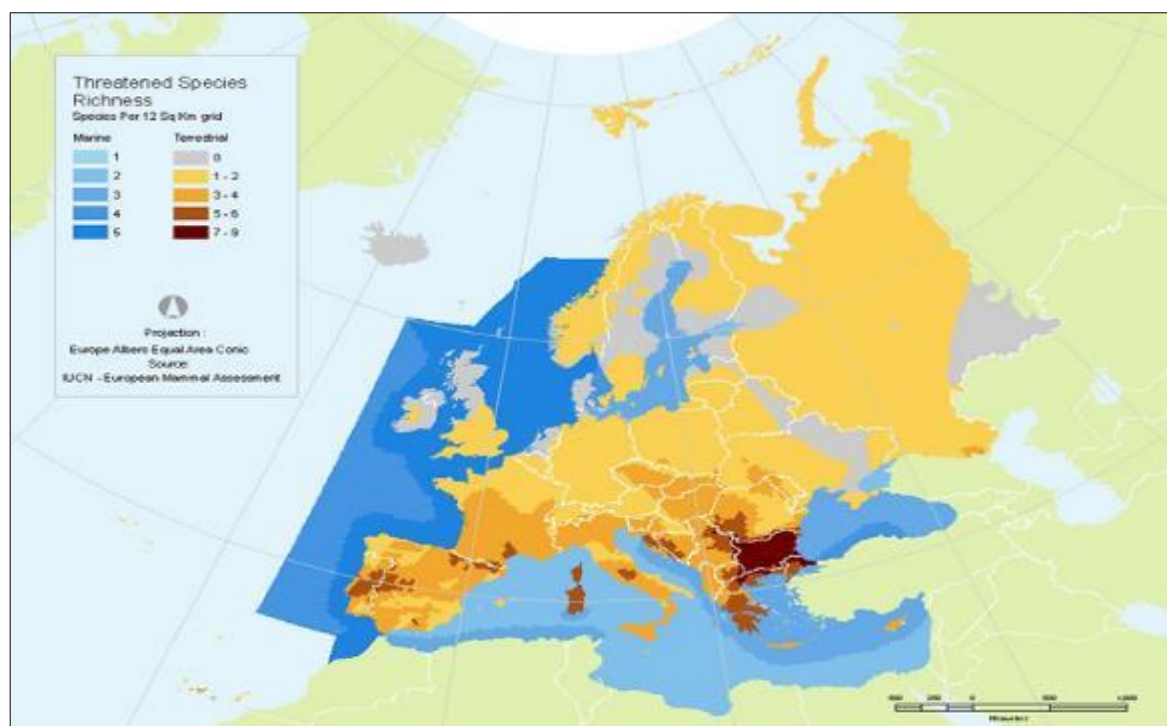


Figure 25: Richness of threatened mammal species in Europe (EUNIS)

Twenty-seven (27) mammal species (other than bats), are considered potentially present in the LSA. Only three species were directly or indirectly (footprints, burrows) observed on the field.

All the species are listed as least concern (LC) by IUCN. One species (*Erinaceus roumanicus*) is protected (P) at national level.

No species can be considered endemic/restricted range according to EBRD thresholds.

Four species are listed in the habitat directive Annex IV (*Canis lupus*, *Dryomys nitedula*, *Felis silvestris*, *Muscardinus avellanarius*) while one also in Annex II (*Canis lupus*).

The complete list of species is available in Appendix A.

6.3.2.7 Bat Species

Bats are among the most sensitive taxa among mammals and the only flying taxon in the class, thus potentially impacted by the project even in the operational phase.

All the species found in the LSA are listed in the annexes of the Habitat Directive:

- 10 species of bats are listed in Appendix II of the HD and; These species are evaluated as priority Biodiversity features by EBRD PR6 guidance notes.
- All bat species are listed in Appendix IV of the HD. These species are evaluated as potential Critical habitat triggering species according to EBRD PR6 guidance.

Natura 2000 network provides the taxon with a good coverage in terms of habitat protection and the compliance with Annex II of the Habitat directive itself. Table 19 provides a scheme of the number of Natura 2000 designated for every listed species, many of them are present in the LSA of the Bajgora wind farm project.

Kosovo is not signatory party of the UNEP/EUROBATS Agreement on the Conservation of Populations of European Bats, however its territory included as Serbia, therefore the convention is considered applicable.

According to the *Action Plan for the Conservation of All Bat Species in the European Union 2018 - 2024*, main conservation points are linked to the loss of roosts and caves and the fact that many sites are linked to buildings, thus to anthropic structures. Building insulation, building renewal and direct disturbance from inhabitants are a major disturb.

Another cause would be the change in agricultural practices, use of chemicals and pesticides in agriculture, as well as the wrong forestry practices and more in general fragmentation of habitats (even linear, often used as a guide by bats).

Table 11: Number of Natura 2000 sites designated for bat species in Europe (Data: Natura 2000 database (2014). Species interesting for the project and considered in the database are indicated;

| Bat species included in the Annex II of the Habitats Directive | | Number of sites designated for the species at the end of 2014 | Species present in the LSA |
|--|----------------------------------|---|----------------------------|
| Blasius's horseshoe bat | <i>Rhinolophus blasii</i> | 105 | |
| Mediterranean horseshoe bat | <i>Rhinolophus euryale</i> | 694 | X |
| Greater horseshoe bat | <i>Rhinolophus ferrumequinum</i> | 2007 | X |
| Lesser horseshoe bat | <i>Rhinolophus hipposideros</i> | 2070 | X |
| Mehely's horseshoe bat | <i>Rhinolophus mehelyi</i> | 186 | |
| Western Barbastelle bat | <i>Barbastella barbastellus</i> | 1493 | X |
| Bechstein's bat | <i>Myotis bechsteinii</i> | 1287 | |
| Lesser mouse-eared bat | <i>Myotis blythii</i> | 789 | X |
| Long-fingered bat | <i>Myotis capaccinii</i> | 352 | |
| Pond bat | <i>Myotis dasycneme</i> | 429 | |
| Geoffroy's bat | <i>Myotis emarginatus</i> | 1136 | X |
| Greater mouse-eared bat | <i>Myotis myotis</i> | 2963 | X |
| Schreiber's bat | <i>Miniopterus schreibersii</i> | 857 | X |
| Egyptian fruit bat | <i>Rousettus aegyptiacus</i> | 26 | |

Regarding wind turbines, while many demonstrations have long since shown the impact on birds, deadly events for bats have only really been properly documented in the late 1990'. Today, monitoring studies of bat mortality at wind energy facilities are required in many EU countries.

In general, two causes of bat deaths have been documented: collision with blades and barotraumas caused by rapid air pressure reduction near moving turbine blades. Recently monitoring techniques for estimating and mitigating mortality based on the acoustic activity and statistical models. Nevertheless, numbers of bat carcasses found by surveyors has been shown to be systematically less than the actual mortality. Many questions remain unanswered for many species, like if collisions occur fortuitously or wind turbines attract the animals. Recent studies suggest that some bats, at least from the genus *Nyctalus*, can be attracted to wind turbines. The most impacted species belong to genera *Pipistrellus*, *Nyctalus* and *Eptesicus*.

6.3.2.7.1 Species richness in the Study Area

Twentytwo bat species were counted as present in the LSA, all of them directly recorded during 2017 and 2019 fieldworks. However, the number could be greater as many acoustic sequences are identified only at the level of genus (e.g. *Plecotus* sp) or pairs of species (e.g. *Myotis myotis/blythii*).

Two species (*Myotis capaccini*, *Nyctalus lasiopterus*) are considered Vulnerable (VU) and three species (*Barbastella barbastellus*, *Miniopterus schreibersii*, *Rhinolophus euryale*) Near threatened (NT) at a global level. Moreover, three bat species (*Barbastella barbastellus*, *Myotis capaccini*, *Rhinolophus euryale*) are listed as Vulnerable (VU) at European level. No bat species can be considered endemic.

All the species are listed in the Habitat Directive, annex IV, 7 species also in the annex II of the Directive.

The complete list of species is available in Appendix A.

Table 12: Species and taxa of bats sample in 2017 and/or 2019

| Species | Global Red List IUCN | European Red List IUCN | Habitat Dir. 92/43/CEE | Sampling year |
|-----------------------------------|----------------------|------------------------|------------------------|---------------|
| <i>Barbastella barbastellus</i> | NT | VU | II, IV | 2019 |
| <i>Eptesicus serotinus</i> | LC | LC | IV | 2017 & 2019 |
| <i>Hypsugo savii</i> | LC | LC | IV | 2017 & 2019 |
| <i>Miniopterus schreibersii</i> | NT | NT | II, IV | 2017 & 2019 |
| <i>Myotis blythii</i> (uncertain) | LC | LC/NT | IV | 2017 & 2019 |
| <i>Myotis capaccini</i> | VU | VU | II, IV | 2019 |
| <i>Myotis daubentonii</i> | LC | LC | IV | 2019 |
| <i>Myotis emarginatus</i> | LC | NT | II, IV | 2017 & 2019 |
| <i>Myotis myotis</i> (uncertain) | LC | LC/NT | II, IV | 2017 & 2019 |
| <i>Myotis mystacinus</i> | LC | LC | IV | 2017 |
| <i>Nyctalus lasiopterus</i> | VU | DD | IV | 2019 |

| Species | Global Red List IUCN | European Red List IUCN | Habitat Dir. 92/43/CEE | Sampling year |
|--|----------------------|------------------------|------------------------|---------------|
| <i>Nyctalus leisleri</i> | LC | LC | IV | 2017 & 2019 |
| <i>Nyctalus noctule</i> | LC | LC | IV | 2017 & 2019 |
| <i>Pipistrellus kuhlii</i> (uncertain) | LC | LC | IV | 2017 & 2019 |
| <i>Pipistrellus nathusii</i> (uncertain) | LC | LC | IV | 2017 & 2019 |
| <i>Pipistrellus pipistrellus</i> | LC | LC | IV | 2017 & 2019 |
| <i>Pipistrellus pygmaeus</i> | LC | LC | IV | 2017 & 2019 |
| <i>Plecotus spp.</i> | LC | LC/NT | IV | 2017 & 2019 |
| <i>Rhinolophus euryale</i> | NT | VU | II, IV | 2019 |
| <i>Rhinolophus ferrumequineum</i> | LC | NT | II, IV | 2017 |
| <i>Rhinolophus hipposideros</i> | LC | NT | II, IV | 2019 |
| <i>Rhinolophus mehelyi</i> (uncertain) | VU | VU | II, IV | 2019 |
| <i>Tadarida teniotis</i> | LC | LC | IV | 2017 & 2019 |
| <i>Vespertilio murinus</i> | LC | LC | IV | 2017 & 2019 |

6.3.2.7.2 Mist Netting

No bats were caught in the mist nets deployed during either the May, June, July and August surveys; this was attributed to the low levels of bat activity recorded at ground level (<3 bat passes per hour) during both surveys.

6.3.2.7.3 Driven Transects

The species and numbers of bat passes recorded during driven transects conducted in the Study Area between May and August 2019 are shown in Table 13.

The calculated Bat Activity Index (BAI) is expressed as the number of bat passes for the lines transect length and it is shown in **Table 14**.

Table 13: Results of driven transects, May, June, July; August 2019

| Species | Transect Date | | | | | | | | | |
|---|---------------|------------|----------|-----------|-----------|-----------|------------|------------|-----------|-----------|
| | 25/05/2019 | 26/05/2019 | 7/6/2019 | 8/6/2019 | 4/07/2019 | 5/07/2019 | 16/08/2019 | 17/08/2019 | 4/09/2019 | 5/09/2019 |
| | Bat passes/km | | | | | | | | | |
| <i>Eptesicus serotinus</i> | 1 | 3 | | | | 1 | | 1 | | |
| <i>Eptesicus</i> / <i>Nyctalus</i> / <i>Vespertilio</i> sp. | 4 | 6 | | | | | | | | |
| <i>Hypsugo savii</i> | | | | 2 | | 5 | | | | |
| <i>Miniopterus schreibersii</i> | 1 | 5 | | 6 | | 3 | | | | |
| <i>Myotis myotis</i> / <i>blythii</i> | | | | | 1 | | | 1 | | |
| <i>Myotis</i> sp. | | | | | | 2 | | | | |
| <i>Nyctalus leisleri</i> | | 2 | | | | | | | 1 | 1 |
| <i>Pipistrellus pipistrellus</i> | 1 | | | 2 | | | | | | |
| <i>Pipistrellus kuhlii</i> / <i>nathusii</i> | | | | 4 | | 12 | | | | |
| <i>Plecotus</i> sp. | | | | | | | | 1 | | |
| Total bat passes | 7 | 16 | 0 | 14 | 1 | 23 | 0 | 3 | 1 | 1 |

Table 14: Bat activity index (BAI) for the transect.

| 2019 Transect Date | Transect 1 (from WTG 1 to WGT 6) | Transect 2 (from WTG 7 to WTG 13) | Transect 3 (from WTG 14 to WTG 27) |
|---------------------------|--|---|--|
| May 25 th | 1.67 | 0.35 | 0 |
| May 26 th | 0 | 0.71 | 1.31 |
| June 7 th | 0 | 0 | 0 |
| June 8 th | 0 | 0.71 | 2.6 |
| July 4 th | 0.28 | 0 | 0 |
| July 5 th | 0 | 0.35 | 3.06 |
| August 16 th | 0 | 0 | 0 |
| August 17 th | 0 | 0.71 | 0.15 |
| September 4 th | 0.28 | 0 | 0 |

| | | | |
|---------------------------|-------------|-------------|-------------|
| September 5 th | 0 | 0 | 0.15 |
| Mean | 0.22 | 0.28 | 0.73 |

The locations of bat registrations recorded during the driven transects are shown from Figure 26 to Figure 35 (acronyms are first letter of genus and first 3-4 letters of species).



Figure 26: Bat recordings on Transect 1 (May 25th – 26th).



Figure 27: Bat recordings on Transect 2 (May 25th – 26th)



Figure 28: Bat recordings on Transect 3 (May 25th – 26th)



Figure 29: Bat recordings on Transect 2 (June 7th -8th)



Figure 30: Bat recordings on Transect 3 (June 7th -8th)



Figure 31: Bat registration on Transect 1 (July 4th – 05th)

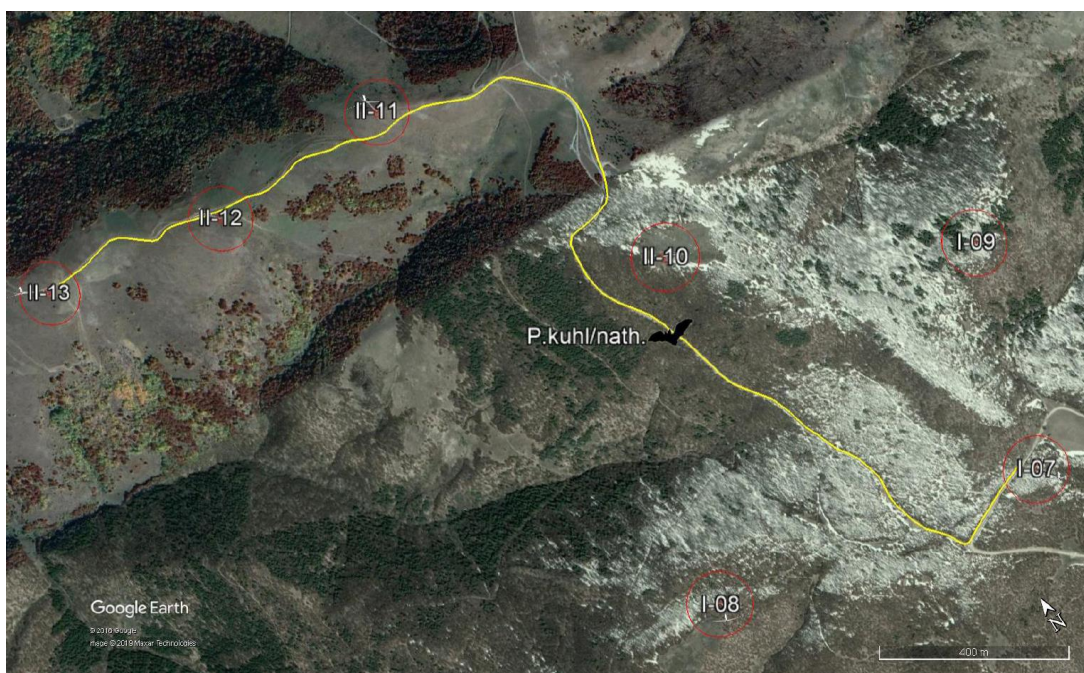


Figure 32: Bat registrations on Transect 2 (July 4th – 05th)



Figure 33: Bat registrations on Transect 3 (July 4th – 05th)



Figure 34: Bat registration on Transect 2 (August 16th – 17th)

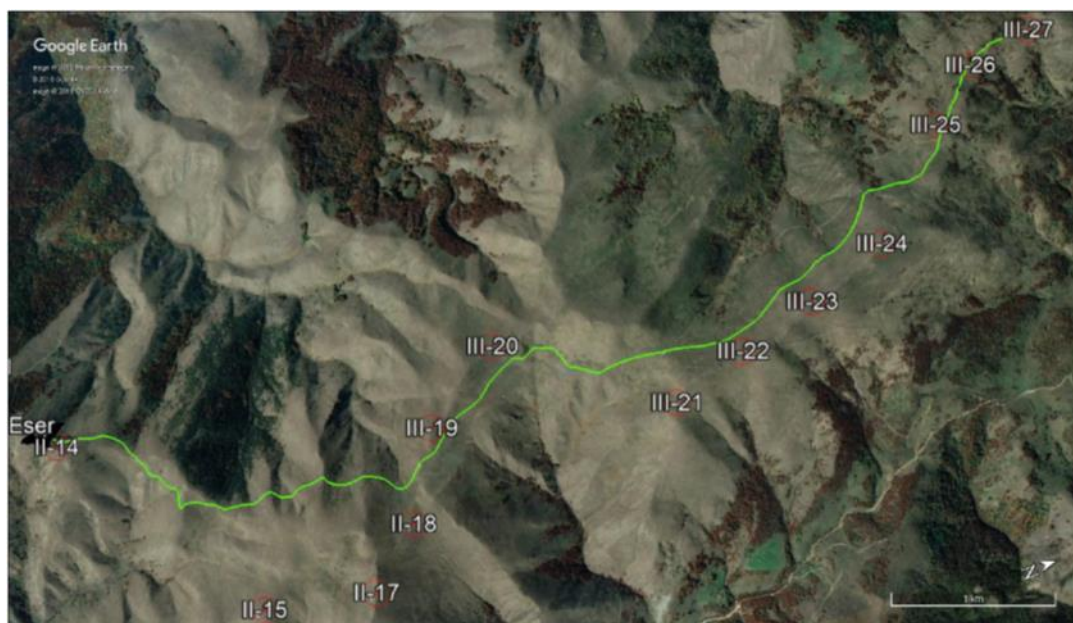


Figure 35: Bat registration on Transect 3 (August 16th – 17th)



Figure 36: Bat registration on Transect 1 (September 4th – 5th)

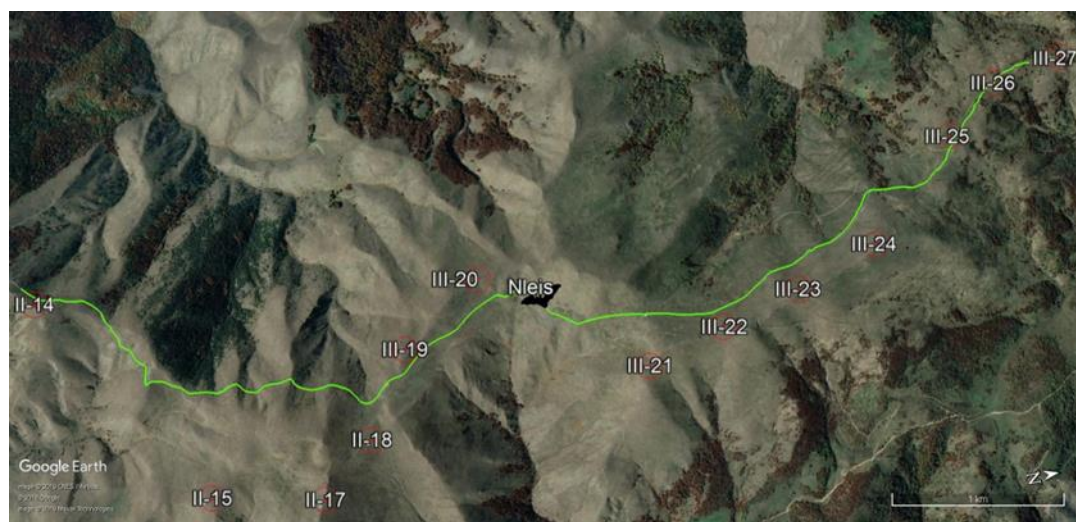


Figure 37: Bat registration on Transect 3 (September 4th – 5th)

6.3.2.7.4 Static Acoustic Monitoring

The number of bat passes recorded at the static acoustic monitoring locations during May, June, July and August 2019 surveys are summarised in Table 15.

Table 15: Total bat passes (height and ground level jointly) recorded at the static acoustic monitoring in the weather Masts. May, June, July, August and September 2019

| Species | Number of bat pass records | | | | | | | | | | |
|---|----------------------------|------|------|--------|-----------|-----|------|------|--------|-----------|-------|
| | MM1 | | | | | MM2 | | | | | Total |
| | May | June | July | August | September | May | June | July | August | September | |
| <i>Barbastella barbastellus</i> | 1 | | | | | | | | | | 1 |
| <i>Eptesicus serotinus</i> | 2 | 9 | | 1 | | | | | 13 | | 25 |
| <i>Hypsugo savii</i> | 2 | 7 | 31 | | 2 | 23 | | 53 | 1 | | 118 |
| <i>M.myotis/blythii</i> | | 1 | 1 | 2 | | 1 | | 2 | | | 7 |
| <i>Miniopterus schreibersii</i> | 4 | 3 | 1 | | | | 3 | | | | 11 |
| <i>M. schreibersii</i> / <i>P. pipistrellus</i> | | | 2 | | | | | 3 | 1 | | 6 |
| <i>Myotis</i> sp. | 2 | | 10 | 9 | 1 | | 1 | 1 | 3 | 1 | 28 |
| <i>Myotis</i> sp/ <i>Plecotus</i> sp | | | | 8 | 1 | | | | | | 9 |

| Species | Number of bat pass records | | | | | | | | | | |
|---------------------------------------|----------------------------|------------|------------|-----------|-----------|------------|------------|------------|------------|-----------|-------------|
| | MM1 | | | | | MM2 | | | | | Total |
| | May | June | July | August | September | May | June | July | August | September | |
| <i>Nyctalus lasiopterus</i> | 15 | 4 | 2 | | | 6 | 19 | | | | 46 |
| <i>Nyctalus leisleri</i> | 30 | 73 | 49 | 20 | 50 | 33 | 20 | 46 | 39 | 42 | 402 |
| <i>Nyctalus noctula</i> | 13 | 2 | | | 6 | 21 | 3 | | 2 | 5 | 52 |
| <i>Nyctalus noctula/lasiopterus</i> | 3 | 1 | 1 | 2 | | 6 | | | | | 13 |
| <i>Nyctalus/Eptesicus</i> | | | | 2 | 12 | | | 7 | 16 | 14 | 51 |
| <i>Nyctalus/Vespertilio</i> | 4 | 12 | 8 | 4 | | 4 | 5 | 11 | 2 | 1 | 51 |
| <i>Nyctalus/Eptesicus/Vespertilio</i> | | | | | 1 | | | | | | 1 |
| <i>P.kuhlii/nathusii</i> | | 1 | 10 | | 6 | 1 | 2 | 26 | 5 | 3 | 54 |
| <i>Pipistrellus pipistrellus</i> | | | 1 | 1 | | 2 | 10 | 24 | | | 38 |
| <i>Pipistrellus pygameus</i> | | | | 3 | | | | | 3 | | 6 |
| <i>Plecotus sp.</i> | | 3 | | 18 | 10 | | | | 12 | 1 | 44 |
| <i>Tadarida teniotis</i> | | 96 | 1 | | | 4 | 133 | | | | 234 |
| <i>Vespertilio murinus</i> | 1 | 6 | | 2 | | 1 | | | 6 | 2 | 18 |
| <i>Total passes</i> | 77 | 218 | 117 | 72 | 88 | 102 | 196 | 173 | 103 | 69 | 1215 |

Table 16: Total bat passes recorded at the static acoustic monitoring in the turbine location. May, June, July, August and September 2019

| Species | Number of bat pass records | | | | | | | | | | | | | | | |
|---|----------------------------|------|------|--------|-----------|-------|------|------|--------|-----------|------|------|------|--------|-----------|-------|
| | WTG1 | | | | | WTG13 | | | | | WTG6 | | | | | Total |
| | May | June | July | August | September | May | June | July | August | September | May | June | July | August | September | |
| <i>Eptesicus serotinus</i> | | | | | 1 | | 3 | | 4 | 3 | 4 | | 1 | | 1 | 17 |
| <i>Hypsugo savii</i> | | | 1 | | | | 11 | 9 | | | | 1 | 2 | | | 24 |
| <i>M. myotis/blythii</i> | | 42 | | | | 1 | 2 | 6 | 2 | 2 | 12 | 3 | 10 | 1 | 2 | 83 |
| <i>Miniopterus schreibersii</i> | 18 | | | 1 | | 2 | 118 | 166 | 4 | 2 | 7 | 2 | 9 | | | 329 |
| <i>M. schreibersii</i> / <i>P. pipistrellus</i> | | | 1 | | 1 | | 24 | 137 | 2 | 4 | | | 3 | | 2 | 174 |
| <i>Myotis emarginatus</i> | | | | 1 | | | | | | | | | | 1 | 1 | 3 |
| <i>Myotis</i> sp. | 6 | 6 | 1 | | | | 1 | 10 | 3 | | 45 | 3 | 2 | 1 | 2 | 80 |
| <i>Nyctalus lasiopterus</i> | 15 | 1 | 2 | | | 3 | | 2 | | | 14 | 1 | 3 | | | 41 |
| <i>Nyctalus leisleri</i> | 5 | | 3 | | 4 | 7 | 8 | 5 | 1 | 6 | 16 | 3 | | | 3 | 61 |
| <i>Nyctalus noctula</i> | | | | | 3 | | | 2 | | 1 | 1 | 3 | | | | 10 |
| <i>Nyctalus noctula/lasiopterus</i> | 2 | | | | | 2 | 3 | 4 | | | 7 | | 1 | | 3 | 22 |
| <i>Nyctalus/Eptesicus</i> | | | | | | | | | | 2 | 1 | | | 1 | | 4 |
| <i>Nyctalus/Vespertilio</i> | 1 | | 1 | | 1 | 7 | 12 | 3 | | 2 | 2 | | 5 | | 3 | 37 |
| <i>P. kuhlii/nathusii</i> | 2 | | 3 | | | 5 | 1 | 13 | 1 | 2 | 14 | 1 | 6 | | 4 | 52 |
| <i>Pipistrellus pipistrellus</i> | | 1 | | | | | 349 | 85 | 1 | | | | 1 | | | 437 |
| <i>Pipistrellus pygmaeus</i> | | | | 1 | | | | | 1 | | | | | | 1 | 3 |
| <i>Plecotus</i> sp. | 1 | | 1 | | | | | | 1 | | | | 1 | | 1 | 5 |
| <i>Rhinolophus euryale</i> | | 2 | | 1 | 3 | | 1 | 1 | 7 | 3 | 3 | 1 | | | 7 | 29 |

| Species | Number of bat pass records | | | | | | | | | | | | | | | |
|----------------------------------|----------------------------|-----------|-----------|----------|-----------|-----------|------------|------------|-----------|-----------|------------|-----------|-----------|----------|-----------|-------------|
| | WTG1 | | | | | WTG13 | | | | | WTG6 | | | | | Total |
| | May | June | July | August | September | May | June | July | August | September | May | June | July | August | September | |
| <i>Rinolophus ferrumnequinum</i> | | | | | | | | | | | | | | 1 | | 1 |
| <i>Rhinolophus hipposideros</i> | | | | 1 | | | | | 1 | | | | | | | 2 |
| <i>R. hippo./euryale/mehelyi</i> | | | | | | | | | | | 1 | | | | | 1 |
| <i>Tadarida teniotis</i> | | 1 | | | | | 14 | 1 | | | 3 | | | | | 19 |
| <i>Vespertilio murinus</i> | | | | | | | | 1 | | | | | | | | 1 |
| Total passes | 50 | 53 | 13 | 5 | 13 | 27 | 547 | 445 | 28 | 27 | 130 | 18 | 44 | 5 | 30 | 1435 |

The chart below shows the activity detected based on acoustic behavior. It is considered social activity the percentage of acoustic sequences with presence of social calls (Pfalzer, G., & Kusch, J. (2003). Structure and variability of bat social calls: implications for specificity and individual recognition. *Journal of Zoology*, 261), foraging the percentage of acoustic sequences with presence of feeding buzz (Griffin, D.R., Webster, F.A., Michael, C.R., 1960. The echolocation of flying insects by bats. *Anim. Behav.* 8) and transit the percentage of acoustic sequence with only echolocation signals without social calls or feeding buzz.

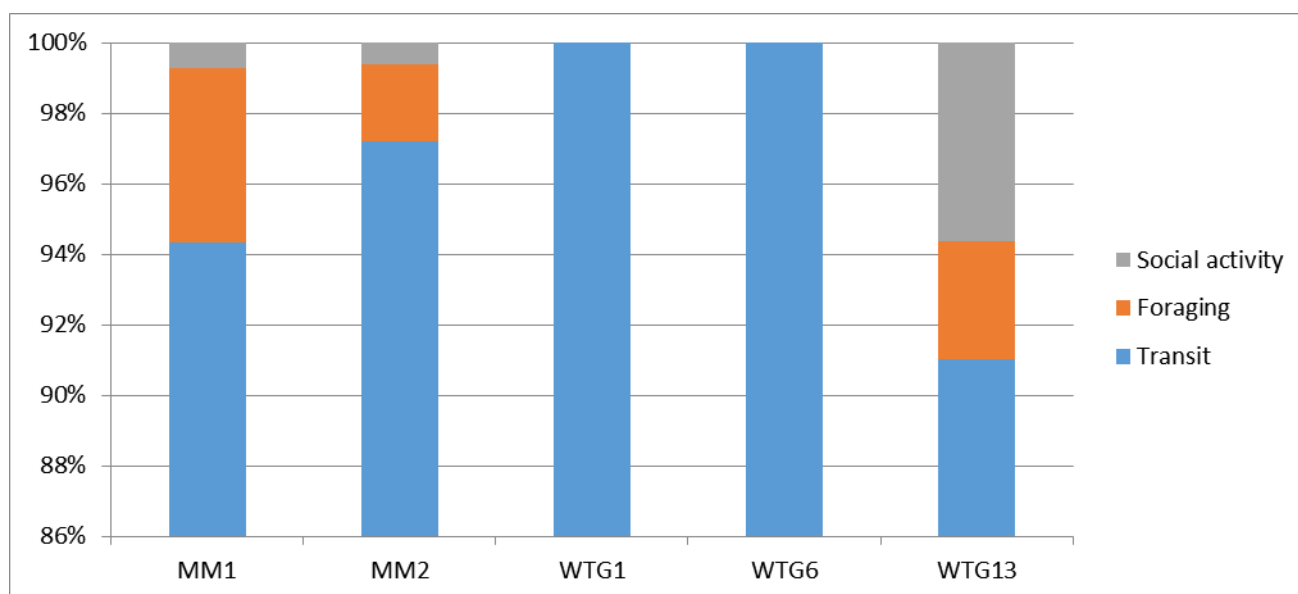
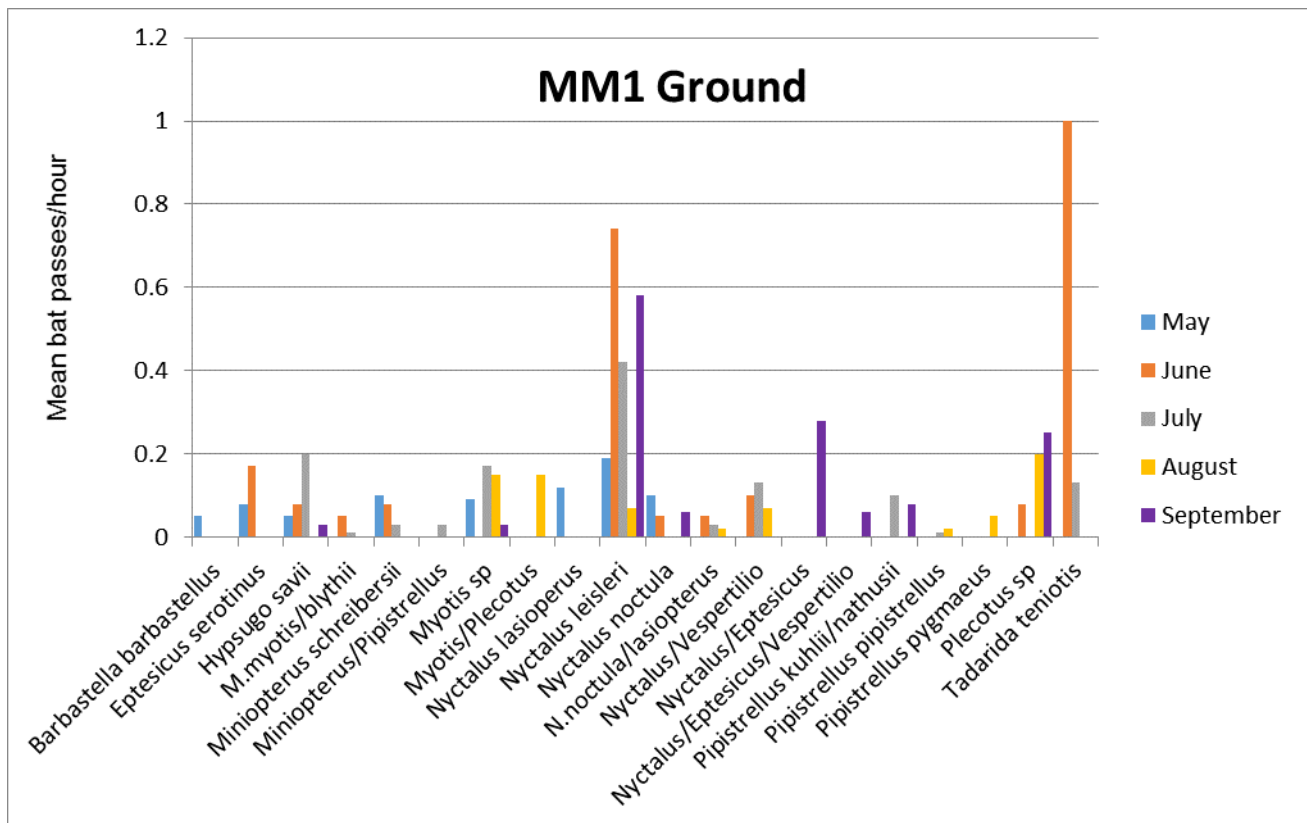


Figure 38: Percentage of bats activity recorded in the survey points**6.3.2.7.5 Bat Activity****6.3.2.7.5.1 Meteorological masts****At Ground**

Bat species and activity levels recorded to date at MM1 and MM2 at ground level are shown in Figure 39 and Figure 40.

- Bat activity was generally low, with less than 2 bat passes per hour being recorded for all species.
- The most frequently recorded species was *Tadarida teniotis*, for which 1 and 1.3 mean bat passes per hour at MM1 and MM2 respectively were recorded in June, with subsequent decrease in July and absence in August.
- *Nyctalus leisleri* was the second-most frequently encountered species at these locations.
- Activity of genus *Pipistrellus* (*Pipistrellus kuhlii/nathusii* and *Pipistrellus pipistrellus*) increase in July and decrease in August and September

**Figure 39: MM1 - Bat activity at ground level during May, June, July, August and September 2019 monitoring**

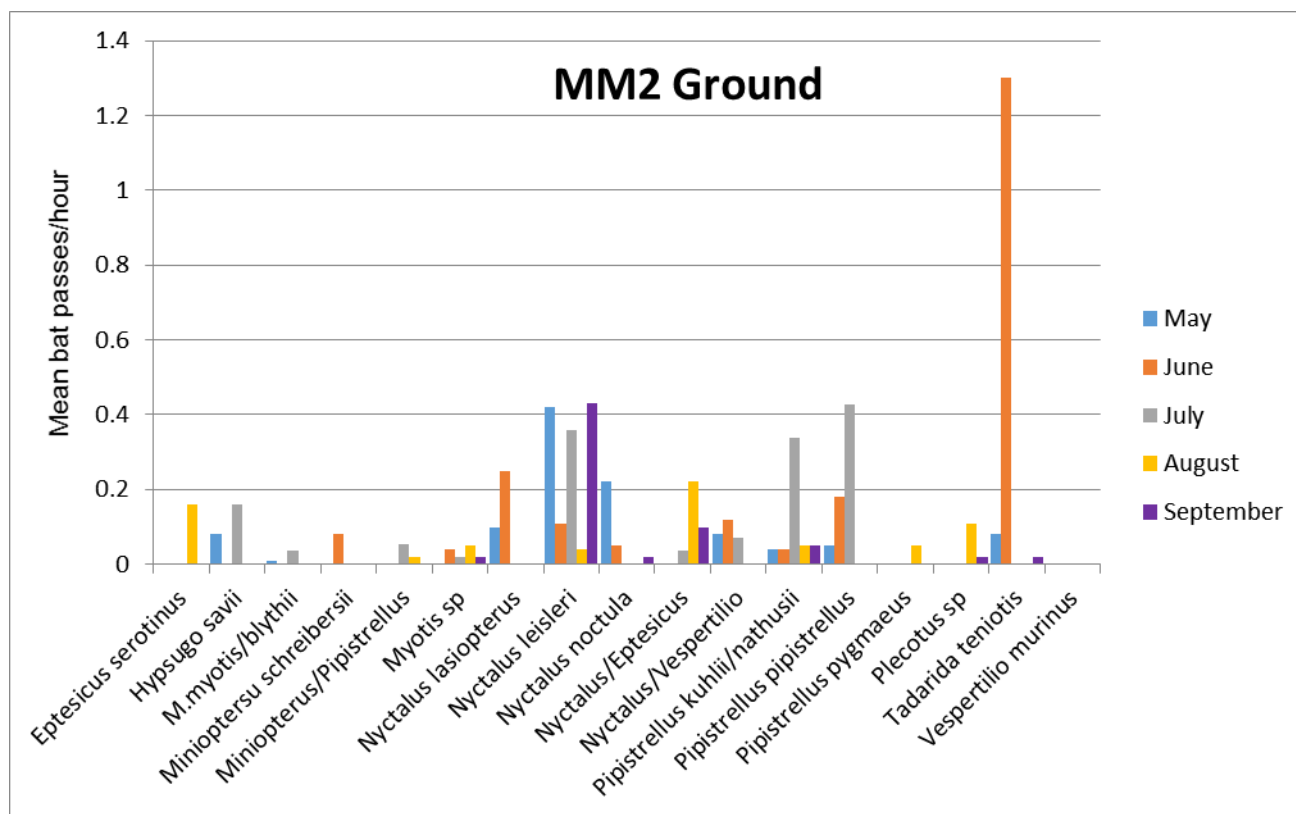


Figure 40: MM2 - Bat activity at ground level during May, June, July, August and September 2019 monitoring

At Height

Bat species and activity levels recorded to date at MM1 and MM2 at height (40 m) are shown in Figure 41 and Figure 42.

- Bat activity was generally low, with less than 2 bat passes per hour being recorded for all species.
- Significantly increased *T. teniotis* activity was recorded in June, with subsequent decrease in July and absence in August and September.
- Significantly increased *N. leisleri* activity was recorded in June at MM1, with subsequent decrease in July and increase in August and September in MM1 and MM2.
- Significant increase in *H. savii* activity in July and decrease in August and September.
- Significant decrease in *N. lasiopterus* activity from June to August.
- Presence of *V. murinus* in the migratory period (May - early June and August-September).

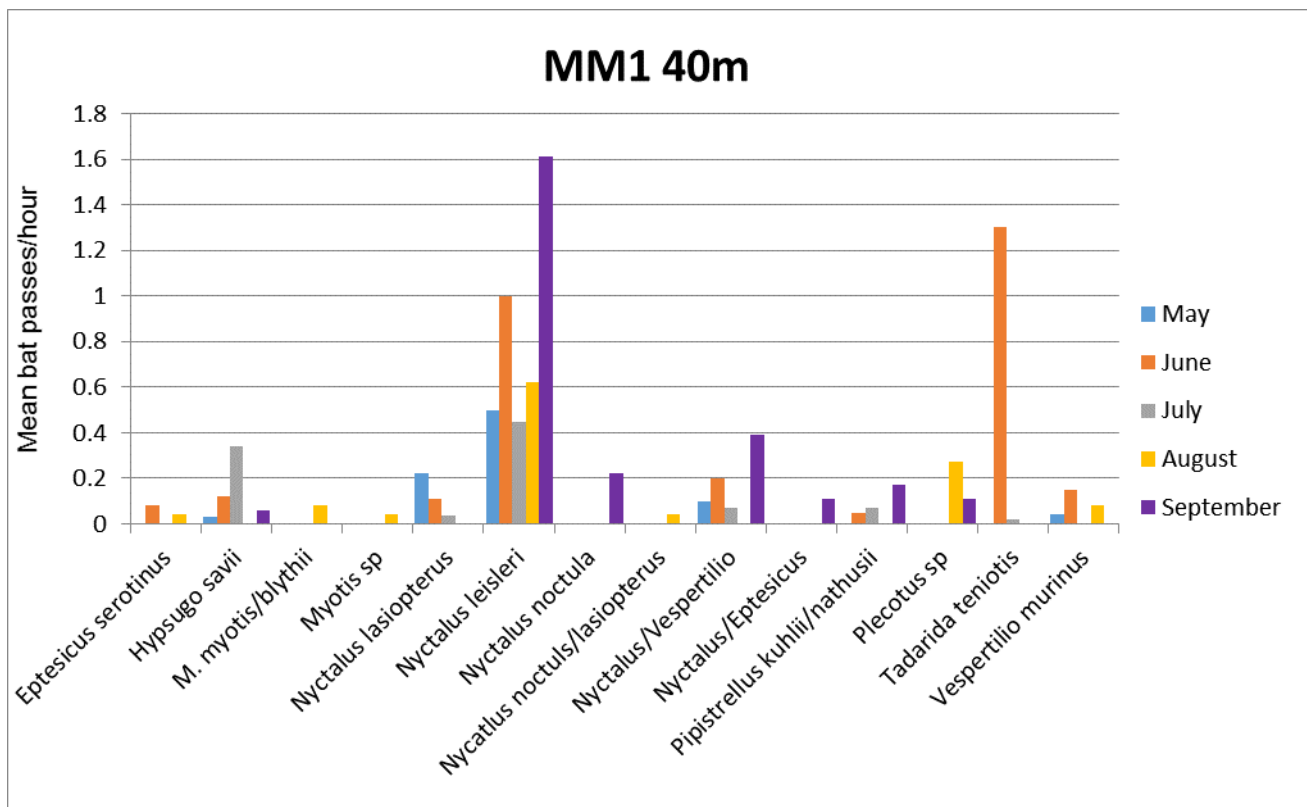


Figure 41: MM1: Bat activity at height during May, June, July, August and September 2019 monitoring

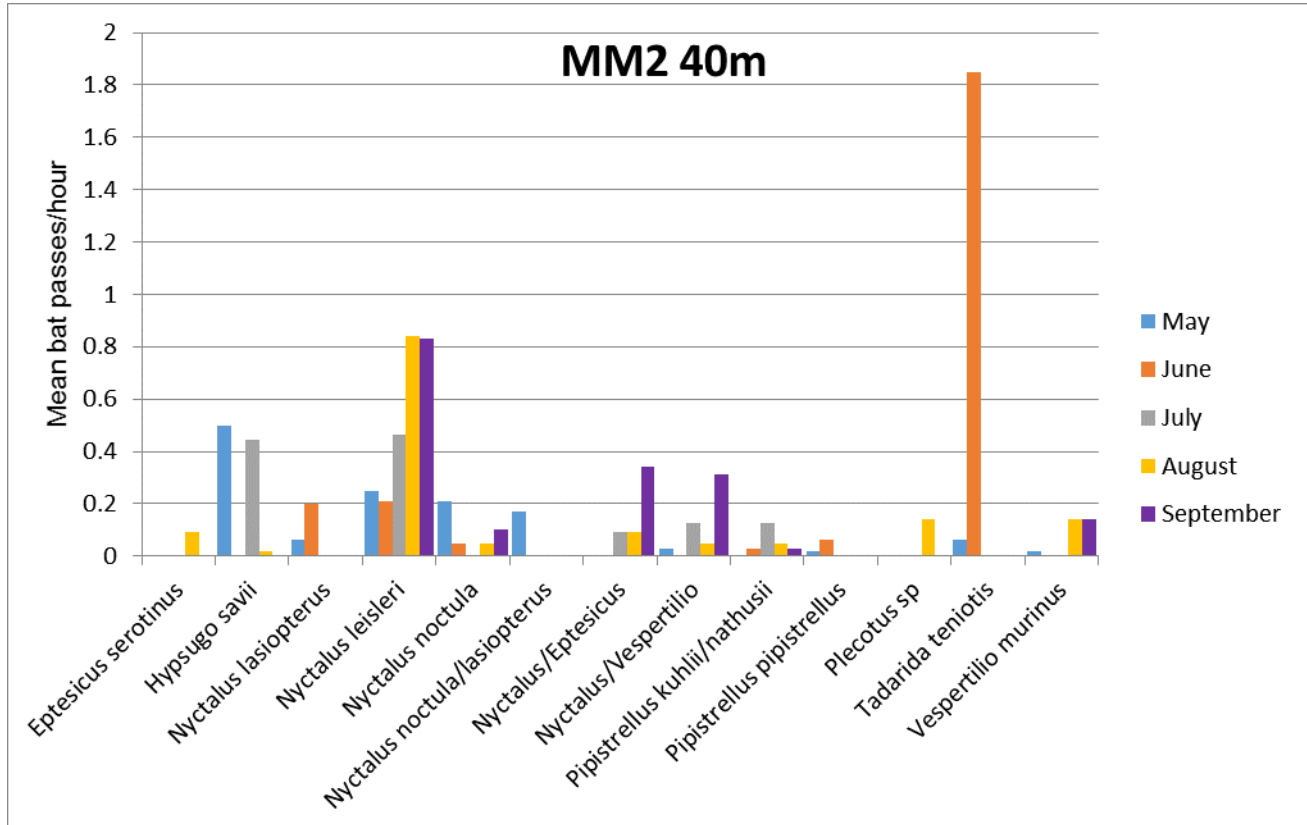


Figure 42: MM2: Bat activity at height during May, June, July, August and September 2019 monitoring

6.3.2.7.5.2 Turbine Locations

Bat species and activity levels recorded to date at WTG1, WTG6 and WTG13 at ground level are shown in Figure 43, Figure 44 and Figure 45.

- Bat activity was generally low at WTG1 and WTG 6 during both July, August and September and with less than 2 bat passes per hour being recorded for all species.
- Slightly increased bat activity was evident at WTG6 in May compared to June, July, August and September.
- Moderate levels of *Miniopterus schreibersii* activity were recorded at WTG13 in June and high in July and low in August and September.
- High levels of *Pipistrellus pipistrellus* activity were recorded at WTG13 in June, moderate in July and low in August and September.

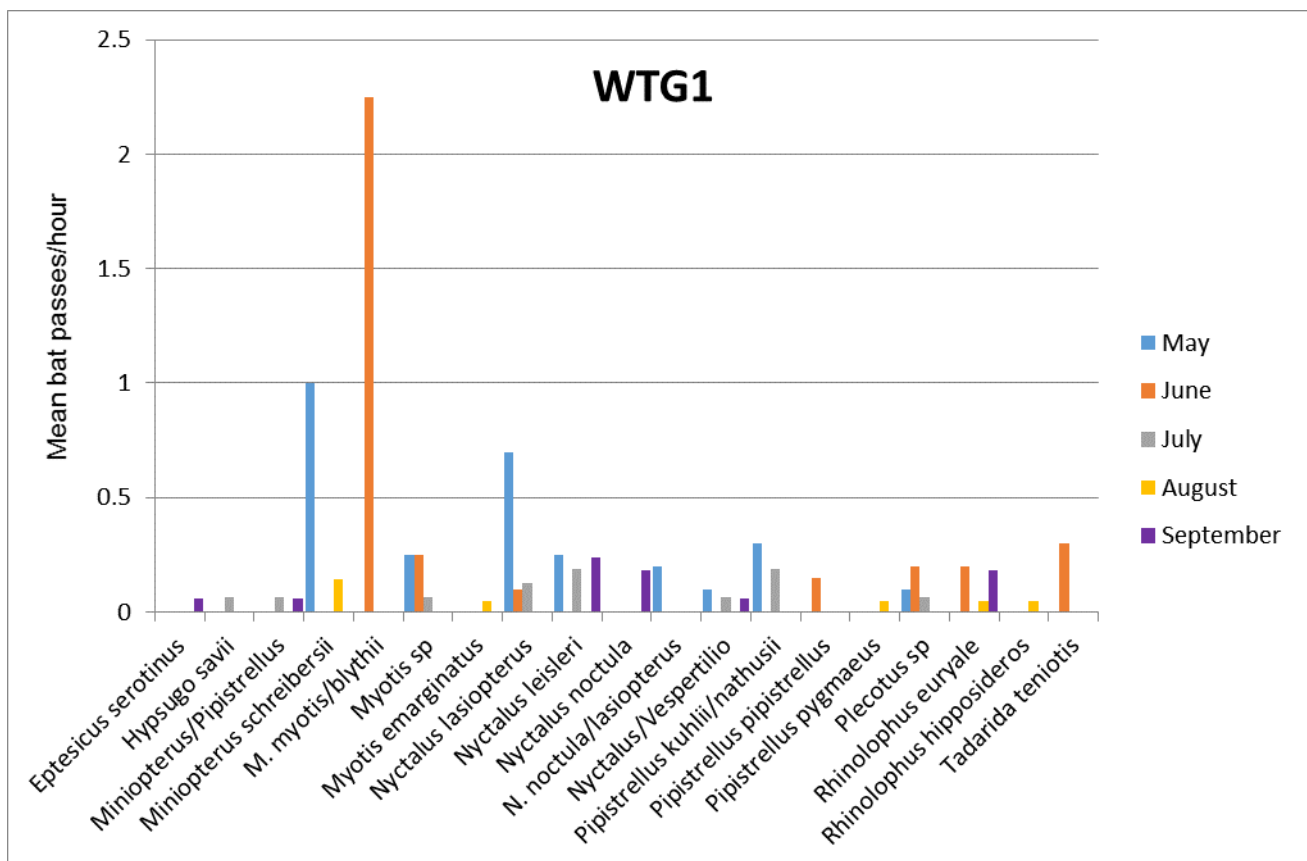


Figure 43: WTG1 - Bat activity at ground level during May, June, July, - August and September 2019 monitoring

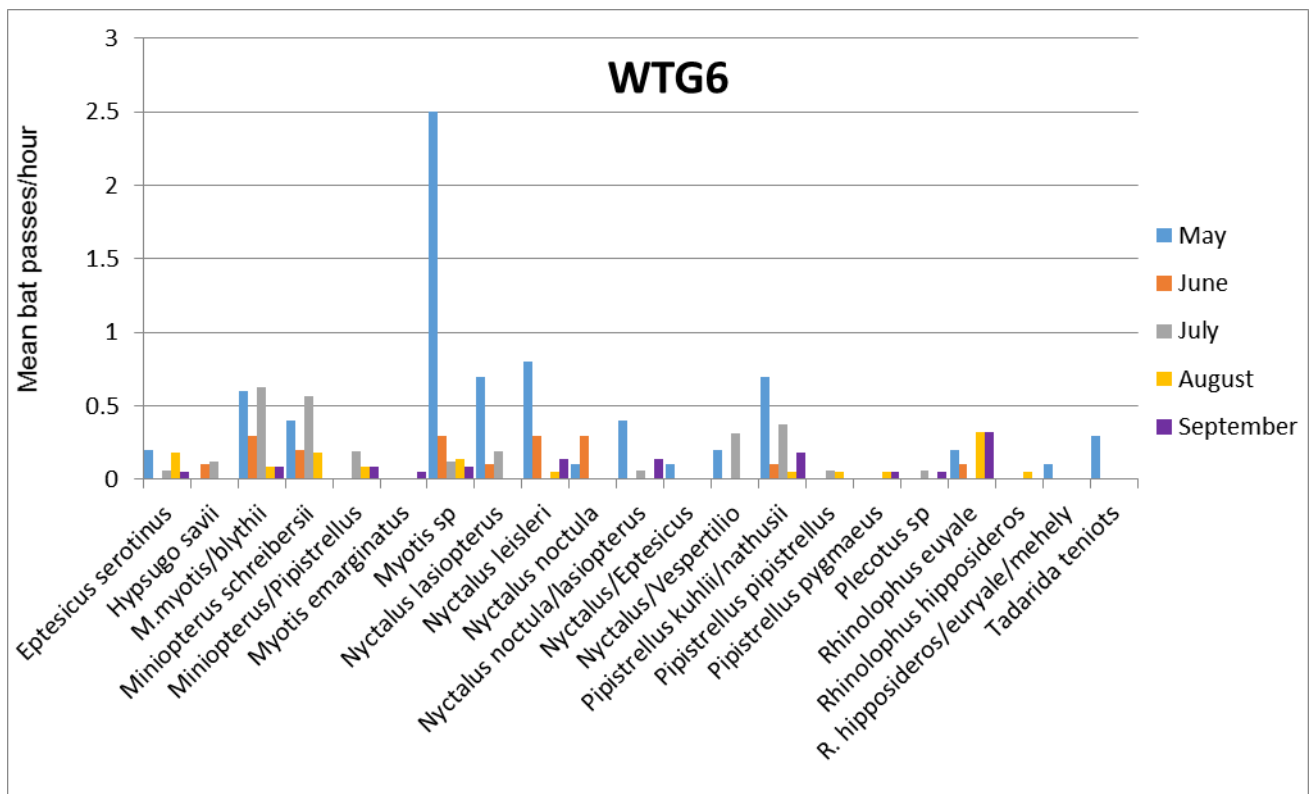


Figure 44: WTG6 - Bat activity at ground level during May, June, July, August and September 2019 monitoring

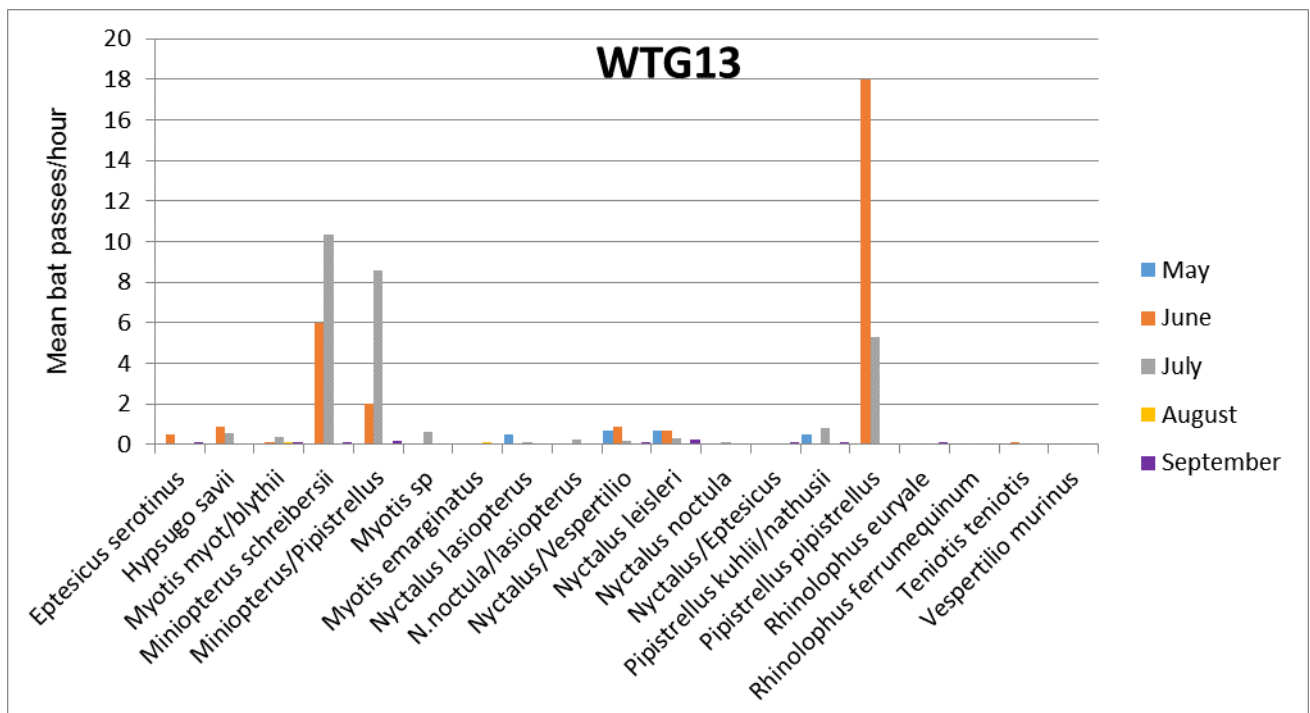


Figure 45: WTG13 - Bat activity at ground level during May, June, July, August and September 2019 monitoring

A comparison of each of the turbine locations in terms of activity levels and numbers of species recorded is drawn in Figure 46.

- Species richness was generally similar between the different turbines, with the greatest number of species recorded at WTG6.
- The greatest levels of consolidated bat activity in May, June, July and low in August and September were recorded at WTG 13, driven by the high levels of *P. pipistrellus* and *M. schreibersii* activity recorded there during June and July 2019 (see Figure 47).

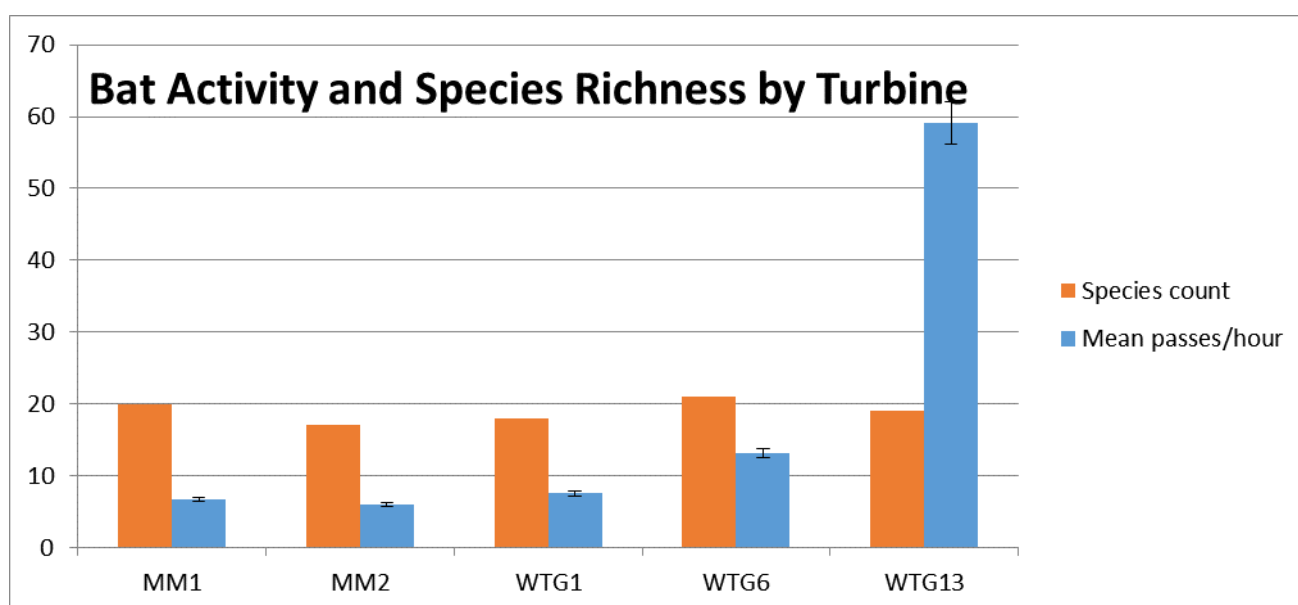


Figure 46: bat activity across monitoring locations during May, June, July, August and September 2019 monitoring

6.3.2.7.5.3 Habitats

A comparison of each of the habitats in the Study Area in terms of activity levels and numbers of species recorded is drawn in Figure 47.

- Species richness was generally similar across the different habitats within the Study Area.
- The highest levels of consolidated bat activity in May and June were recorded at locations that were characterised by a E1.7 Closed non-Mediterranean dry acid and neutral grassland with G1.691 South-western Moesian beech forests (coppice) occurring nearby; i.e. at WTG1 and WTG 13.

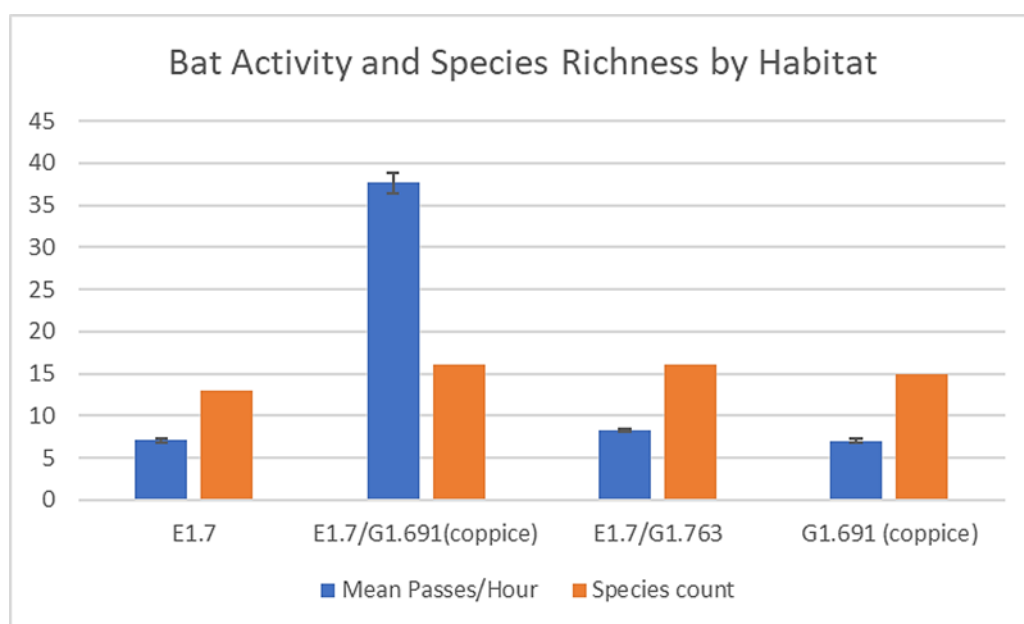


Figure 47: bat activity across habitats during May, June, July, August and September 2019 monitoring

6.3.2.7.6 Bat Species Activity

The mean activity detected in the five months of the survey (May, June, July, August and September) for all monitoring points (MM1, MM2, WTG1, WTG6 AND WTG13), while it is below average in the other months. The transects have an activity below the average, as do the MM, WTG1 and WTG6 points. MM2 presents an activity around the average, while WTG13 is much higher than the average.

Table 17: Mean bat passes/hour (all species) for all monitoring points/transect and month

| | May | June | July | August | September | Mean |
|-------------------|-------------|-------------|-------------|-------------|-------------|--------------|
| Transect 1 | 0,83 | 0 | 0,14 | 0 | 0,14 | 0,22 |
| Transect 2 | 0,53 | 0,35 | 0,17 | 0,35 | 0 | 0,28 |
| Transect 3 | 0,65 | 1,3 | 1,53 | 0,07 | 0,07 | 0,72 |
| MM1 | 1,83 | 5,19 | 2,79 | 1,71 | 2,10 | 2,72 |
| MM2 | 2,43 | 4,67 | 4,12 | 2,45 | 1,64 | 3,06 |
| WTG1 | 3,13 | 3,31 | 0,81 | 0,31 | 0,81 | 1,68 |
| WTG6 | 8,13 | 1,13 | 2,75 | 0,31 | 1,88 | 2,84 |
| WTG13 | 1,69 | 34,19 | 27,81 | 1,75 | 1,69 | 13,43 |
| Mean | 2,40 | 6,27 | 5,01 | 0,87 | 1,04 | 3,12 |

Species with higher activity values in descending order are: *N. leisleri*, *P. pipistrellus*, *T. teniotis* and *M. schreibersii*.

The comparison of the monthly mean of bat passes recorded for each species detected in the three months of surveys at the various monitoring points, with an activity reference calculated for some European states (<http://www.vigienature.fr/sites/vigienature/files/documents/referentielsvc.pdf>), allows providing an interpretation on the activity of bats detected at Selac area in May, June, July, August and September according to the following criteria (in the table is also added the genus *Myotis* sp.):

- activity greater than Q98 = very high activity;
- activity greater than Q75 = high activity;
- activity greater than Q25 = moderate activity;
- activity below than Q25 = low activity.

For this comparison the number of acoustic contacts (bat passes) has been multiplied by the detectability coefficients as recommended by Eurobats guideline (Rodrigues, L., Bach, L., Dubourg-Savage, M. J., Karapandža, B., Kovač, D., Kervyn, T., ... & Harbusch, C. (2015). Guidelines for consideration of bats in wind farm projects: Revision 2014. UNEP/EUROBATS).

Table 18: Evaluation of the level of activity (mean bat passes/month) detected in the study area (point MM1, MM2, WTG1, WTG6 and WTG13).

| Species | Reference activity | | | MM1 | MM2 | WTG1 | WTG6 | WTG13 | Total | Activity evaluation |
|---------------------------------|--------------------|-----|-----|------|------|------|------|-------|-------|---------------------|
| | Q25 | Q75 | Q98 | | | | | | | |
| <i>M. myotis / blythii</i> | 1 | 2 | 3 | 1.0 | 0.8 | 10.5 | 7.0 | 3.3 | 3.9 | very high activity |
| <i>Miniopterus schreibersii</i> | 2 | 6 | 26 | 1.3 | 0.5 | 3.2 | 3.0 | 48.5 | 9.6 | high activity |
| <i>Nyctalus lasiopterus</i> | 1 | 5 | 20 | 0.9 | 0.9 | 0.6 | 0.6 | 0.2 | 0.7 | low activity |
| <i>Nyctalus leisleri</i> | 2 | 14 | 185 | 13.8 | 11.2 | 0.7 | 1.4 | 1.7 | 6.9 | moderate activity |
| <i>Tadarida teniotis</i> | 3 | 6 | 85 | 4.1 | 4.7 | | 0.1 | 0.5 | 2.6 | low activity |
| <i>Hypsugo savii</i> | 3 | 14 | 65 | 5.2 | 9.7 | 0.1 | 0.4 | 2.5 | 4.9 | moderate activity |
| <i>Eptesicus serotinus</i> | 2 | 9 | 69 | 1.5 | 1.6 | 0.1 | 0.8 | 1.3 | 1.2 | low activity |
| <i>Myotis sp.</i> | 1 | 6 | 33 | 11.0 | 3.0 | 6.5 | 26.5 | 7.0 | 10.1 | high activity |
| <i>Nyctalus noctula</i> | 3 | 11 | 174 | 1.1 | 1.6 | 0.2 | 0.2 | 0.3 | 0.7 | low activity |
| <i>Plecotus sp.</i> | 1 | 8 | 64 | 3.9 | 1.6 | 0.3 | 0.3 | 0.1 | 1.5 | moderate activity |
| <i>Rhinolophus euryale</i> | 1 | 5 | 57 | | | 3.0 | 5.5 | 6.0 | 4.8 | moderate activity |
| <i>Vespertilio murinus</i> | 1 | 3 | 34 | 1.1 | 0.9 | | | 0.1 | 0.5 | low activity |
| <i>Barbastella barbastellus</i> | 1 | 15 | 406 | 0.3 | 0.0 | | | | 0.2 | low activity |

| Species | Reference activity | | | MM1 | MM2 | WTG1 | WTG6 | WTG13 | Total | Activity evaluation |
|----------------------------------|--------------------|-----|------|-----|-----|------|------|-------|-------|---------------------|
| | Q25 | Q75 | Q98 | | | | | | | |
| <i>Myotis emarginatus</i> | 1 | 3 | 33 | | | 0.5 | 1.0 | | 0,6 | low activity |
| <i>P. kuhlii / nathusii</i> | 17 | 191 | 1182 | 2.8 | 6.1 | 0.8 | 4.2 | 3.7 | 3.7 | low activity |
| <i>Pipistrellus pipistrellus</i> | 24 | 236 | 1400 | 0.4 | 6.1 | 0.2 | 0.2 | 72.2 | 6.9 | low activity |
| <i>Pipistrellus pygmaeus</i> | 10 | 153 | 999 | 0.8 | 0.6 | 0.2 | 0.2 | 0.2 | 0.9 | low activity |
| <i>Rhinolophus ferrumequinum</i> | 1 | 3 | 6 | | | | 0.5 | | 0.2 | low activity |
| <i>Rhinolophus hipposideros</i> | 1 | 5 | 57 | | | 1.0 | | 1.0 | 0.6 | low activity |

In general in a monitoring points, a low-moderate activity is observed for most of the species except for *M. schreibersii* *N. leisleri*, *T. teniotis* and *Myotis* sp that show high activity and *M. myotis* / *blythii* with very high activity.

Table 19: Evaluation of the level of activity (mean bat passes/transect) detected in the study area (Transect 1, Transect 2, Transect 3).

| Species | Reference activity | | | Transect 1 | Transect 2 | Transect 3 | Total | Activity evaluation |
|------------------------------------|--------------------|-----|-----|------------|------------|------------|-------|---------------------|
| | Q25 | Q75 | Q98 | | | | | |
| <i>M. myotis</i> / <i>blythii</i> | 1 | 2 | 3 | 1 | | | 0.3 | low activity |
| <i>Miniopterus schreibersii</i> | 2 | 6 | 26 | 3 | 2 | 2.7 | 2.6 | moderate activity |
| <i>Nyctalus leisleri</i> | 2 | 7 | 18 | 2 | | 1 | 0.7 | low activity |
| <i>Hypsugo savii</i> | 3 | 13 | 23 | | | 3.5 | 1.2 | low activity |
| <i>Eptesicus serotinus</i> | 1 | 7 | 18 | 2 | 2 | | 1.7 | moderate activity |
| <i>Myotis</i> sp. | 1 | 2 | 9 | | | 1 | 0.7 | low activity |
| <i>Plecotus</i> sp. | 1 | 2 | 9 | 1 | | | 0.3 | low activity |
| <i>P. kuhlii</i> / <i>nathusii</i> | 2 | 9 | 33 | | 1.5 | 6.5 | 2.7 | moderate activity |
| <i>Pipistrellus pipistrellus</i> | 35 | 95 | 163 | 1 | 1 | 1 | 1 | low activity |

6.3.2.7.7 Bat Species of Conservation Concern

Although Kosovo is not a member of the EU. its location adjacent to EU member states and the presence of migratory bat species that pass between Kosovo and adjoining states places an onus on responsible developers to adhere to the requirements of the Directives.

All bat species with potential to occur in Kosovo are listed on Annex IV of the EU Habitats Directive and require strict protection. The majority of the species are also listed on Annex II of the Convention on Migratory Species.

Of particular concern for wind farm projects are species that have an unfavourable conservation status (as determined by the IUCN). species that are considered migratory. and those species that typically fly at height. The likelihood of risk to impacts of wind energy is based on the foraging and flight ecology of bats and migratory behaviour.

To assess the relative risk of collision of the species detected in the project LSA, a "Risk Level" (RL) has been calculated considering the following parameters:

- The mean activity level (corrected with detectability coefficients) calculated for all monitoring points (MM1, MM2, WTG1, WTG6 and WTG13) ;
- The activity at height index (Positive minutes at height/night by Roemer et al., 2017)

The Collision susceptibility index (Number of carcasses+1/density index by Roemer et al., 2017). Parameters b) and c) have been taken from Roemer *et al.* (Roemer, C., Disca, T., Coulon, A., & Bas, Y., 2017. Bat flight height monitored from wind masts predicts mortality risk at wind farms. *Biological conservation*, 215), and are based on an extensive analysis of bats mortality at wind farms in France.

The relative “risk level” has been calculated as follows:

$$RL = a * b * c$$

RL values have been divided in four categories corresponding to quartiles of the distribution $RL_{min} - RL_{max}$ as follows:

- $RL > 52$ = very high;
- $RL > 34 < 52$ = high;
- $RL > 13 < 34$ = moderate;
- $RL < 13$ = low.

Given the different level of risk *Pipistrellus kuhlii* and *Pipistrellus nathusii* were separated although currently the acoustic data available concern only the couple.

The level of risk It was calculated using only data of monitoring points (MM1, MM2, WTG1, WTG6 and WTG13) being those most representative of bats activity and for which it is possible to calculate an activity index (bat passes/hour). The level of risk thus calculated can be extended throughout the Selac site affected by the project.

The five months (May, June, July, August and September 2019) of additional surveys on bats showed the presence of a good number of bat species. The activity detected (bat passes), however, is generally low or moderate excluding some species with high activity (*M. schreibersii*, and *Myotis* sp). The behavior of bats detected by bio-acoustic methods highlights for the site both transit activities, foraging and social activities.

The surveys on the anemometric mast detected activity from high flight species (e.g. Genus *Nyctalus*, *T. teniotis*, *V. murinus*).

The species showing the highest RL were *Nyctalus leisleri* and *Pipistrellus pipistrellus*, while *Pipistrellus kuhlii/nathusii* showed a moderate/very high RL.

Table 20: Species confirmed within the study area and risk factors for impact assessment

| Species | Risk assessment parameters | | Mean activity (Bat passes/hour corrected with detectability coefficients for all monitoring points) | Value of RL | Level of Risk |
|---------------------------------|----------------------------|--------------------------------|---|-------------|---------------|
| | Activity at height index | Collision susceptibility index | | | |
| <i>Barbastella barbastellus</i> | 0 | 19 | 0.01 | 0.00 | Low |
| <i>Eptesicus serotinus</i> | 0.36 | 287 | 0,01 | 0.73 | Low |
| <i>Hypsugo savii</i> | 0.11 | 833 | 0,05 | 4.55 | Low |
| <i>Myotis myotis/blythii</i> | 0.01 | 204 | 0,05 | 0.10 | Low |
| <i>Myotis sp</i> | 0.02 | 3 | 0,10 | 0.01 | Low |
| <i>Myotis emarginatus</i> | 0.02 | 3 | 0,01 | 0.00 | Low |
| <i>Miniopterus schreibersii</i> | 0.02 | 125 | 0,13 | 0.33 | Low |
| <i>Nyctalus lasiopterus</i> | 0.02 | 12715 | 0,01 | 1.73 | Low |
| <i>Nyctalus leisleri</i> | 0.7 | 5115 | 0,05 | 166.49 | Very high |
| <i>Nyctalus noctula</i> | 0.14 | 2783 | 0,01 | 2.03 | Low |
| <i>Pipistrellus kuhlii</i> | 1.97 | 411 | 0,03 | 26.88 | Moderate |
| <i>Pipistrellus nathusii</i> | 0.89 | 1991 | 0,03 | 58.83 | Very high |

| Species | Risk assessment parameters | | Mean activity (Bat passes/hour corrected with detectability coefficients for all monitoring points) | Value of RL | Level of Risk |
|----------------------------------|----------------------------|--------------------------------|---|-------------|---------------|
| | Activity at height index | Collision susceptibility index | | | |
| <i>Pipistrellus pipistrellus</i> | 5.86 | 273 | 0,20 | 318.68 | Very high |
| <i>Pipistrellus pygmaeus</i> | 0.33 | 532 | 0,04 | 7.05 | Low |
| <i>Plecotus</i> sp | 0.01 | 14 | 0,003 | 0.00 | Low |
| <i>Rhinolophus euryale</i> | 0 | 8 | 0,01 | 0.00 | Low |
| <i>Rhinolophus ferrumequinum</i> | 0.04 | 19 | 0,004 | 0.00 | Low |
| <i>Rhinolophus hipposideros</i> | 0 | 8 | 0,004 | 0.00 | Low |
| <i>Tadarida teniotis</i> | 0.01 | 815 | 0,02 | 0.18 | Low |
| <i>Vespertilio murinus</i> | 0.01 | 81678 | 0,004 | 1.63 | Low |

6.3.3 Natural and modified habitats

The habitat map of the LSA according to the EUNIS habitat classification system is presented in Figure 48 and Figure 49 and the estimates of the extension of the various habitats are presented in Table 22.

Natural habitats present in the LSA are characterized by different levels of anthropogenic and/or natural disturbance. Assessing habitat naturality or degradation is among the most current issues in conservation biology, as it helps the designation of protected areas, supports management activities and contributes to an efficient monitoring of restoration projects (Erdős et al., 2017).

To consider pre-existing disturbance and represent the average degradation level of a natural habitat type within the LSA, a habitat degradation variable, d , was considered since these habitats are already characterized by different levels of anthropogenic disturbance causing habitat degradation and loss of ecological function.

Disturbance factors under analysis included overgrazing, wood harvesting, off road vehicle circulation, etc. This task was carried out through both desktop analysis, such as literature review, satellite and aerial photo interpretation, and field studies. Based on these analyses, d baseline values were estimated according to the average degradation value observed.

This degradation coefficient varies from 1, representing undisturbed habitat in its natural state, to 0.2, representing very high anthropogenic and/or natural disturbance according to the table below.

Table 21: Natural habitats degradation levels and relative d score

| Degradation level | Value | d score |
|--|-----------|-----------|
| Very high anthropogenic and/or natural disturbance | Very high | 0.2 |
| High anthropogenic and/or natural disturbance | High | 0.4 |
| Medium anthropogenic and/or natural disturbance | Medium | 0.6 |
| Low anthropogenic and/or natural disturbance | Low | 0.8 |
| No anthropogenic and/or natural disturbance | None | 1 |

The habitats of the LSA are dominated by mountain pastures identified as EUNIS habitats “E1.7 - Closed non-Mediterranean dry acid and neutral grassland” (48% of the LSA). Forests, mostly heavily managed as coppice, occupy 45% of the LSA and are dominated by coppice beech forests (29% of the LSA, EUNIS habitat G1.691 coppice). Other shrubland habitats present in the LSA (F3.2) probably deriving from abandoned pastures or cleared forests, occupy less than 2% of the LSA.

Agricultural fields (I1.3), pastures (E1.A) and settlements (J1.2) are concentrated along the OHTL and account about 6% of the entire LSA. The OHTL crosses twice the Sitnică River (C2.3).

Within the Wind Farm area were also identified during field surveys the following wet areas (**Figure 48**):

- 37 natural springs, of which 11 with a perennial water regime, 22 with a temporary water regime and 4 springs with an unknown water regime;
- 2 small wetlands;

- 2 small fountains, of which 1 with a temporary water regime and 1 with unknown regime.

While, along the OHL area were also detected the following wet areas (**Figure 49**):

- 2 natural springs with a perennial water regime and one with unknown regime;
- 3 small fountains, of which 2 with a perennial water regime and one with a temporary water regime;
- 4 well.

Although these sources are too small to be mapped, considering their importance in supporting the wet environments life, their location was represented on the maps.

Table 22: EUNIS habitat types present in the LSA

| EUNIS habitat types | Degradation level (d) | TOTAL LSA | |
|---|-----------------------|-----------|------|
| | | ha | % |
| <u>Natural Habitats</u> | | | |
| C2.3 - Permanent non-tidal, slow, smooth-flowing watercourses | 0.6 | 5.23 | >0.1 |
| E1.7 - Closed non-Mediterranean dry acid and neutral grassland | 0.4 | 4205.57 | 48 |
| E1.A - Open Mediterranean dry acid and neutral grassland | 0.4 | 135.03 | 2 |
| F3.2 - Sub-Mediterranean deciduous thickets and brushes | 0.6 | 149.91 | 2 |
| G1.691 - Southwestern Moesian beech forests | 0.8 | 478.47 | 5 |
| G1.691 - Southwestern Moesian beech forests (coppice) | 0.4 | 2568.90 | 29 |
| G1.762 - Helleno-Moesian <i>Quercus frainetto</i> forests (coppice) | 0.4 | 229.90 | 3 |
| G1.762 - Helleno-Moesian <i>Quercus frainetto</i> forests | 0.8 | 46.58 | >1 |
| G1.763 - Helleno-Moesian <i>Quercus dalechampii</i> forests | 0.8 | 497.03 | 6 |
| G3.1E5 - Balkan Range <i>Picea abies</i> forests | 1 | 70.01 | >1 |
| G3.4C - South-eastern European <i>Pinus sylvestris</i> forests | 1 | 30.60 | >1 |
| Natural habitats sub-total | | 8417.24 | 95 |
| <u>Modified habitats</u> | | | |
| G3.F12 - Native pine plantations | - | 26.21 | >1 |
| I1.3 - Arable land with unmixed crops grown by low intensity agricultural methods | - | 334.19 | 4 |
| J1.2 - Residential buildings of villages and urban peripheries | - | 65.34 | >1 |

| EUNIS habitat types | Degradation level (d) | TOTAL LSA | |
|----------------------------|-----------------------|-----------|-----|
| | | ha | % |
| Modified habitats sub-tota | | 425.75 | 5 |
| Total (ha) | | 8842.99 | 100 |

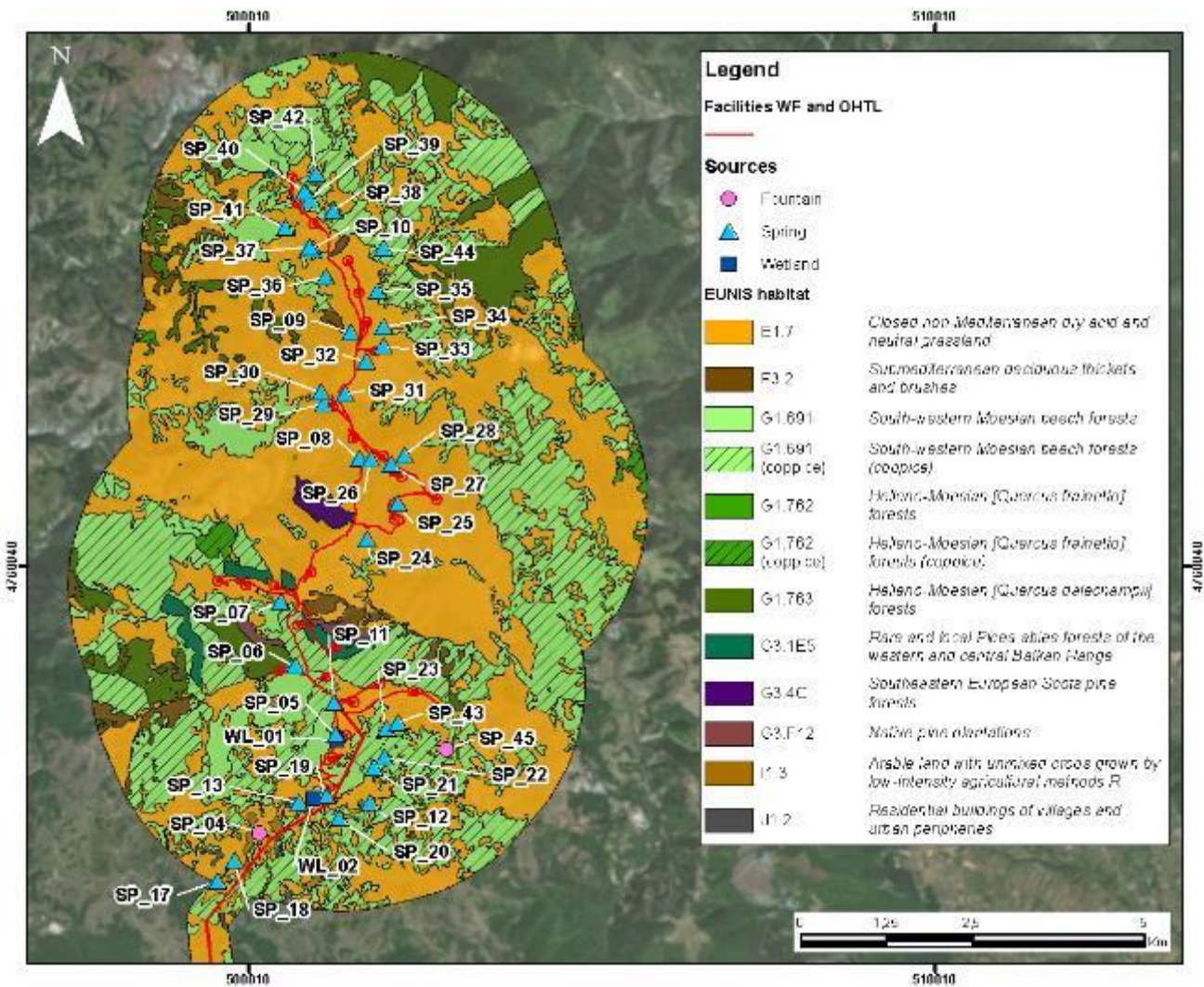


Figure 48: EUNIS habitat map of the Wind Farm LSA

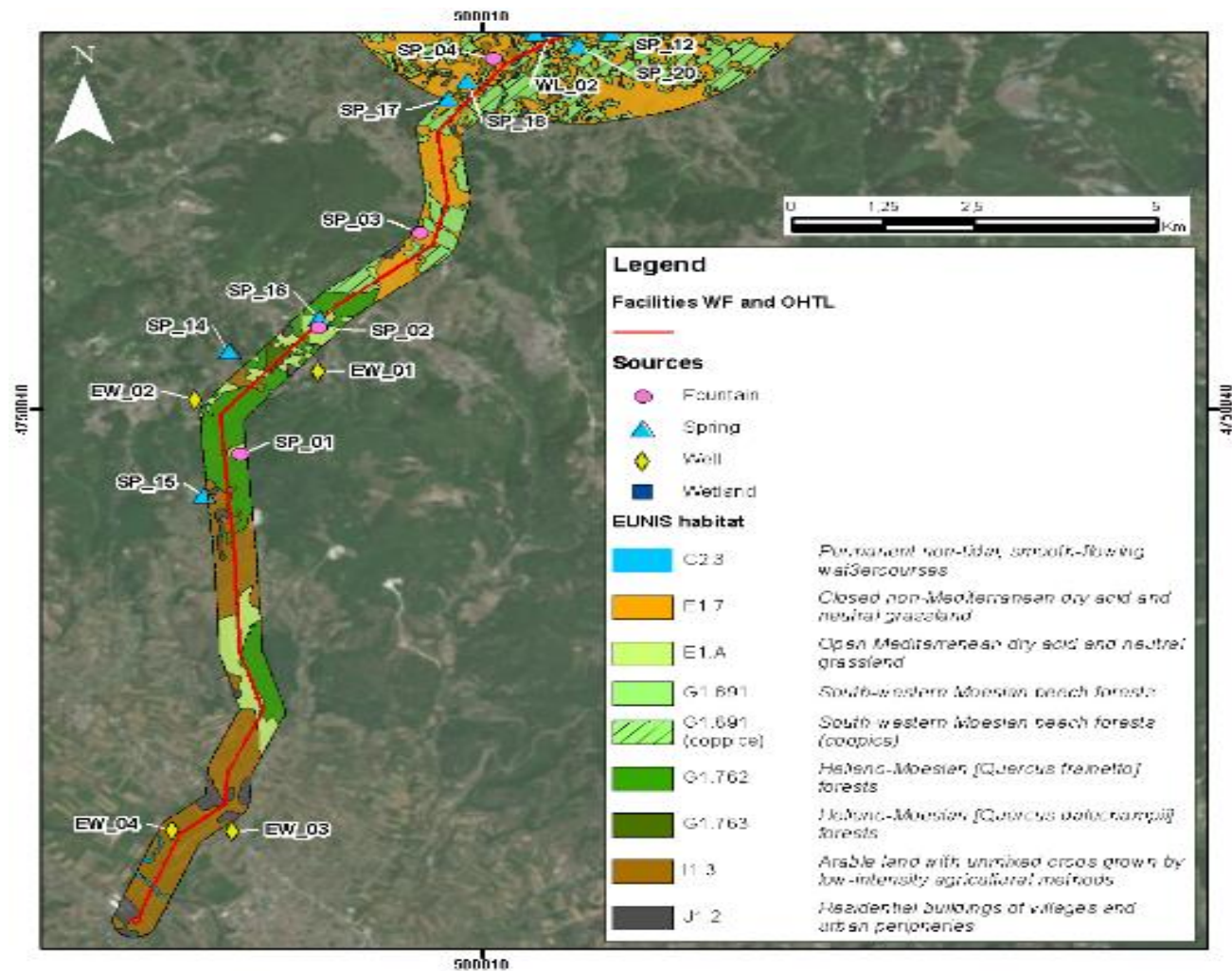


Figure 49: EUNIS habitat map of the OHTL LSA

E1.A - Open Mediterranean dry acid and neutral grassland:

The habitat is located in the highest part of the OHL, represented by "Hilly pastures" (association: *Trifolion cherleri*). It is found along the OHL, AP1-AP10. The habitat is composed, in the Mediterranean region, by open grounds with vernal therophytes, not necessarily grasses. It appears as open perennial grasslands and pastures on siliceous, usually skeletal, soils. In the study area, it is located at an elevation between 1550 and 1045 m. a.s.l. Studies conducted identified the presence of a high degradation due mainly to overgrazing.

The habitat is classified as NT (near threatened) in the "European Red list of Habitats"

E1.7 - Closed non-Mediterranean dry acid and neutral grassland.

It is defined as a closed, dry or mesophile perennial grassland, growing on acid soils. In the study area it is represented in highest part of the OHL (hilly pastures, composed by an association of Mountainous grassland association *Armerion potentillon*). In the study area, it is located at an elevation between 1550 and 1045 m. a.s.l., like E1.A between AP1-AP10.

The habitat is considered Vulnerable (VU) in the "European Red list of Habitats" and hosts EU priority habitat 6230 (Species rich in *Nardus* spp. grassland). However, studies conducted identified the presence of a high degradation in the LSA due mainly to overgrazing and offroad driving.

F3.2 - Sub-Mediterranean deciduous thickets and brush.

The habitat is typically successional and is composed by scrubs. It is found in areas recently cleared of forest vegetation or in abandoned pastures. The degradation level is considered medium.

It hosts mostly deciduous vegetation, of the sub-mediterranean and supra-mediterranean zones, but also colonizes cool, moist or disturbed stations of the mediterranean evergreen forest zone. It includes some non-leafy scrubs, for example *Cytisus purgans* and *Genital aetnensis*.

G1.691 - Southwestern Moesian beech forests (forest)

This habitat is the most widespread in the WF and OHL LSA. It is represented by beech forest (*Fagus moesiaca*) and beech coppice but also by sessile oak (*Quercus petraea*) and European or common hornbeam (*Carpinus betulus*). The degradation level is considered low.

It consists of a medium elevation deciduous forest. The lower elevation is at about 800-1000 m. a.s.l, the upper limit of this forest belt is not very clear due to a very gradual ecotone with the forest from taiga type which creates the next forest belt.

The trees in this type of forests are quite dense resulting in undeveloped bush stories. The grass layer is present only inside forest clearings and along the forest roads. This habitat has very specific climatic conditions; inside the forests (even during summertime) there is enough water in the ground and permanent snow cover from November to March.

EU priority habitat 91W0 Moesian beech forest is included in this EUNIS category.

G1.691 - Southwestern Moesian beech forests (coppice): see above**G1.762 - Helleno-Moesian Quercus frainetto forests (forest)**

The habitat is described as extensive *Quercus frainetto*-dominated forests present in the hills and low mountain slopes of the mountains of north eastern Greece including the Moeso-Macedonian mountains, the Rhodope mountains, the Thessalian mountains. It is a xerothermic habitat, where trees are considerably distanced (open type of forest), and inside the forests the grass layer might be easily developed and distributed. The most

dominant species in the project area is the oak forest represented mainly by Turkey Oak, which is normally in community with Italian oak or plant community of Italian and Turkey Oak (*Quercetum frainetto-cerris*).

It is found at an elevation ranging between 200-300 m a.s.l. and 800-1000 m. In the LSA, it can be found on the OHL, between AP10-AP14. In the WF area the habitat is not much represented, but it hosts important species of flora. The degradation level is considered low.

G1.762 - Helleno-Moesian *Quercus frainetto* forests (coppice): see above

G1.763 - Helleno-Moesian *Quercus dalechampii* forests

The habitat includes, in particular, the xero-mesophile *Quercus dalechampii*-dominated forests, sometimes mixed with *Quercus cerris*, *Quercus frainetto* or *Fraxinus excelsior*, with *Carpinus orientalis*, *Ostrya carpinifolia* or *Fraxinus ornus* often present and sometimes abundant, widespread in the durmast oak-hornbeam, 600-1200 m belt of the Rhodope and the Moeso-Macedonian mountains.

In the study area some of the most valuable species, including *Echium russicum*, the Red-flowered viper's grass (HD II, IV), were found. The habitat is present in the WF area, as well as in the OHL area (AP 10- AP 14). The degradation level is considered low.

G3.1E5 - Balkan Range *Picea abies* forests

The category applies to rare and local forests of the western and central Balkan Range. In the Balkan Peninsula this habitat is represented by isolated patches of some of the mountains inhabiting mainly northern facing slopes or high elevation mountains, above the belt of the Balkan European forests.

The climate is here characterized by long and severe winters, with lots of snow and cold, short moist summers. In the WF Bajgora project area, this biome is represented by Scots pine forests, mixed Scots and spruce and pure Spruce forests. Since information on the degradation of this habitat is not available, using a precautionary approach, no degradation is considered.

G3.4C - South-eastern European *Pinus sylvestris* forests

Pinus sylvestris forests of the eastern Carpathians and of the mountains of the Balkan peninsula, south to northern Greece, formed by the largely isolated, disjunct, south-eastern forms (*Pinus sylvestris* var. *rhodopaea*, var. *illyrica*, *Pinus sylvestris* var. *romanica*) of *Pinus sylvestris* ssp. *sylvestris*, and often limited to azonal edaphic enclaves.

Part of the so called "taiga" biome, the habitat (more precisely G3.4C41: Moeso-Macedonian Scots pine forests) is listed on Annex I of the Bern Convention which means that it is a natural habitat of community interest whose conservation requires the designation of special areas of conservation (Emerald sites).

In the south of its range (in Kosovo and thus in the study area) *Pinus sylvestris* is a high-altitude mountain tree growing at 1,200–2,600 m a.s.l. In the LSA can thus be found in the WF area. Since information on the degradation of this habitat is not available, using a precautionary approach, no degradation is considered.

The species is mainly found on poorer sandy soils, rocky outcrops and close to the forest limit. On fertile sites, Scots pine is out-competed by other species - usually Spruce or broad-leaved tree species.

Inside the pine forests the following species were registered by Biomaster: *Aremonia agrimonoides*, *Astragalus glycyphyllos*, *Brachipodium pinnatum*, *Carlina acanthifolia*, *Crataegus monogina*, *Fagus sylvatica*, *Festuca* sp., *Genista sagitalis*, *Genista tinctoria*, *Geranium sanguineum*, *Poa bulbosa*, *Quercus frainetto*, *Rubus caesius*, *Rubus hirtus*, *Trifolium patulum*.

G3.F12 - Native pine plantations

The category applies to Plantations of Palaearctic conifers of genus *Pinus* within their broad biogeographical area of occurrence, but outside of the conditions described under "reforestation" in the relevant subdivisions of unit G3. Although composed by native trees, the habitat cannot be considered natural. In this case there are plantations of *Pinus nigra* (black pine).

In the study area, black pine forests, mostly planted by the Kosovo forest companies exist, some of them degraded and interdigitating the oak forests present at the edge of the project.

I1.3 - Arable land with unmixed crops grown by low intensity agricultural methods

The EUNIS category is defined as "traditionally and extensively cultivated crops, in particular, of cereals, harbouring a rich and threatened flora of field weeds". This is a very anthropized category of land cover (more than a proper habitat), present at a low altitude in the lowest part of the OHL LSA.

C2.3 - Permanent non-tidal, slow, smooth-flowing watercourses

The category has a wide EUNIS definition, allowing to include both the springs and streams found by Biomaster in the early works WOS in the WF area and the Sitnica river crossing the OHL at a much lower elevation "Permanent water courses with non-turbulent water and their associated animal and microscopic algal pelagic and benthic communities. Slow-flowing rivers, streams, brooks, rivulets and rills; also, fast-flowing rivers with laminar flow. The bed is typically composed of sand or mud. Features of the riverbed, uncovered by low water or permanently emerging, such as sand or mud islands and bars are treated as the littoral zone (C3). Includes mid and low-altitude streams as defined by the Water Framework Directive.

The findings of three springs in the WF area was evaluated of great importance by Biomaster, which evaluated these habitats as able to support a separate flora and fauna composition. Two springs and two wetlands are present within the LSA. One spring and one wetland are located close to I-02 wind turbine. One wetland is located close to I-03 wind turbine. One wetland is located along the access road approximately 600 m south of wind turbine I-01.

The OHL is crossed by the river Sitnica. The river represents a habitat per se, should also be considered for its role of ecological corridor for birds and small wildlife, especially because crossing a highly anthropized farming area (I1.3).

Although included in the same EUNIS category, the freshwater habitats described are very different and located at hundreds of meters of difference in elevation and supporting very different communities with a different hydric regime.

J1.2 - Residential buildings of villages and urban peripheries

Inhabited and heavily modified EUNIS category. It cannot be defined a habitat. It is located at the end of the OHL and represents the target of the energy which will be produced by the Wind farm and carried by the OHL.

6.3.4 Protected areas and internationally recognized areas

No legally protected area is present within the LSA.

However, the LSA partially overlaps with the internationally recognized Kopaonik_Key Biodiversity Area (KBA) and Important Bird Area (IBA) which extend for 73,850 ha (Bird Life International 2019⁷), implying a potential

⁷ BirdLife International (2019) Important Bird Areas factsheet: Kopaonik. Downloaded from <http://www.birdlife.org> on 01/07/2019

trigger of Priority Biodiversity Feature for EBRD PR6 and implying the existence of a Critical Habitat according to IFC PS6.

Kopaonik KBA and IBA also includes the Serbian Kopaonik National Park (Figure 50). The area covers the tallest mountain in central Serbia and it is dominated by coniferous forests and alpine vegetation. The borders of the Park are situated at more than 25 km from the Project.

The trigger species for the definition of this IBA according to the European IBA Criteria B2⁸ are:

- Rock Partridge (*Alectoris graeca*, NT, resident);
- Short-toed Snake-eagle (*Circaetus gallicus*, LC, breeding);
- Rufous-tailed Rock-thrush (*Monticola saxatilis*, LC, breeding).

The general condition score (state) of this IBA has not been assessed, however, the threat score (pressure) assigned is very high. The IBA is therefore classified as “in danger” according to Bird Life (year of assessment 2016).

The main threats impacting this area are considered to be logging and wood harvesting, human intrusions and disturbances due to forestry works but also tourism and recreation, dams and abstraction of surface water for commercial use.

⁸ **European IBA criteria B2.** Species with an unfavourable conservation status in Europe: the site is one of the 'n' most important in the country for a species with an unfavourable conservation status in Europe (SPEC1/2/3) and for which the site-protection approach is thought to be appropriate.

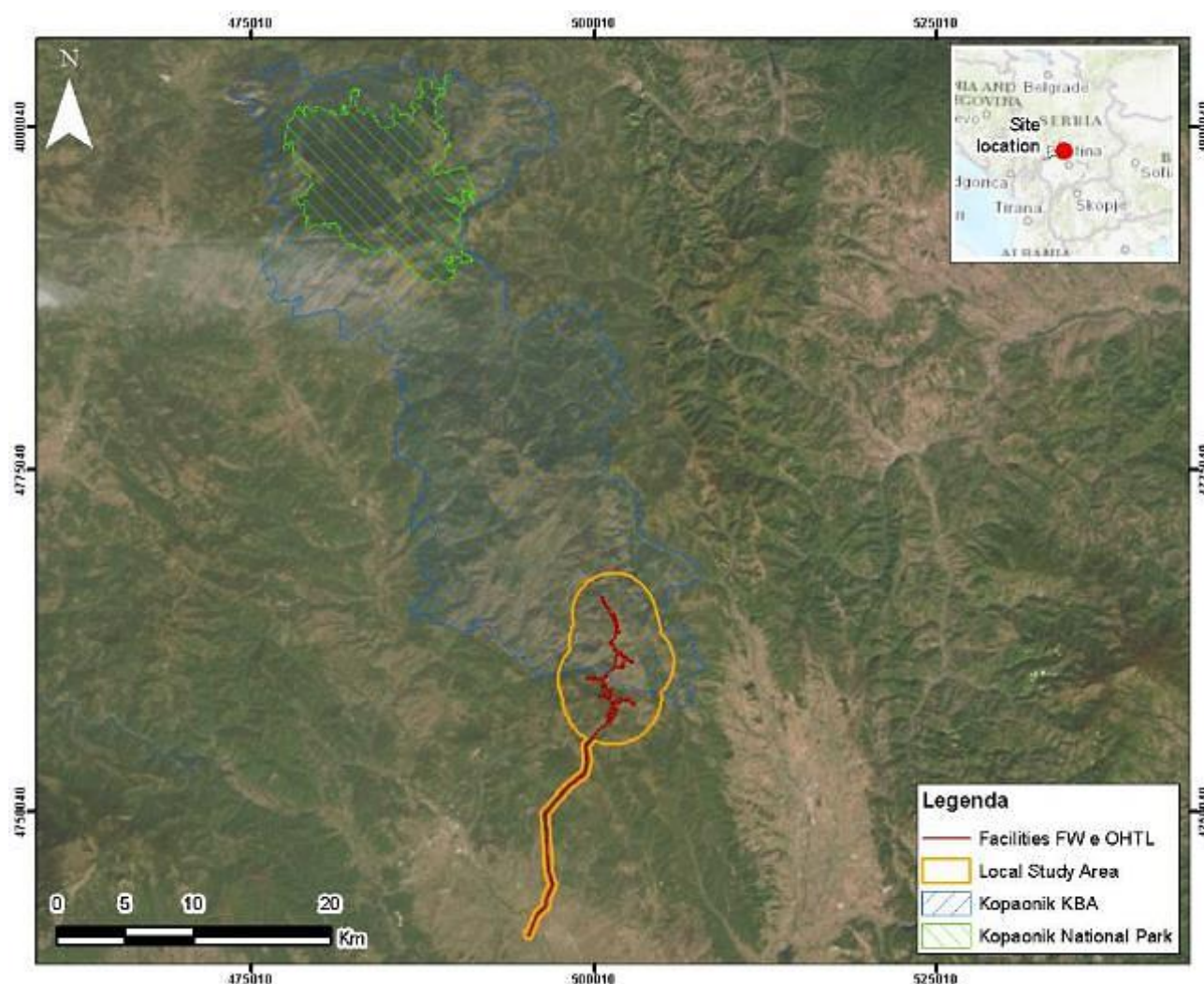


Figure 50: Kopaonik KBA/IBA and Kopaonik National Park

6.1.1 Invasive alien species

Limited information is available on the status of Invasive Alien Species (IAS) in Kosovo. According to the Country Report for Kosovo (ESENIAS Country Report - Overview of the invasive alien species in Kosovo, 2015) prepared by the Eastern and South European Network for Invasive Alien Species (ESENIAS) 11 IAS (6 flora and 5 fish) are present in the Country, a number that is probably a gross underestimation of the real situation, considering that neighbouring Serbia has recorded 346 IAS (ESENIAS Country Report - Overview of the invasive alien species in Serbia, 2015).

According to the mentioned report, the list of IAS in Kosovo is the following:

Plant Species

- *Ambrosia artemisiifolia* L. Asteraceae
- *Datura stramonium* L. Solanaceae
- *Robinia pseudoacacia* L. Fabaceae
- *Amorpha fruticosa* Fabaceae
- *Fallopia japonica* Polygonaceae

- *Helianthus tuberosus* Asteraceae

Fish species

- *Oncorhynchus mykiss* (Walbaum, 1792) Salmonidae
- *Caresses gibelio* (Bloch, 1782) Cyprinidae
- *Pseudorasbora parva* (Temminck & Schlegel, 1842) Cyprinidae
- *Ctenopharyngodon idella* (Valenciennes, 1844) Cyprinidae
- *Lepomis gibbosus* (Linnaeus, 1758) Centrarchidae

Considering the ecological and altitudinal requirements, all flora species could potentially be present in the LSA, particularly in the OHL area. Similarly the fish species are potentially present in the Sitnice river in the area crossed by the OHLn but this is not an issue in the context of the Project.

6.3.5 Priority Biodiversity Features assessment

6.3.5.1 Threatened habitats

Natural and priority habitats identified under the EU Habitats Directive (Annex I) potentially present within the LSA and that trigger this criterion are:

- 6230* Species rich *Nardus* grasslands

The habitat is characterized by closed, dry or mesophile, perennial *Nardus* grasslands occupying siliceous soils in Atlantic or sub-Atlantic or boreal lowland, hill and montane regions of middle and northern Europe and western Iberia. Vegetation highly varied, but the variation is characterized by species-rich sites. In general, the habitats which have become irreversibly degraded through overgrazing are excluded from this definition.

This priority habitat is potentially found in EUNIS habitat “E1.7 - Closed non-Mediterranean dry acid and neutral grassland” situated at higher elevations and in areas with no or limited degradation. However, the pre-construction surveys conducted in 2019 along the and the WF footprint and the OHL identify the presence of medium to high degradation due mainly to overgrazing. This seems to exclude the presence of 6230* priority habitat at least within and in the immediate vicinity of the Project footprint.

- 91W0 Moesian beech forests

This habitat corresponds to EUNIS habitat “G1.691 - South-western Moesian beech forests” that are not heavily modified by coppice forestry practice.

This habitat type is characteristic of the Dinarides, the Moeso-Macedonian mountains, the Pelagonids, the Rhodope, the Thessalian mountains, reaching their southern limits in the Vermion, the Vernon, the border ranges of northern Macedonia, the Chalkidiki, Greek Thrace, the Olympus group, Ossa and Pelion. Within these forests *Fagus sylvatica* is accompanied, at the higher altitudes and latitudes, by *Abies alba* and *Picea abies*. While in the south of their range the forests have a pronounced medio-European character, marked by the frequency of *Acer pseudoplatanus*, *Quercus petraea*, *Fragaria vesca*, *Oxalis acetosella*.

- 9410 Acidophilous *Picea* forests of the montane to alpine levels (*Vaccinio-Piceetea*)

This priority habitat is potentially found in EUNIS habitat “G3.1E5 - Balkan Range *Picea abies* forests”.

This habitat type corresponds to the classification “Pal. 42.25 - Peri-Alpine spruce forests” and it is characterized by spontaneous *Picea abies* formations. It occupies outlying altitudinal or edaphic enclaves within the range of

more predominant vegetation types of the montane levels of the outer Alps, the Carpathians, the Dinarides, the Jura, the Hercynian ranges, the subalpine levels of the Jura, the western Hercynian ranges and the Dinarides.

In addition, EUNIS habitats “E1.7 - Closed non-Mediterranean dry acid and neutral grassland” is also considered Vulnerable (VU) according to the “European Red List of Habitats”.

6.3.5.2 Vulnerable species

All the species listed as having Vulnerable (VU) conservation status according to global IUCN criteria were considered. In absence of a Global IUCN assessment (e.g. Not Evaluated NE, or Data Deficient DD,) local assessments were considered. In addition, fauna and flora species of community interest identified under the EU Habitats Directive (Annex II) were also included.

The list of 24 species identified as triggering PBFs based on this criterion includes:

- 2 flora species;
- 6 invertebrate species;
- 2 amphibians;
- 1 reptile;
- 1 bird;
- 11 bat species; and
- 1 mammal species.

The fish species Wild Common Carp (*Cyprinus carpio*) was not considered as PBF because it is considered an introduced species in Kosovo.

Table 23: List of species triggering the PBF definition

| Taxon | Species | Common name | End./ R.R. | Global IUCN | KRB | Habitat Dir. | Obs. /Litt. | Area |
|-------------|-------------------------------|----------------------------|------------|-------------|-----|--------------|-------------|---------|
| Flora | <i>Echium russicum</i> | Red-flowered viper's grass | | LC | LC | II, IV | O | WF/-OHL |
| Flora | <i>Gentianella bulgarica</i> | Dwarf Bulgarian gentian | | NE | VU | | O | WF/-OHL |
| Coleoptera | <i>Lucanus cervus</i> | Stag beetle | | NT | | II | L | WF/OHL |
| Coleoptera | <i>Rosalia alpina</i> | Rosalia longicorn | | VU | | II, IV | L | WF/OHL |
| Lepidoptera | <i>Coenonympha orientalis</i> | Balkan Heath | | VU | | | O | WF/OHL |
| Lepidoptera | <i>Euphydryas aurinia</i> | Marsh fritillary | | LC | | II | O | WF/OHL |
| Lepidoptera | <i>Lycaena dispar</i> | Large copper | | NT | | II, IV | L | WF/OHL |

| Taxon | Species | Common name | End./ R.R. | Global IUCN | KRB | Habitat Dir. | Obs. /Litt. | Area |
|-------------|----------------------------------|-----------------------------|---------------|----------------|-----|--------------|----------------|------------|
| Lepidoptera | <i>Parnassius apollo</i> | Apollo | | VU | | IV | L | WF/ OHL |
| Amphibians | <i>Bombina variegata</i> | Yellow-bellied toad | | LC | | II, IV | O | WF/ OHL |
| Amphibians | <i>Triturus cristatus</i> | Crested newt | | LC | | II, IV | L | WF |
| Reptiles | <i>Testudo hermanni</i> | Hermann's tortoise | | NT | | II, IV | L | WF/ OHL |
| Birds | <i>Alcedo atthis</i> | Common kingfisher | | VU | | | L | OHL |
| Bats | <i>Barbastella barbastellus</i> | Barbastelle | | NT | | II, IV | O | WF/ OHL |
| Bats | <i>Miniopterus schreibersi</i> | Schreiber's Bent-winged bat | | NT | | II, IV | O | WF/ OHL |
| Bats | <i>Myotis blythi</i> | Lesser Mouse-eared Myotis | | LC | | II, IV | O | WF/ OHL |
| Bats | <i>Myotis capaccini</i> | Long-fingered Bat | | VU | | II, IV | O | WF/ OHL |
| Bats | <i>Myotis emarginatus</i> | Geoffroy's bat | | LC | | II, IV | O | WF/ OHL |
| Bats | <i>Myotis myotis</i> | Greater Mouse-eared bat | | LC | | II, IV | O | WF/ OHL |
| Bats | <i>Nyctalus lasiopterus</i> | Giant Noctule | | VU | | IV | O | WF/ OHL |
| Bats | <i>Rhinolophus ferrumequinum</i> | Greater Horseshoe bat | | LC | | II, IV | O | WF/ OHL |
| Bats | <i>Rhinolophus euryale</i> | Mediterranean Horseshoe Bat | | VU | | II, IV | O | WF/ OHL |
| Bats | <i>Rhinolophus hipposideros</i> | Lesser Horseshoe bat | | LC | | II, IV | O | WF/ OHL |
| Bats | <i>Rhinolophus mehelyi</i> | Mehely's Horseshoe Bat | | VU | | II, IV | O | WF/ OHL |
| Mammals | <i>Canis lupus</i> | Wolf | | LC | | II, IV | L | WF/ OHL |

6.3.5.3 Species included in Annex IV of the Habitat Directive

The Guidance Note to PR6 is indicating that species included in Annex IV of the HD may trigger Critical Habitat. In order to confirm their relevance as CH trigger species, they have been screened according to IFC thresholds and only 5 species have resulted to exceed the thresholds and have been retained as CH trigger species (see Table 24). Considering the need to provide protection according to the HD, all Annex IV species screened out from the CH assessment have been included in the PBF list following a precautionary approach. The species are listed below.

- Butterflies: *Parnassius mnemosyne*, *Phengaris arion*, *Polyommatus eros*
- Amphibians: *Bufo viridis*, *Hyla arborea*, *Rana dalmatina*, *Rana graeca*
- Reptiles: *Ablepharus kitaibeli*, *Coronella austriaca*, *Dolichophis caspius*, *Emys orbicularis*, *Lacerta agilis*, *Lacerta trilineata*, *Lacerta viridis*, *Natrix tessellata*, *Podarcis erhardii*, *Podarcis muralis*, *Telescopus fallax*, *Vipera ammodytes*, *Zamenis longissimus*,
- Birds *Aquila chrysaetos*, *Caprimulgus europaeus*, *Ciconia ciconia*, *Circus aeruginosus*, *Circus cyaneus*, *Circus pygargus*, *Crex crex*, *Dendrocopos medius*, *Dendrocopos syriacus*, *Dryocopus martius*, *Falco peregrinus*, *Gyps fulvus*, *Lanius collurio*, *Lullula arborea*, *Milvus migrans*, *Pernis apivorus*, *Picus canus*, *Upupa epops*.
- Bats: *Eptesicus serotinus*, *Hypsugo savii*, *Myotis daubentonii*, *Myotis mystacinus*, *Nyctalus leisleri*, *Nyctalus noctula*, *Pipistrellus kuhlii*, *Pipistrellus nathusii*, *Pipistrellus pipistrellus*, *Pipistrellus pygmaeus*, *Tadarida teniotis*, *Vespertilio murinus*.
- Mammals: *Dryomys nitedula*, *Felis silvestris*, *Muscardinus avellanarius*.

The habitat preferences and broad ecological requirements of the additional species listed above overlap largely with those of the species already included as PBF in Table 23. The distribution ranges of the species are generally large, extending either throughout Europe or the Mediterranean Region.

6.3.5.4 Significant biodiversity features identified by a broad set of stakeholders or governments

The Kopaonik KBA and IBA located partially within the LSA can be considered a “Significant biodiversity features identified by a broad set of stakeholders” that triggers the definition of PBF for EBRD PR6.

6.3.5.5 Ecological structure and functions needed to maintain the viability of priority biodiversity features described in this paragraph

No peculiar ecological structure and function needed to maintain the viability of priority biodiversity features described in this paragraph was observed with the LSA.

6.3.6 Critical Habitat Assessment

6.3.6.1 Highly threatened or unique ecosystems

No highly threatened or unique ecosystems are present within the LSA.

No EUNIS habitats considered Endangered (EN) or Critically endangered (CR) according the “European Red List of Habitats” were mapped in the LSA.

6.3.6.2 *Habitats of significant importance to endangered or critically endangered species*

The presence of species having Endangered (EN) or Critically Endangered (CR) threat status according to global IUCN criteria was considered. In the absence of a Global IUCN assessment (e.g. Not Evaluated NE, or Data Deficient DD) local assessments were considered (e.g. The Red Book of Vascular Flora of the Republic of Kosovo). In addition, fauna and flora species of community interest identified under the EU Habitats Directive (Annex IV) or under Annex I of the Birds Directive were also included, as well as the triggering species for the IBA.

A screening process was applied for each of the species fitting the above-mentioned categories in order to assess the importance of the LSA for these species, according to IFC thresholds (Guidance Note 6, GN72, IFC 2019):

- a) areas that support globally important concentrations of an IUCN Red-listed EN or CR species (> 0.5% of the global population AND >5 reproductive units of a CR or EN species);
- b) areas that support globally important concentrations of an IUCN Red-listed VU species, the loss of which would result in the change of the IUCN Red List status to EN or CR and meet the thresholds in GN70(a).
- c) as appropriate, areas containing nationally/regionally-important concentrations of an IUCN Red-listed EN or CR species."

The screening process is shown in Table 24.

Table 24: screening of the species of flora and fauna potentially triggering CH according to IFC thresholds (Guidance Note 6, GN72, IFC 2019)

| Taxon | Species | Common name | IUCN global | KRL (flora) | Habitat Directive | Birds Directive | Trigger IBA | Criterion 1a | Criterion 1b | Criterion 1c | CH |
|-------------|-----------------------------|----------------------------|-------------|-------------|-------------------|-----------------|-------------|--------------|--------------|--------------|-----|
| Flora | <i>Daphne blagayana</i> | Blagay's Daphne | NE | EN | | | | | | x | yes |
| Flora | <i>Echium russicum</i> | Red-flowered viper's grass | LC | LC | II, IV | | | | | | |
| Flora | <i>Senecio procerus</i> | Groundsel | NE | EN | | | | | | x | yes |
| Coleoptera | <i>Rosalia alpina</i> | Rosalia longicorn | VU | | II, IV | | | | | | |
| Lepidoptera | <i>Lycaena dispar</i> | Large copper | NT | | II, IV | | | | | | |
| Lepidoptera | <i>Parnassius apollo</i> | Apollo | VU | | IV | | | | | | |
| Lepidoptera | <i>Parnassius mnemosyne</i> | Clouded apollo | NT | | IV | | | | | | |
| Lepidoptera | <i>Phengaris arion</i> | Large blue | NT | | IV | | | | | | |
| Lepidoptera | <i>Polyommatus eros</i> | Eros blue | NT | | IV | | | | | | |
| Amphibians | <i>Bombina variegata</i> | Yellow-bellied toad | LC | | II, IV | | | | | | |
| Amphibians | <i>Bufo viridis</i> | Green toad | LC | | IV | | | | | | |
| Amphibians | <i>Hyla arborea</i> | Tree frog | LC | | IV | | | | | | |
| Amphibians | <i>Rana dalmatina</i> | Agile frog | LC | | IV | | | | | | |
| Amphibians | <i>Rana graeca</i> | Balkan stream frog | LC | | IV | | | | | | |
| Amphibians | <i>Triturus cristatus</i> | Crested newt | LC | | II, IV | | | | | | |
| Reptiles | <i>Ablepharus kitaibeli</i> | Snake eyed skink | LC | | IV | | | | | | |
| Reptiles | <i>Coronella austriaca</i> | Smooth snake | LC | | IV | | | | | | |
| Reptiles | <i>Dolichophis caspius</i> | large whip snake | LC | | IV | | | | | | |
| Reptiles | <i>Emys orbicularis</i> | Pond turtle | NT | | IV | | | | | | |

| Taxon | Species | Common name | IUCN global | KRL (flora) | Habitat Directive | Birds Directive | Trigger IBA | Criterion 1a | Criterion 1b | Criterion 1c | CH |
|----------|------------------------------|----------------------|-------------|-------------|-------------------|-----------------|-------------|--------------|--------------|--------------|-----|
| Reptiles | <i>Lacerta agilis</i> | Sand lizard | LC | | IV | | | | | | |
| Reptiles | <i>Lacerta trilineata</i> | Balkan Green Lizard | LC | | IV | | | | | | |
| Reptiles | <i>Lacerta viridis</i> | Green lizard | LC | | IV | | | | | | |
| Reptiles | <i>Natrix tessellata</i> | Dice snake | LC | | IV | | | | | | |
| Reptiles | <i>Podarcis erhardii</i> | Erhard's Wall Lizard | LC | | IV | | | | | | |
| Reptiles | <i>Podarcis muralis</i> | Common Wall Lizard | LC | | IV | | | | | | |
| Reptiles | <i>Telescopus fallax</i> | Cat snake | LC | | IV | | | | | | |
| Reptiles | <i>Testudo hermanni</i> | Hermann's tortoise | NT | | II, IV | | | | | | |
| Reptiles | <i>Vipera ammodytes</i> | Nose-horned Viper | LC | | IV | | | | | | |
| Reptiles | <i>Zamenis longissimus</i> | Aesculapian snake | LC | | IV | | | | | | |
| Birds | <i>Alcedo atthis</i> | Common kingfisher | VU | | | I | | | | | |
| Birds | <i>Alectoris graeca</i> | Rock partridge | NT | | | I | x | | | x | yes |
| Birds | <i>Aquila chrysaetos</i> | Golden Eagle | LC | | | I | | | | | |
| Birds | <i>Caprimulgus europaeus</i> | Nightjar | LC | | | I | | | | | |
| Birds | <i>Ciconia ciconia</i> | White stork | LC | | | I | | | | | |
| Birds | <i>Circaetus gallicus</i> | Short-toed snake | LC | | | I | x | | | x | yes |
| Birds | <i>Circus aeruginosus</i> | Western marsh | LC | | | I | | | | | |
| Birds | <i>Circus cyaneus</i> | Hen harrier | LC | | | I | | | | | |
| Birds | <i>Circus pygargus</i> | Montagu's Harrier | LC | | | I | | | | | |
| Birds | <i>Crex crex</i> | Corncrake | NT | | | I | | | | | |

| Taxon | Species | Common name | IUCN global | KRL (flora) | Habitat Directive | Birds Directive | Trigger IBA | Criterion 1a | Criterion 1b | Criterion 1c | CH |
|----------------|---------------------------------|-----------------------------|-------------|-------------|-------------------|-----------------|-------------|--------------|--------------|--------------|-----|
| Birds | <i>Dendrocopos medius</i> | Spotted woodpecker | LC | | | I | | | | | |
| Birds | <i>Dendrocopos syriacus</i> | Syrian woodpecker | LC | | | I | | | | | |
| Birds | <i>Dryocopus martius</i> | Black woodpecker | LC | | | I | | | | | |
| Birds | <i>Falco peregrinus</i> | Peregrine falcon | LC | | | I | | | | | |
| Birds | <i>Gyps fulvus</i> | Griffon Vulture | LC | | | I | | | | | |
| Birds | <i>Lanius collurio</i> | Red-backed shrike | LC | | | I | | | | | |
| Birds | <i>Lullula arborea</i> | Woodlark | LC | | | I | | | | | |
| Birds | <i>Monticola saxatilis</i> | Rufous-tailed Rock-thrush | LC | | | | x | | | x | yes |
| Birds | <i>Milvus migrans</i> | Black kite | LC | | | I | | | | | |
| Birds | <i>Pernis apivorus</i> | European Honey-buzzard | LC | | | I | | | | | |
| Birds | <i>Picus canus</i> | Grey-faced woodpecker | LC | | | I | | | | | |
| Birds | <i>Upupa epops</i> | Hoopoe | LC | | | I | | | | | |
| Mammals - bats | <i>Barbastella barbastellus</i> | Western Barbastelle | NT | | II, IV | | | | | | |
| Mammals - bats | <i>Eptesicus serotinus</i> | Serotine bat | LC | | IV | | | | | | |
| Mammals - bats | <i>Hypsugo savii</i> | Savi's Pipistrelle | LC | | IV | | | | | | |
| Mammals - bats | <i>Miniopterus schreibersi</i> | Schreiber's Bent-winged bat | NT | | II, IV | | | | | | |
| Mammals - bats | <i>Myotis blythi</i> | Lesser Mouse-eared Myotis | LC | | II, IV | | | | | | |
| Mammals - bats | <i>Myotis capaccini</i> | Long-fingered Bat | VU | | II, IV | | | | | | |
| Mammals - bats | <i>Myotis daubentonii</i> | Daubenton's Myotis | LC | | IV | | | | | | |
| Mammals - bats | <i>Myotis emarginatus</i> | Geoffroy's bat | LC | | II, IV | | | | | | |

| Taxon | Species | Common name | IUCN global | KRL (flora) | Habitat Directive | Birds Directive | Trigger IBA | Criterion 1a | Criterion 1b | Criterion 1c | CH |
|----------------|----------------------------------|-----------------------------|-------------|-------------|-------------------|-----------------|-------------|--------------|--------------|--------------|----|
| Mammals - bats | <i>Myotis myotis</i> | Greater Mouse - eared bat | LC | | II, IV | | | | | | |
| Mammals - bats | <i>Myotis mystacinus</i> | whiskered myotis | LC | | IV | | | | | | |
| Mammals - bats | <i>Nyctalus lasiopterus</i> | Giant Noctule | VU | | IV | | | | | | |
| Mammals - bats | <i>Nyctalus leisleri</i> | Lesser Noctule | LC | | IV | | | | | | |
| Mammals - bats | <i>Nyctalus noctula</i> | Common Noctule | LC | | IV | | | | | | |
| Mammals - bats | <i>Pipistrellus kuhlii</i> | Kuhl's Pipistrelle | LC | | IV | | | | | | |
| Mammals - bats | <i>Pipistrellus nathusii</i> | Nathusius' Pipistrelle | LC | | IV | | | | | | |
| Mammals - bats | <i>Pipistrellus pipistrellus</i> | Common Pipistrelle | LC | | IV | | | | | | |
| Mammals - bats | <i>Pipistrellus pygmaeus</i> | Soprano Pipistrelle | LC | | IV | | | | | | |
| Mammals - bats | <i>Rhinolophus euryale</i> | Mediterranean Horseshoe Bat | NT | | II, IV | | | | | | |
| Mammals - bats | <i>Rhinolophus ferrumequinum</i> | Greater Horseshoe bat | LC | | II, IV | | | | | | |
| Mammals - bats | <i>Rhinolophus hipposideros</i> | Lesser Horseshoe bat | LC | | II, IV | | | | | | |
| Mammals - bats | <i>Rhinolophus mehelyi</i> | Mehely's Horseshoe Bat | LC | | II, IV | | | | | | |
| Mammals - bats | <i>Tadarida teniotis</i> | European Free-tailed bat | LC | | IV | | | | | | |
| Mammals - bats | <i>Vespertilio murinus</i> | Particoloured bat | LC | | IV | | | | | | |
| Mammals | <i>Canis lupus</i> | Wolf | LC | | II, IV | | | | | | |
| Mammals | <i>Dryomys nitedula</i> | Forest dormouse | LC | | IV | | | | | | |
| Mammals | <i>Felis silvestris</i> | Wild cat | LC | | IV | | | | | | |
| Mammals | <i>Muscardinus avellanarius</i> | Common dormouse | LC | | IV | | | | | | |

As a result of this assessment, 5 species were identified as triggering CH based on this criterion, including:

- 2 flora species (*Daphne blagayana* and *Senecio procerus*);
- 3 bird species (*Alectoris graeca*, *Circaetus gallicus* and *Monticola saxatilis*).

No other species is triggering this criterion once the thresholds are considered, due to the wide distribution of the species and the absence of globally important concentrations of the species within the LSA.

These species were selected according to criterion 1c) (Guidance Note 6, GN70, IFC 2018) “areas containing nationally/regionally-important concentrations of an IUCN Red-listed EN or CR species”, based on a precautionary approach.

- flora species *Daphne blagayana* and *Senecio procerus* are globally not evaluated, however these species are considered nationally important since they are locally listed as EN according to “The red book of vascular flora of the Republic of Kosovo”;
- bird species *Alectoris graeca* and *Circaetus gallicus* are trigger species for the Kopaonik IBA, therefore the area could be considered as containing nationally/regionally-important concentrations of these species included in Annex I of Bird Directive;
- bird species *Monticola saxatilis* is also a trigger species for the Kopaonik IBA, although not included in Annex I of Bird Directive.

Of these species, three were observed in the LSA. The observations were found both in the WF and OHL area.

Table 25: resulting species determining Critical Habitat

| Taxon | Species | Common name | Global IUCN | KRL | Habitat Dir. | Bird Dir. | Obs. /Litt. | Facil |
|-------|----------------------------|---------------------------|-------------|-----|--------------|-----------|-------------|------------|
| Flora | <i>Daphne blagayana</i> | Blagay's Daphne | NE | EN | - | - | O | WF |
| Flora | <i>Senecio procerus</i> | Groundsel | NE | EN | - | - | O | WF |
| Bird | <i>Alectoris graeca</i> | Rock partridge | NT | - | - | I | O | WF/ OHL |
| Bird | <i>Circaetus gallicus</i> | Short-toed snake | LC | - | - | I | O | WF/ OHL |
| Bird | <i>Monticola saxatilis</i> | Rufous-tailed Rock-thrush | LC | | | | O | WF |

6.3.6.3 Habitats of significant importance to endemic or geographically restricted species

No endemic or restricted range species (EOO less than 50,000 km²) is present within the LSA according to the desktop and field studies performed.

6.3.6.4 *Habitats supporting globally significant migratory or congregatory species*

The LSA is not located on a major migratory route or within an area of importance for migratory or congregatory species. The presence of migratory birds observed during field studies was considered quite scarce and no wetland or other potential resting places for migratory birds were identified within the LSA.

For the above reasons, no Critical Habitat is expected to be present in the LSA according to this criterion.

6.3.6.5 *Areas associated with key evolutionary processes*

The LSA is not known to contain landscape feature and/or subpopulations of species with unique evolutionary history. In fact, the LSA is not characterized by a particular level of isolation, spatial heterogeneity, and wealth of environmental gradients or edaphic interfaces. Moreover, the area is not considered to be of demonstrated importance as to climate change adaptation or as biological corridor. These considerations suggest that the LSA does not support any key evolutionary processes.

Therefore, no Critical Habitat is expected to be present in the LSA according to this criterion.

6.3.6.6 *Ecological functions that are vital to maintaining the viability of biodiversity features described in this paragraph*

No particular ecological structure and function needed to maintain the viability of biodiversity features described in this paragraph was observed with the LSA.

6.3.7 *Ecology of species triggering Critical Habitat*

6.3.7.1 *Flora species*

***Daphne blagayana* (Blagay's Daphne)**

Daphne blagayana is a woody perennial plant, classified as fruticose camefite/nano-phanerophyte with buds placed at a height of 0.25-2 m. from the ground. Its flowering period is between March and May.

The plant grows in in pinewoods with black pine, with a "optimum" in the mountain belt. All parts of the plant are extremely poisonous due to the presence of a glucoside (daphnine). *Daphne spp.* have been known since ancient times for their pharmacological qualities, but their use is very dangerous, and often only contact with the epidermis causes redness and blisters on the skin.

Part of the *thymelaceae* family, its range is extended on Albania, Bulgaria, Greece, Slovenia, Croatia, Macedonia, Serbia, Kosovo and Romania (Figure 51). It was found also in Italy (Friuli Venezia Giulia) as a side area of the Slovenia range.

D. blagayana is known to be present within Kopaonik National Park (on high hills) (Rexhepi, F. 1994, 1985; Randjelovic, N. et al. 1979). The presence of the species in Kosovo is also registered in Morinë-locality "Lana e Madhe" on 19.04.2013 (F. Millaku and E. Krasniqi). Lybeten-Vataj (18.03.2011, F. Rexhepi, F. Millaku, E. Krasniqi and Xh. Mala).

The species was observed both in the WF (Figure 52), mainly in the Goldej-Veliki Vrh and Bajrak sector. The EUNIS habitat category potentially hosting the species is thus E1.7. The distribution range of *D. blagayana* detected during October 2018 survey conducted by Biomaster covers an area that goes from above WTG 14 up to and beyond WTG 20, however, not crossing WTG 15, 16, 17 and 18.

It is not evaluated (NE) by IUCN at global level. However, it is listed as CR in the Kosovo red list and due to this it is here considered triggering a critical habitat according to EBRD performance requirements and IFC standards.

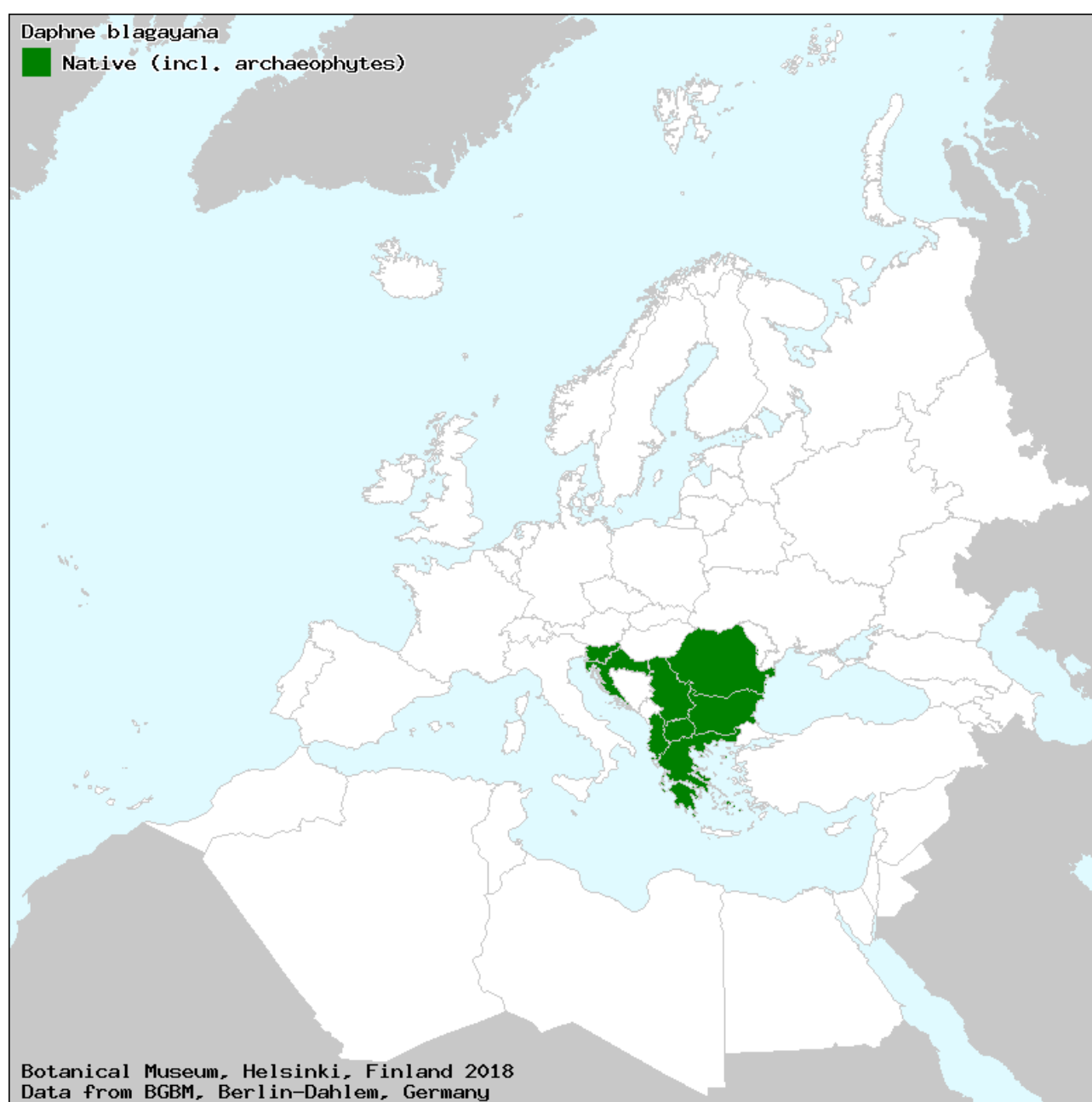


Figure 51: *Daphne blagayana* range distribution (<http://ww2.bgbm.org/EuroPlusMed/>)

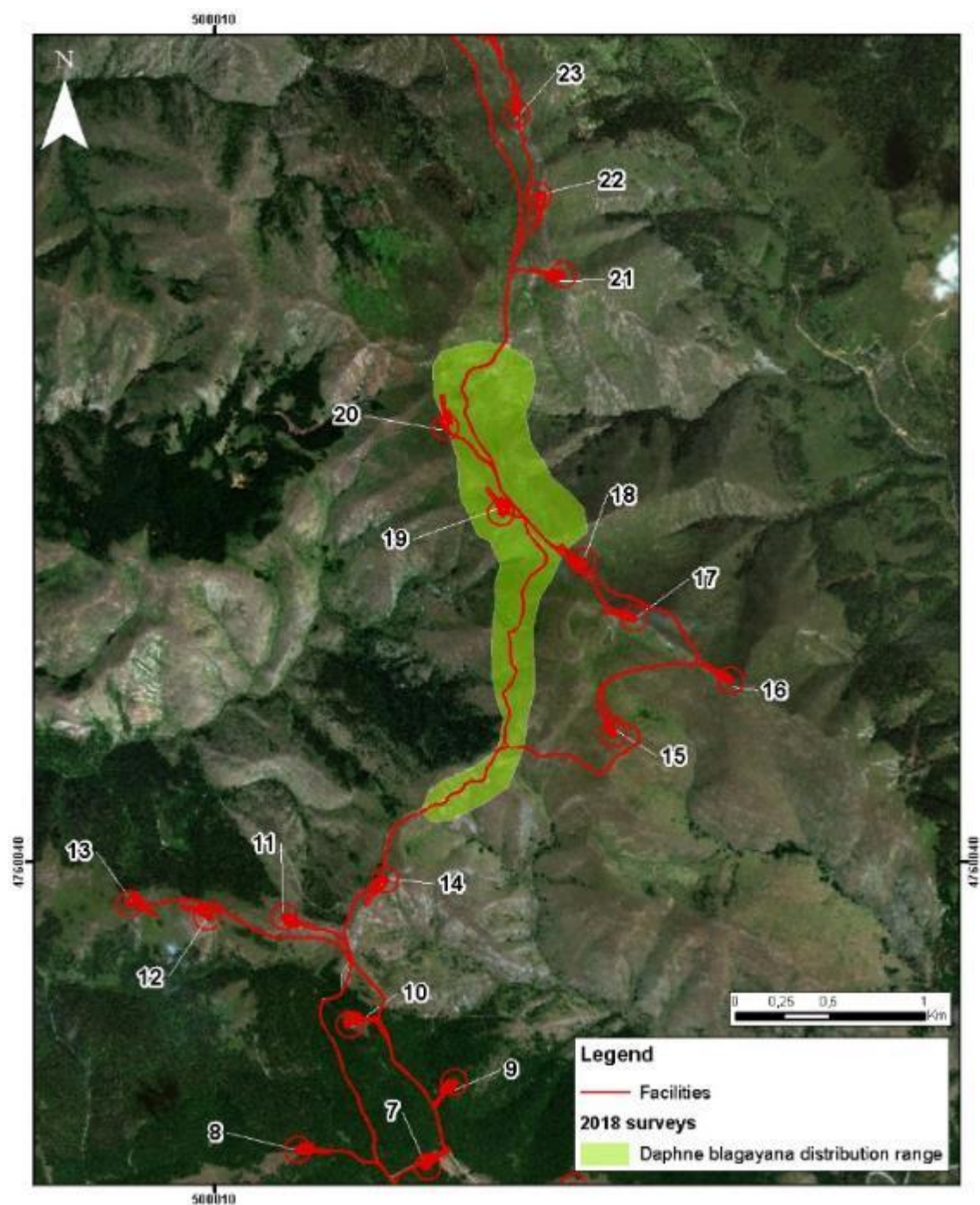


Figure 52: Distribution of *Daphne blagayana* in the WF Selac Project area

***Senecio procerus* (Groundsel)**

S. procerus belongs to the *Asteraceae* family and is native to the Eastern Europe (Figure 53). The plant can be found in the grassland habitat in the subalpine and alpine zone.

In the Balkan Peninsula this species is extant in Kosovo, Albania, Serbia, Bosnia-Herzegovina and Bulgaria. Millaku et al. (2014) defines this species as a Balkan endemism. According to Millaku (1999), Saric et al. (1986)

and Josifovic et al. (1975) the species is distributed in the Sharr Mountains (Bistra, Pashallar) and in the Albanian Alps (Zhleb-Rusoli).

The species was observed inside mountain pastures within both WF area, east of WTG 20 (Figure 54). The EUNIS habitat categories potentially hosting the species are thus E1.7 and E1.A.

Taxonomic synonym of *Tephrosieris papposa*, this species is locally listed as Endangered (EN) according to the Kosovo Red Book, but it is not evaluated (NE) by IUCN.

Threats are, according to the authors, intensive grazing, collection for commercial use and fire. The main risks are thus limited distribution, low density, livestock, fires, habitat loss and degradation.

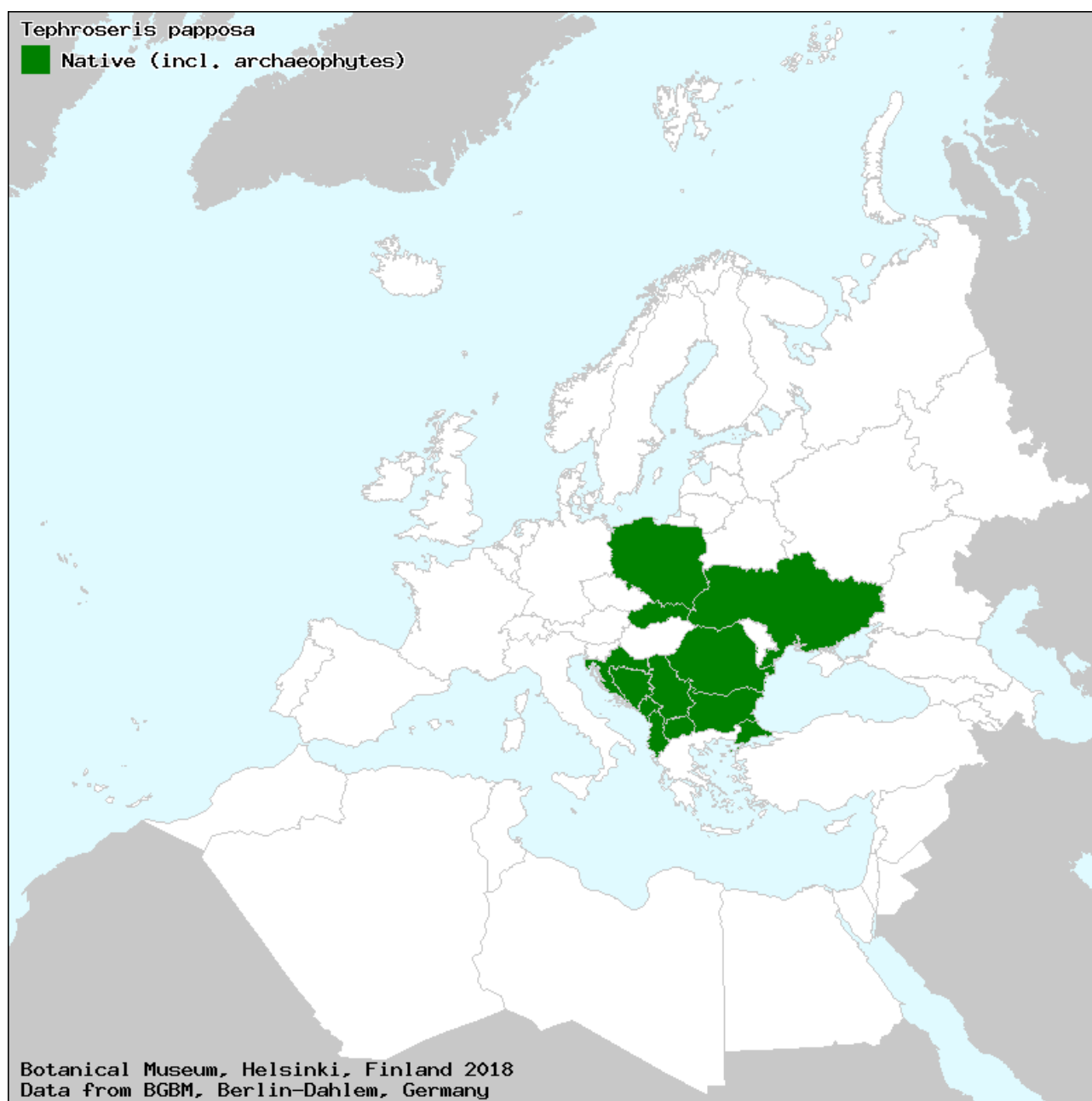


Figure 53: *Senecio procerus* range distribution (<http://ww2.bgbm.org/EuroPlusMed/>)

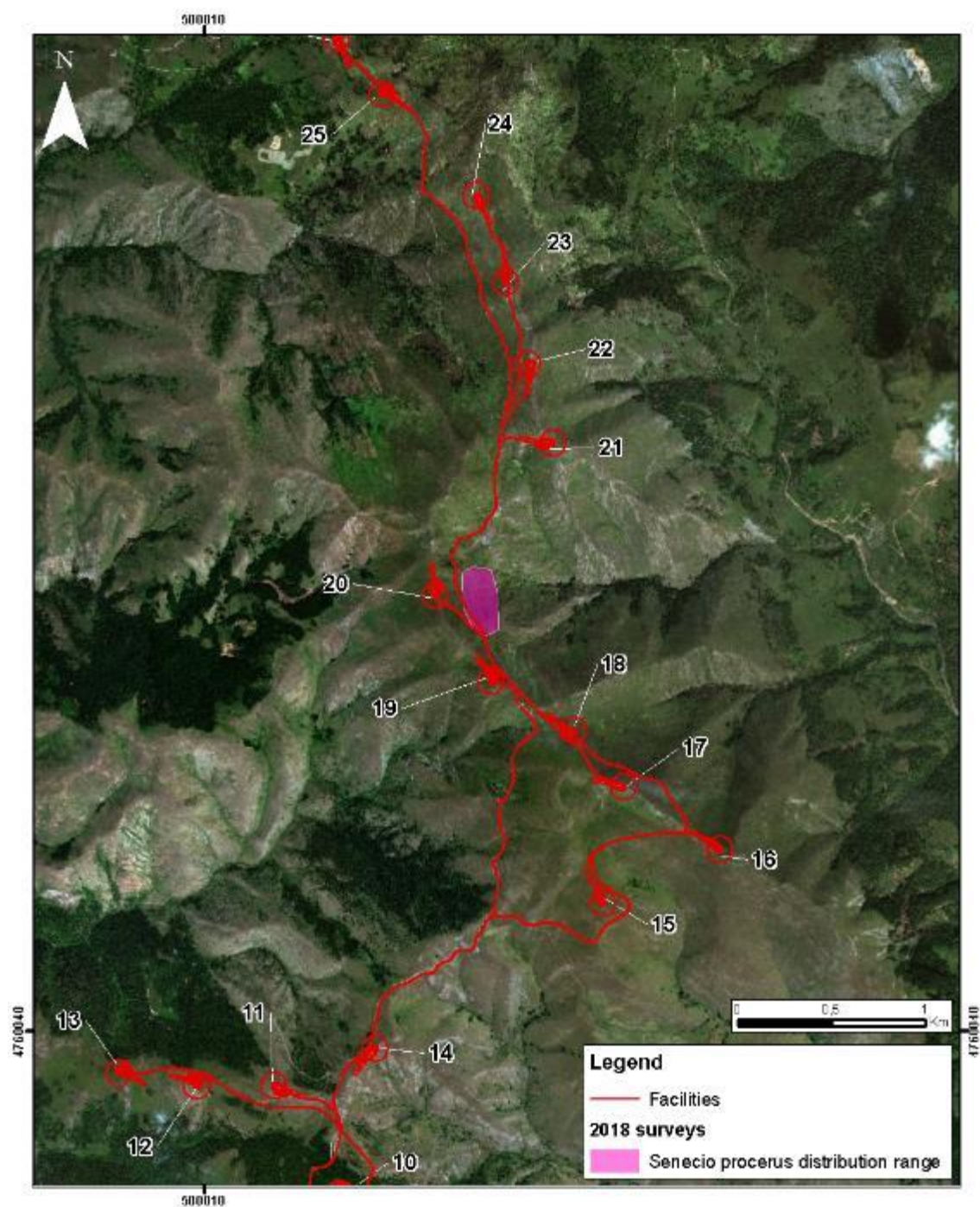


Figure 54: Distribution of *Senecio procerus* in the WF Selac Project area

6.3.7.2 Fauna Species

6.3.7.2.1 Birds

Alectoris graeca (Rock partridge)

Alectoris graeca (IUCN, NT) is listed in Annex I of the European Birds Directive (2009/147/EC).

This species is endemic to Europe, occurring only in the Alps, the Apennines, Sicily and the Balkans (Figure 55). It utilises a varietious habitats and different altitudes, up to 3,000 m in the Alps and almost down to sea level in Sicily and Greece. Generally, *A. graeca* prefer open, mountain habitats with grassy patches, low scrub or scattered conifers (Griffin 2011).

The global population is estimated at about 80,000–150,000 mature individuals (BirdLife International, 2004) with an extent of occurrence (EOO) (breeding/resident) valueted as 1,410,000 km².

The breeding population, which is confined to Europe, is estimated to number 41,800-73,400 pairs, which equates to 83,500-147,000 mature individuals (BirdLife International 2015).

Al. graeca is suspected to be declining moderately rapidly, particularly in the Balkans which hold a substantial proportion of the species's population and range, based on a balanced assessment of the available evidence (e.g. Griffin, 2011, A. Bernard-Laurent *in litt.*, 2012). Within the Balkans, the species breeds in Albania, where a strong decline is suspected since c.1995, in Bosnia-Herzegovina, with about 10,000 pairs even if it is thought to have declined strongly in the last few decades (Sucic, 2008), in Bulgaria, charcaterized by declining numbers and distribution since the 1960s (Iankov, 2007), in Croatia, with about 6,000-10,000 pairs (Tutis *et al.*, in press) wichi are considered to be declining with several local extinctions reported (Budinski *et al.*, 2010]), in Greece, with a apparently stable population in 2005-2011 (Bontzorlos *et al.*, 2011) although the national Red List reports on-going declines and local extirpations in its range (Handrinos and Katsadorakis, 2009), in Macedonia FYR, where are present about 2,000–5,000 pairs (Velevski *et al.*, in press) with no current evidence for a decline, in Montenegro, where the species is declining from 3,000–4,000 pairs (Puzovic *et al.*, 2003) to c.1,300 pairs in 2010-2011 (Saveljic *et al.*, 2011) and in Serbia, with a c. 20-30% decline in the 1990s to c. 1,000–1,500 pairs (Puzovic *et al.*, 2009).

Elsewhere in the species's range, declines have been reported in Albania, common but declining (Z. Dedej and A. Postoli *in litt.* 2012), in Austria (R. Lentner *in litt.* 2012), in Italy with a range reduction in the Apennine Mountains in the last 10-15 years and a decline of 11% in the last 20 years in Sicily (Lo Valvo *et al.* 1993, M. Lo Valvo *in litt.* 2012), and in Switzerland where long-term fluctuations have been followed by recent declines (V. Keller and N. Zbinden *in litt.* 2012). Population monitoring in France from 1981 to 2011 has shown the population to be fluctuating (A. Bernard-Laurent *in litt.*, 2012), while a small population, with an unknown current trend, persists in Slovenia.

Studies in different parts of the species's range (summarised in Griffin, 2011) indicate that *A. graeca* is affected by a wide variety of threats, including habitat loss and degradation (Bernard-Laurent and de Franceschi, 1994) caused by agricultural intensification and urbanization, abandonment of traditional agro-pastoral activities (Budinski *et al.*, 2010; Rippa *et al.*, 2011), reduced connectivity between metapopulations (Cattadori *et al.*, 2003), disturbance, poaching, over-hunting in some areas (del Hoyo *et al.* 1994), extreme climatic events (Bernard-Laurent and Leonard, 2000), hybridisation with released captive-bred *A. chukar* and *A. rufa* (Barilani *et al.*, 2007; Randi, 2008), and the transfer of pathogens and parasites from these species (Manios *et al.*, 2002; Rosà *et al.*, 2011). Additional threats include the increase of tourism in mountain areas, predominantly in the French and Austrian Alps (A. Bernard-Laurent *in litt.*, 2012).

This general declining situation is reflected in the classification of *A. graeca* as Threatened or Near Threatened in various national Red Data Books recently published (covering c. 70% of the species's global population) in which the species has been classified on the basis of population declines thought to approach or exceed 30% over the last three generations.

The species was observed in the LSA, both in the WF and OHL area. The EUNIS habitat category potentially hosting the species are E1.7, F3.2 and G3.1E5.



Figure 55: *Alectoris graeca* range distribution (<http://ww2.bgbm.org/EuroPlusMed/>)

Circaetus gallicus (Short-toed snake)

Circaetus gallicus is classified as Least Concern (LC) according to the IUCN Red List and is protected by the Annex I of the European Birds Directive (2009/147/EC) and the Annex II of the Bern Convention.

This species has an extremely large distribution, of which Europe forms approximately the 34% of the global range (Figure 56). Its extent of occurrence (EOO) (breeding/resident) is about 71,500,000 km².

C. gallicus uses many habitats, up to 2,300 m (del Hoyo et al. 1994), within warm temperate and tropical environments. Although occurring in a variety of habitats, the species always requires some degree of tree cover (del Hoyo et al. 1994). It specialises in feeding on reptiles, particularly snakes (del Hoyo et al. 1994).

C. gallicus individuals breeding in the Palearctic are migratory, with the population in South-East Asia resident. Most migrants winter in tropical North Africa, with some eastern birds moving to the Indian Subcontinent (del Hoyo et al. 1994, Ferguson-Lees and Christie 2001). Migrants move south between August and November, and north between February and May (Ferguson-Lees and Christie 2001). *C. gallicus* individuals are usually observed singly or in pairs, even on migration, though migrants will sometimes form groups of up to 12 (Snow and Perrins 1998, Ferguson-Lees and Christie 2001). They soar at c.20-100 m above the ground (Brown et al. 1982), while the nest is almost always built relatively low in a tree (del Hoyo et al. 1994).

In absence of evidence for any declines or substantial threats, the current global population trend appears stable with about 100,000-200,000 mature individuals. In Europe, the breeding population is estimated to number 17,600-20,900 breeding pairs, equating to 35,100-41,800 mature individuals (BirdLife International 2015).

C. gallicus suffered a marked decline in northern Europe in the 19th-20th centuries, due to habitat loss and persecution (Snow and Perrins, 1998; Ferguson-Lees and Christie, 2001). It still suffers from shooting on Malta (del Hoyo et al. 1994). Moreover, changes in agriculture and land use have reduced the extent of suitable hunting habitat, while snake populations have been reduced by increased cultivation of monocultures, hedge destruction, use of pesticides and the abandonment of traditional farmland and subsequent afforestation. Habitat fragmentation in Europe has resulted from forest fires and road construction.

Nests destruction and powerlines represent additional threats (Tucker and Heath, 1994), along with the effects of potential wind energy development, to which the species seems to be very vulnerable (Strix 2012).

In its West African range, the species is vulnerable to habitat degradation through wood harvesting and overgrazing as well as exposure to pesticides (Thiollay, 2007).

The species was observed in the LSA, both in the WF and OHL area.



Figure 56: *Circaetus gallicus* range distribution (<http://ww2.bgbm.org/EuroPlusMed/>)

***Monticola saxatilis* (Rufous-tailed Rock-thrush)**

Monticola saxatilis is classified as Least Concern (LC) according to the IUCN Red List and is listed in Appendix II of the Bern Convention.

This species typically uses rocky areas (eg. inland cliffs, mountain peaks), heathland, shrubland and sparsely vegetated land from 1,250 m up to 4,000 m. It feeds principally on insects but also fruit and berries (Collar and Bonan 2015).

M. saxatilis is a nocturnal trans-Saharan migrant (Hagemeijer and Blair 1997): European individuals begin to leave their breeding grounds from August to September, and the entire species, aside from a small number wintering in the southern Arabian Peninsula, overwinters in Africa.

This species has an extremely large distribution, of which Europe forms approximately the 20% of the global range (Figure 57). Its extent of occurrence (EOO) (breeding/resident) is about 23,600,000 km². Thus, a very preliminary estimate of the global population size is 890,000-2,830,000 mature individuals, while in Europe, the breeding population is estimated to number 88,900-283,000 pairs, which equates to 178,000-566,000 mature individuals (BirdLife International 2015).

M. saxatilis breeds on wild rocky mountainsides and high hills with scattered shrubs and sporadic grass cover, rocky heaths, extensive limestone screes, lava flows, eroded canyons, crags, open riverbeds, scrubby river gorges, boulder-strewn alpine meadows, upland farmland with stone walls and buildings, rocky ravines and valleys with stunted trees.

In Europe it breeds from May to June, it breeds April-June in north-west Africa, end April-mid-July in Israel, May-June in Afghanistan and Pakistan, May-early August in Mongolia and May-July in China. It is territorial and the male performs display-flights over its territory. The nest is a neat flat cup of coarse grass, rootlets and moss, lined with moss and fine rootlets, normally placed under a rock overhang or in a horizontal rock crevice, wall or ruin, sometimes under a boulder on steep hillside and occasionally in a tree hole. Nest sites are often used successively, including from year to year.

The population trend appears to be decreasing: european population is estimated to be decreasing by less than 25% in 11.4 years (three generations) (BirdLife International 2015).

European declines may be owing to habitat loss in both summer and winter quarters through afforestation and tourism development, as well as succession following pastoral abandonment.

There are currently no known conservation measures for this species within its European range, however the protection of its mountainous breeding grounds should be ensured by preventing afforestation, regulating tourism and preserving pastoral practices.

The species was observed in the LSA in the WF area.

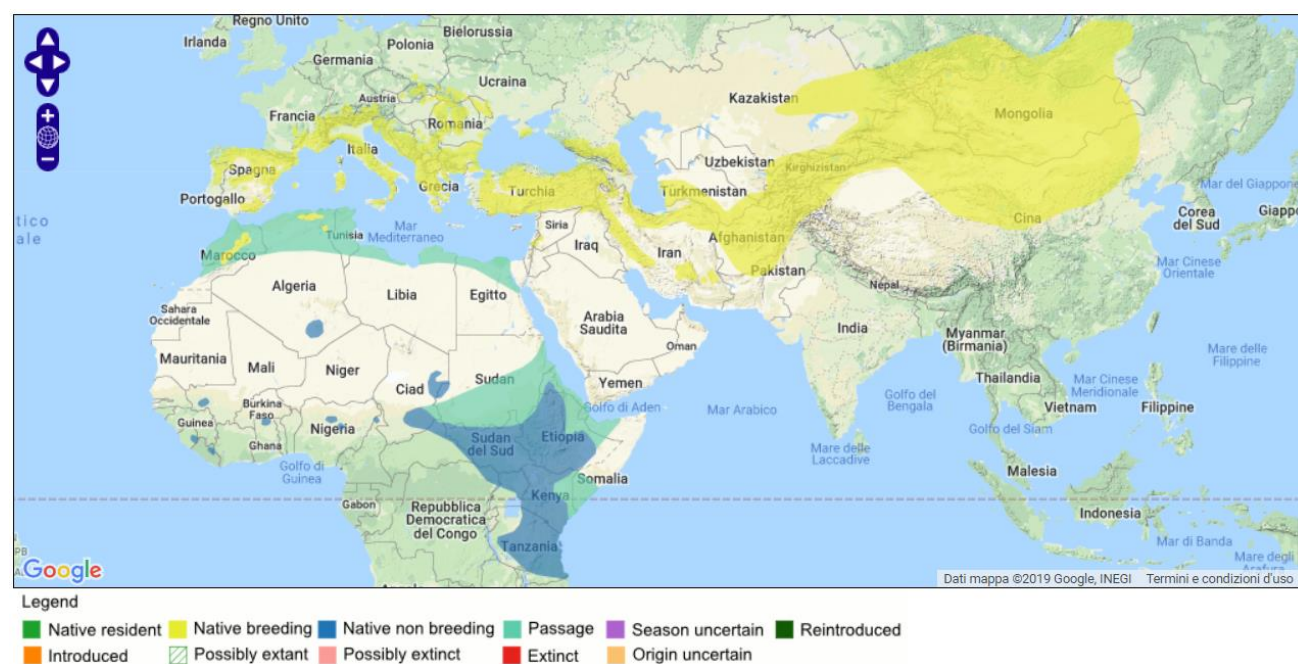


Figure 57: *Monticola saxatilis* range distribution (<http://www.birdlife.org>)

6.4 Conclusions

The species identified during the desktop and field studies include:

- 441 flora species;
- 126 invertebrate species;
- 17 fish species;
- 10 amphibian species;
- 21 reptile species;

- 116 bird species;
- 21 bat species (16 confirmed);
- 27 mammals (other than bats).

The habitats of the LSA are dominated by mountain pastures identified as EUNIS habitats “E1.7 - Closed non-Mediterranean dry acid and neutral grassland” (48% of the LSA). Forests, mostly heavily managed as coppice, occupy 45% of the LSA and are dominated by beech forests (29% of the LSA, EUNIS habitat G1.691). Shrubland habitats present in the LSA (F3.2) probably deriving from abandoned pastures or cleared forests, occupy less than 2% of the LSA. Most natural habitats in the LSA present evident signs of degradation, mainly due to overgrazing, off-road driving and wood cutting. The signs of degradation are more widespread in the areas that will be transformed by the project, which is using existing roads and adjacent areas.

Agricultural fields (I1.3), pastures (E1.A) and settlements (J1.2) are concentrated along the OHL and account 5% of the entire LSA. The OHL is also crossed twice by the Sitnică River (C2.3).

Priority Biodiversity Features (PBFs) identified within the LSA are triggered by:

- 74 species of flora and fauna including 2 flora species, 9 invertebrate species, 6 amphibians, 14 reptile, 18 birds, 23 bats and 4 terrestrial mammals species;
- EU Habitats Directive (Annex I) habitats such as:
 - 6230* Species rich *Nardus* grasslands;
 - 91W0 Moesian beech forests;
 - 9410 Acidophilous *Picea* forests of the montane to alpine levels (*Vaccinio-Piceetea*).
- EUNIS habitats “E1.7 - Closed non-Mediterranean dry acid and neutral grassland” (VU);
- the Kopaonik National Park KBA and IBA.

Critical habitats (CHs) identified within the LSA are mainly concentrated at higher elevations and are triggered by:

- 2 flora species (*Daphne blagayana* and *Senecio procerus*);
- 3 bird species (*Alectoris graeca*, *Circaetus gallicus* and *Monticola saxatilis*).

The general sensitivity of the component is considered to be Medium for the Wind Farm LSA due to the presence of numerous elements of sensitivity that however have limited significance (at national/ regional level).

For the Powerline LSA the general sensitivity is considered to be Medium-low due to the presence of few elements of sensitivity that have limited significance (e.g. majority of modified habitat, limited presence of PBF and no CH).

Priority Biodiversity Features (PBFs) are considered having Medium sensitivity

Critical Habitats (CHs) are considered having a Medium-High sensitivity.

APPENDIX A

List of flora and fauna species

Flora species seen or potentially present in the LSA

| Species | Global IUCN | KRB | Habitat Dir. | End./ R.R. | Obs. /Litt. | CITES | OHL | WF |
|----------------------------------|-------------|-----|--------------|------------|-------------|-------|-----|----|
| <i>Acer campestre</i> | LC | | | | O | | X | |
| <i>Acer heldreichii</i> | LC | | | | O | | | X |
| <i>Acer monspessulanus</i> | NE | | | | L | | | X |
| <i>Acer platanoides</i> | NE | | | | L | | X | X |
| <i>Acer pseudoplatanus</i> | NE | | | | L | | X | X |
| <i>Acer tataricum</i> | LC | | | | O | | X | |
| <i>Achillea millefolium</i> | NE | | | | O | | X | X |
| <i>Acinos alpinus</i> | NE | | | | O | | X | |
| <i>Actaea spicata</i> | NE | | | | L | | | X |
| <i>Aethionema saxatile</i> | NE | | | | O | | X | |
| <i>Agrimonia agrimonoides</i> | NE | | | | O | | X | |
| <i>Agrostis capillaris</i> | LC | | | | O | | X | X |
| <i>Ajuga genevensis</i> | NE | | | | O | | X | |
| <i>Alchemilla plicatula</i> | NE | | | | O | | X | X |
| <i>Alchemilla subglabra</i> | NE | | | | O | | | X |
| <i>Alliaria petiolata</i> | NE | | | | O | | X | |
| <i>Allium ursinum</i> | NE | | | | O | | | X |
| <i>Allysum sp.</i> | NE | | | | L | | | X |
| <i>Alyssum montanum</i> | NE | | | | O | | X | |
| <i>Amaranthus retroflexus</i> | NE | | | | O | | X | |
| <i>Anacamptis morio</i> | NE | | | | O | II | | X |
| <i>Anemone nemorosa</i> | NE | | | | L | | X | X |
| <i>Anemone ranunculoides</i> | NE | | | | O | | | X |
| <i>Anthemis cotula</i> | NE | | | | O | | X | |
| <i>Anthemis cretica</i> | NE | | | | O | | X | |
| <i>Arctium lappa</i> | NE | | | | O | | X | |
| <i>Aremonia agrimonoides</i> | NE | | | | O | | X | |
| <i>Aristolochia pallida</i> | NE | | | | O | | X | |
| <i>Armeria sp.</i> | NE | | | | L | | | X |
| <i>Artemisia vulgaris</i> | NE | | | | O | | X | |
| <i>Arum maculatum</i> | NE | | | | L | | | X |
| <i>Asarum europaeum</i> | NE | | | | O | | | X |
| <i>Asperula aristata</i> | NE | | | | O | | X | |
| <i>Asperula cynanchica</i> | NE | | | | O | | X | |
| <i>Asperula odorata</i> | NE | | | | O | | X | |
| <i>Asplenium adiantum-nigrum</i> | NE | | | | O | | X | |
| <i>Asplenium ceterach</i> | NE | | | | O | | X | |
| <i>Asplenium septentrionale</i> | LC | | | | O | | | X |
| <i>Asplenium trichomanes</i> | NE | | | | O | | X | X |
| <i>Asplenium trichomanes</i> | NE | | | | L | | | X |
| <i>Astragalus glycyphyllos</i> | NE | | | | L | | | X |
| <i>Astrantia mayor</i> | NE | | | | L | | | X |

| | | | | | | | | |
|--------------------------------|----|--|--|--|---|--|---|---|
| <i>Asyneuma limonifolium</i> | NE | | | | O | | X | |
| <i>Athyrium filix-femina</i> | NE | | | | L | | | X |
| <i>Atropa belladonna</i> | NE | | | | L | | | X |
| <i>Berberis vulgaris</i> | NE | | | | L | | | X |
| <i>Betula pendula</i> | NE | | | | L | | | X |
| <i>Brachypodium pinnatum</i> | NE | | | | O | | | X |
| <i>Brachypodium sylvaticum</i> | NE | | | | O | | X | X |
| <i>Briza media</i> | NE | | | | O | | X | |
| <i>Briza minima</i> | NE | | | | O | | X | |
| <i>Bromus erectus</i> | NE | | | | O | | X | |
| <i>Bromus sp.</i> | NE | | | | O | | | X |
| <i>Bromus sterilis</i> | NE | | | | O | | X | |
| <i>Bupleurum flavicans</i> | NE | | | | O | | X | |
| <i>Calamagrostis sp.</i> | NE | | | | L | | | X |
| <i>Calamintha grandiflora</i> | NE | | | | L | | | X |
| <i>Caltha palustris</i> | LC | | | | O | | | X |
| <i>Calystegia sepium</i> | LC | | | | O | | X | |
| <i>Campanula glomerata</i> | NE | | | | L | | | X |
| <i>Campanula patula</i> | NE | | | | O | | X | |
| <i>Campanula persicifolia</i> | NE | | | | O | | X | |
| <i>Campanula rapunculus</i> | NE | | | | O | | X | |
| <i>Campanula rotundifolia</i> | NE | | | | O | | X | |
| <i>Campanula trachelium</i> | NE | | | | L | | | X |
| <i>Capsella bursa-pastoris</i> | NE | | | | O | | X | |
| <i>Cardamine bulbifera</i> | NE | | | | O | | X | X |
| <i>Cardamine enneaphyllos</i> | NE | | | | O | | | X |
| <i>Carex cuspidata</i> | NE | | | | L | | | X |
| <i>Carex pilosa</i> | NE | | | | O | | X | |
| <i>Carex sp.</i> | NE | | | | O | | X | |
| <i>Carex sylvatica</i> | NE | | | | O | | X | |
| <i>Carlina acanthifolia</i> | NE | | | | O | | | X |
| <i>Carlina acaulis</i> | NE | | | | O | | X | |
| <i>Carlina vulgaris</i> | NE | | | | O | | X | |
| <i>Carpinus betulus</i> | NE | | | | L | | X | X |
| <i>Carpinus orientalis</i> | NE | | | | O | | X | |
| <i>Centaurea jacea</i> | NE | | | | O | | X | |
| <i>Centaurea splendens</i> | NE | | | | O | | X | |
| <i>Centaurea triumphetii</i> | NE | | | | L | | | X |
| <i>Centaurium tenuiflorum</i> | NE | | | | O | | X | |
| <i>Cerastium pumillum</i> | NE | | | | O | | X | |
| <i>Cerasus avium</i> | NE | | | | L | | | X |
| <i>Ceterach officinarum</i> | NE | | | | O | | X | |
| <i>Chamaecytisus hirsutus</i> | NE | | | | O | | X | X |
| <i>Chenopodium album</i> | NE | | | | O | | X | |
| <i>Cichorium intybus</i> | NE | | | | O | | X | |

| | | | | | | | | |
|---------------------------------|----|----|--|--|---|----|---|---|
| <i>Cirsium arvense</i> | NE | | | | O | | X | |
| <i>Cirsium candelabrum</i> | NE | | | | L | | | X |
| <i>Cirsium eriophorum</i> | NE | | | | O | | X | |
| <i>Clinopodium vulgare</i> | NE | | | | O | | X | |
| <i>Coeloglossum viride</i> | LC | | | | L | | | |
| <i>Colchicum autumnale</i> | NE | | | | O | | X | |
| <i>Colutea arborescens</i> | NE | | | | O | | X | |
| <i>Consolida regalis</i> | NE | | | | O | | X | |
| <i>Convallaria majalis</i> | NE | | | | L | | | X |
| <i>Coridalis cava</i> | NE | | | | O | | X | |
| <i>Cornus mas</i> | NE | | | | O | | X | |
| <i>Cornus sanguinea</i> | NE | | | | O | | X | X |
| <i>Coronilla emeroides</i> | NE | | | | L | | | X |
| <i>Coronilla emerus</i> | NE | | | | L | | | X |
| <i>Corydalis cava</i> | NE | | | | O | | X | X |
| <i>Corylus avellana</i> | NE | | | | O | | X | |
| <i>Corylus column</i> | NE | | | | O | | | X |
| <i>Cotinus coggygria</i> | NE | | | | L | | | X |
| <i>Crataegus monogyna</i> | NE | | | | O | | X | |
| <i>Crepis sancta</i> | NE | | | | O | | X | |
| <i>Criophores angustifolium</i> | LC | | | | O | | X | |
| <i>Crocus chrisanthus</i> | NE | | | | O | | X | |
| <i>Crocus veluchensis</i> | NE | | | | L | | | X |
| <i>Crocus vernus</i> | NE | | | | L | | | X |
| <i>Crupina vulgaris</i> | NE | | | | O | | X | |
| <i>Cyclamen hederifolium</i> | NE | | | | O | | X | |
| <i>Cyclamen neapolitanum</i> | NE | | | | L | | | X |
| <i>Cynodon dactylon</i> | NE | | | | O | | X | |
| <i>Cynoglossum officinale</i> | NE | | | | L | | | X |
| <i>Cynosorus cristatus</i> | NE | | | | O | | X | |
| <i>Cytisus hirsutus</i> | LC | | | | O | | X | |
| <i>Cytisus nigricans</i> | NE | | | | L | | | X |
| <i>Cytisus sp.</i> | NE | | | | L | | | X |
| <i>Cytisus tommasini</i> | LC | | | | O | | X | |
| <i>Dactylis glomerata</i> | NE | | | | O | | X | |
| <i>Dactylorhiza cordigera</i> | NE | | | | O | II | | X |
| <i>Dactylorhiza maculata</i> | NE | | | | O | II | | X |
| <i>Dactylorhiza sambucina</i> | NE | | | | L | | | X |
| <i>Dactylorhiza viridis</i> | LC | | | | O | | | |
| <i>Dana cornubiensis</i> | NE | | | | L | | | X |
| <i>Daphne blagayana</i> | NE | EN | | | O | | X | X |
| <i>Daphne mezereum</i> | LC | | | | O | | | X |
| <i>Daucus carota</i> | LC | | | | O | | X | |
| <i>Dentaria bulbifera</i> | NE | | | | L | | | X |
| <i>Dianthus carthusianorum</i> | NE | | | | O | | X | |

| | | | | | | | | |
|--|----|--|--------|--|---|--|---|---|
| <i>Dianthus pinifolius</i> | NE | | | | L | | | X |
| <i>Dianthus sylvestris</i> | NE | | | | L | | | X |
| <i>Dichanthium ischaemum</i> | NE | | | | O | | X | |
| <i>Digitalis ambigua</i> | NE | | | | O | | X | |
| <i>Digitalis laevigata</i> | NE | | | | O | | X | |
| <i>Doronicum austriacum</i> | NE | | | | L | | | X |
| <i>Doronicum columnae</i> | NE | | | | O | | X | X |
| <i>Dorycnium pentaphyllum</i> ssp. <i>germanicum</i> | NE | | | | O | | X | X |
| <i>Dryopteris filix-mas</i> | NE | | | | O | | X | |
| <i>Echinochloa crus-galli</i> | NE | | | | O | | X | |
| <i>Echinocystis lobata</i> | NE | | | | O | | X | |
| <i>Echinops ritro</i> | NE | | | | O | | X | |
| <i>Echium italicum</i> | NE | | | | O | | X | |
| <i>Echium rubrum</i> | NE | | | | O | | X | |
| <i>Echium russicum</i> | LC | | II, IV | | O | | X | X |
| <i>Edraianthus tenuifolius</i> | NE | | | | L | | | X |
| <i>Epilobium hirsutum</i> | NE | | | | O | | X | X |
| <i>Epilobium montanum</i> | NE | | | | L | | | X |
| <i>Epipactis palustris</i> | LC | | | | O | | X | |
| <i>Equisetum arvense</i> | LC | | | | O | | X | |
| <i>Equisetum palustre</i> | NE | | | | O | | X | |
| <i>Erica carnea</i> | NE | | | | L | | | X |
| <i>Erigeron canadensis</i> | NE | | | | O | | X | |
| <i>Eriophorum angustifolium</i> | NE | | | | O | | X | |
| <i>Eryngium campestre</i> | NE | | | | O | | X | |
| <i>Erythronium dens-canis</i> | NE | | | | O | | X | |
| <i>Euonymus europaeus</i> | NE | | | | O | | X | |
| <i>Euphorbia amygdaloides</i> | NE | | | | O | | X | X |
| <i>Euphorbia cyparissias</i> | NE | | | | O | | X | |
| <i>Euphorbia glabriflora</i> | NE | | | | O | | X | |
| <i>Euphrasia officinalis</i> | NE | | | | O | | X | |
| <i>Euphrasia rostkowiana</i> | NE | | | | O | | X | X |
| <i>Euphrasia</i> sp. | NE | | | | L | | | X |
| <i>Evonimus europaea</i> | NE | | | | L | | | X |
| <i>Evonimus latifolia</i> | NE | | | | L | | | X |
| <i>Evonimus verrucosa</i> | NE | | | | L | | | X |
| <i>Fagus moesiaca</i> | NE | | | | L | | | X |
| <i>Fagus sylvatica</i> | LC | | | | O | | X | X |
| <i>Festuca heterophylla</i> | NE | | | | O | | X | X |
| <i>Festuca pratensis</i> | NE | | | | O | | X | |
| <i>Festuca rubra</i> | NE | | | | O | | | X |
| <i>Festuca</i> spp. | NE | | | | O | | X | |
| <i>Filago vulgaris</i> | NE | | | | O | | X | |
| <i>Filipendula hexapetalla</i> | NE | | | | O | | | X |

| | | | | | | | | |
|---------------------------------|----|----|--|------|---|----|---|---|
| <i>Fragaria vesca</i> | NE | | | | O | | X | |
| <i>Fraxinus excelsior</i> | NE | | | | L | | | X |
| <i>Fraxinus ornus</i> | NE | | | | O | | X | X |
| <i>Fritillaria gussichiae</i> | DD | NE | | End. | O | | | |
| <i>Fritillaria montana</i> | DD | | | | L | | | X |
| <i>Gagea lutea</i> | LC | | | | O | | | X |
| <i>Galanthus nivalis</i> | NE | | | | O | | X | |
| <i>Galium odoratum</i> | NE | | | | O | | X | |
| <i>Galium pseudoaristatum</i> | NE | | | | L | | | X |
| <i>Galium verum</i> | NE | | | | O | | X | X |
| <i>Genista radiata</i> | NE | EN | | | O | | | X |
| <i>Genista sagitalis</i> | NE | | | | O | | X | X |
| <i>Genista sp.</i> | NE | | | | O | | | X |
| <i>Genista tinctoria</i> | NE | | | | O | | X | X |
| <i>Gentiana asclepiadacea</i> | NE | | | | O | | X | |
| <i>Gentiana lutea</i> | NE | VU | | | O | | | X |
| <i>Gentiana punctata</i> | NE | | | | O | | X | |
| <i>Gentiana verna</i> | NE | | | | O | | X | X |
| <i>Gentianella bulgarica</i> | NE | VU | | | O | | X | |
| <i>Geranium dissectum</i> | NE | | | | O | | X | |
| <i>Geranium phaeum</i> | NE | | | | L | | | X |
| <i>Geranium robertianum</i> | NE | | | | O | | X | |
| <i>Geranium sanguineum</i> | NE | | | | L | | | X |
| <i>Geranium silvaticum</i> | NE | | | | L | | | X |
| <i>Geum urbanum</i> | NE | | | | O | | X | X |
| <i>Gnaphalium sylvaticum</i> | NE | | | | O | | X | |
| <i>Gymnadenia conopsea</i> | DD | | | | O | II | X | X |
| <i>Hedera helix</i> | NE | | | | O | | X | |
| <i>Helianthemum canum</i> | NE | | | | O | | X | |
| <i>Helianthemum nummularium</i> | NE | | | | O | | X | |
| <i>Helleborus odoratus</i> | NE | | | | O | | X | X |
| <i>Hepatica nobilis</i> | NE | | | | L | | | X |
| <i>Hieracium hoppeanum</i> | NE | | | | O | | X | |
| <i>Hieracium murorum</i> | NE | | | | O | | X | |
| <i>Hieracium pilosella</i> | NE | | | | O | | | X |
| <i>Hippocrepis comosa</i> | NE | | | | O | | X | |
| <i>Holcus lanatus</i> | NE | | | | O | | X | |
| <i>Holosteum umbellatum</i> | NE | | | | O | | X | |
| <i>Hordeum secalinum</i> | NE | | | | O | | X | |
| <i>Humulus lupulus</i> | NE | | | | O | | X | |
| <i>Hypericum perforatum</i> | NE | | | | O | | X | |
| <i>Hypochaeris maculata</i> | NE | | | | L | | | X |
| <i>Inula salicina</i> | NE | | | | O | | X | |
| <i>Iris reichenbachii</i> | NE | | | | O | | X | |
| <i>Isatis tinctoria</i> | NE | | | | O | | X | |

| | | | | | | | | |
|---------------------------------|----|--|--|--|---|--|---|---|
| <i>Isopyrum thalictroides</i> | NE | | | | O | | X | |
| <i>Izopyrum thalictroides</i> | NE | | | | O | | X | |
| <i>Jasione heldreichii</i> | NE | | | | O | | X | X |
| <i>Juncus effusus</i> | NE | | | | O | | X | |
| <i>Juncus sp.</i> | NE | | | | O | | | X |
| <i>Juniperus communis</i> | LC | | | | O | | X | X |
| <i>Juniperus oxycedrus</i> | NE | | | | O | | X | |
| <i>Jurinea sp</i> | NE | | | | L | | | X |
| <i>Knautia arvensis</i> | NE | | | | O | | X | |
| <i>Knautia drymeia</i> | NE | | | | O | | X | |
| <i>Knautia sp.</i> | NE | | | | L | | | X |
| <i>Lactuca serriola</i> | NE | | | | O | | X | |
| <i>Lamium galeobdolum</i> | NE | | | | O | | X | |
| <i>Lamium luteum</i> | NE | | | | L | | | X |
| <i>Lamium maculatum</i> | NE | | | | O | | X | |
| <i>Lathyrus inermis</i> | NE | | | | L | | | X |
| <i>Lathyrus laxiflorus</i> | NE | | | | L | | | X |
| <i>Lathyrus niger</i> | NE | | | | O | | X | |
| <i>Lathyrus pratensis</i> | NE | | | | O | | X | |
| <i>Lathyrus tuberosus</i> | NE | | | | O | | X | |
| <i>Lathyrus venetus</i> | NE | | | | L | | | X |
| <i>Leucanthemum vulgare</i> | NE | | | | O | | X | |
| <i>Ligustrum vulgare</i> | NE | | | | O | | X | |
| <i>Lilium martagon</i> | NE | | | | O | | X | |
| <i>Linaria vulgaris</i> | NE | | | | O | | X | |
| <i>Linum capitatum</i> | NE | | | | O | | X | |
| <i>Lolium perenne</i> | NE | | | | O | | X | |
| <i>Lonicera caprifolium</i> | NE | | | | O | | X | |
| <i>Lonicera etrusca</i> | NE | | | | L | | | X |
| <i>Lonicera xylosteum</i> | NE | | | | O | | X | X |
| <i>Lotus corniculatus</i> | NE | | | | O | | X | |
| <i>Luzula forsteri</i> | NE | | | | L | | | X |
| <i>Luzula luzuloides</i> | NE | | | | O | | X | |
| <i>Luzula sylvatica</i> | NE | | | | O | | X | |
| <i>Lycopodium clavatum</i> | LC | | | | O | | | X |
| <i>Lysimachia punctata</i> | NE | | | | L | | | X |
| <i>Lythrum salicaria</i> | LC | | | | O | | X | |
| <i>Malus sylvestris</i> | NE | | | | O | | X | |
| <i>Matricaria perforata</i> | NE | | | | O | | X | |
| <i>Melampyrum cristatum</i> | NE | | | | O | | X | |
| <i>Melica uniflora</i> | NE | | | | O | | X | |
| <i>Melittis mellissophyllum</i> | NE | | | | L | | | X |
| <i>Mentha longifolia</i> | LC | | | | O | | X | |
| <i>Mercurialis ovata</i> | NE | | | | L | | | X |
| <i>Micelis muralis</i> | NE | | | | L | | | X |

| | | | | | | | | |
|----------------------------------|----|--|--|--|---|----|---|---|
| <i>Muscari neglectum</i> | NE | | | | O | | X | |
| <i>Muscari pulchellum</i> | NE | | | | O | | | X |
| <i>Mycelis muralis</i> | NE | | | | O | | X | X |
| <i>Myosotis sp.</i> | NE | | | | L | | | X |
| <i>Myosotis sylvatica</i> | NE | | | | O | | X | |
| <i>Neotinea tridentata</i> | NE | | | | O | II | X | X |
| <i>Nigella arvensis</i> | NE | | | | O | | X | |
| <i>Nigella damascena</i> | NE | | | | L | | | X |
| <i>Nigritella nigra</i> | LC | | | | O | | | X |
| <i>Nigritella sp.</i> | NE | | | | L | | | X |
| <i>Ochlopoa annua</i> | NE | | | | O | | X | |
| <i>Onobrychus arenaria</i> | NE | | | | O | | X | |
| <i>Ononis spinosa</i> | NE | | | | O | | X | |
| <i>Orchis mascula</i> | NE | | | | O | II | X | X |
| <i>Orchis sambucina</i> | LC | | | | O | | | X |
| <i>Orlaya grandiflora</i> | NE | | | | O | | X | |
| <i>Orobancha sp.</i> | NE | | | | O | | X | |
| <i>Ostrya carpinifolia</i> | LC | | | | O | | X | |
| <i>Osyris alba</i> | NE | | | | L | | | X |
| <i>Oxalis acetosella</i> | NE | | | | L | | | X |
| <i>Paris quadrifolia</i> | LC | | | | L | | | X |
| <i>Pedicularis sp.</i> | NE | | | | O | | X | |
| <i>Phyl colibita</i> | | | | | O | | X | |
| <i>Physospermum cornubiense</i> | NE | | | | L | | | X |
| <i>Picea excelsa</i> | NE | | | | L | | | X |
| <i>Pinus sylvestris</i> | LC | | | | L | | | X |
| <i>Plantago major</i> | NE | | | | O | | X | |
| <i>Plantago media</i> | NE | | | | O | | X | X |
| <i>Plantago sp.</i> | NE | | | | O | | | X |
| <i>Plantago subulata</i> | NE | | | | O | | | X |
| <i>Platanthera bifolia</i> | NE | | | | O | II | | X |
| <i>Poa bulbosa</i> | NE | | | | O | | X | |
| <i>Poa nemoralis</i> | NE | | | | L | | | X |
| <i>Poa pratensis</i> | NE | | | | O | | X | |
| <i>Polipodium vulgare</i> | LC | | | | O | | X | |
| <i>Polygala mayor</i> | NE | | | | O | | X | |
| <i>Polygala vulgaris</i> | NE | | | | O | | X | |
| <i>Polygonatum verticillatum</i> | NE | | | | L | | | X |
| <i>Polygonum aviculare</i> | NE | | | | O | | X | |
| <i>Polygonum persicaria</i> | NE | | | | O | | X | |
| <i>Polypodium vulgare</i> | NE | | | | L | | | X |
| <i>Polystichum aculeatum</i> | NE | | | | L | | | X |
| <i>Polytrichum commune</i> | NE | | | | L | | | X |
| <i>Populus tremula</i> | NE | | | | O | | X | X |
| <i>Potentilla erecta</i> | LC | | | | O | | X | |

| | | | | | | | | |
|---|----|--|--|--|---|--|---|---|
| <i>Potentilla heptaphylla</i> | NE | | | | O | | | X |
| <i>Potentilla heptaphylla</i> ssp. <i>australis</i> . | NE | | | | O | | | X |
| <i>Potentilla mycrantha</i> | NE | | | | L | | | X |
| <i>Potentilla opaca</i> | NE | | | | L | | | X |
| <i>Potentilla pedata</i> | NE | | | | L | | | X |
| <i>Potentilla reptans</i> | NE | | | | O | | X | |
| <i>Primula acaulis</i> | NE | | | | L | | | X |
| <i>Primula veris</i> | LC | | | | O | | | X |
| <i>Primula vulgaris</i> | NE | | | | O | | X | X |
| <i>Prunella laciniata</i> | NE | | | | O | | X | |
| <i>Prunella vulgaris</i> | NE | | | | O | | X | X |
| <i>Prunus avium</i> | LC | | | | O | | X | X |
| <i>Prunus spinosa</i> | LC | | | | O | | X | X |
| <i>Pteridium aquilinum</i> | NE | | | | O | | X | X |
| <i>Pulmonaria officinalis</i> | NE | | | | L | | | X |
| <i>Pulmonaria rubra</i> | NE | | | | O | | | X |
| <i>Pyrus amygdaliformis</i> | NE | | | | L | | | X |
| <i>Quercus cerris</i> | LC | | | | O | | X | |
| <i>Quercus frainetto</i> | NE | | | | O | | X | X |
| <i>Quercus petraea</i> | LC | | | | O | | X | X |
| <i>Quercus pubescens</i> | LC | | | | O | | X | X |
| <i>Quercus robur</i> | NE | | | | L | | | X |
| <i>Ranunculus arvensis</i> | NE | | | | O | | X | |
| <i>Ranunculus ficaria</i> | LC | | | | O | | | X |
| <i>Ranunculus montanus</i> | LC | | | | O | | X | X |
| <i>Ranunculus</i> sp. | NE | | | | O | | | X |
| <i>Rhus coriaria</i> | NE | | | | L | | | X |
| <i>Robinia pseudoacacia</i> | NE | | | | L | | X | |
| <i>Rosa arvensis</i> | NE | | | | L | | | X |
| <i>Rosa canina</i> | LC | | | | O | | X | |
| <i>Rosa pendulina</i> | LC | | | | O | | X | X |
| <i>Rosa pimpinellifolia</i> | NE | | | | O | | X | X |
| <i>Rosa</i> sp. | NE | | | | O | | X | |
| <i>Rubia peregrina</i> | NE | | | | O | | X | |
| <i>Rubus caesius</i> | NE | | | | O | | X | |
| <i>Rubus canescens</i> | NE | | | | O | | X | |
| <i>Rubus hirtus</i> | NE | | | | O | | X | |
| <i>Rubus idaeus</i> | NE | | | | O | | X | |
| <i>Rumex acetosella</i> | NE | | | | O | | X | |
| <i>Rumex crispus</i> | NE | | | | O | | X | X |
| <i>Ruscus hypoglossum</i> | NE | | | | L | | | X |
| <i>Salix alba</i> | LC | | | | O | | X | |
| <i>Salix caprea</i> | NE | | | | O | | X | X |
| <i>Salix nigra</i> | LC | | | | O | | X | |
| <i>Salix purpurea</i> | LC | | | | O | | X | |

| | | | | | | | | |
|--------------------------------|----|----|--|--|---|--|---|---|
| <i>Salix retusa</i> | LC | | | | O | | | X |
| <i>Salvia pratensis</i> | NE | | | | O | | X | |
| <i>Salvia verbenaca</i> | NE | | | | O | | X | |
| <i>Salvia verticillata</i> | NE | | | | O | | X | |
| <i>Sambucus ebulus</i> | LC | | | | O | | X | |
| <i>Sambucus nigra</i> | NE | | | | O | | X | |
| <i>Sanguisorba officinalis</i> | NE | | | | O | | X | |
| <i>Sanicula europaea</i> | NE | | | | L | | | X |
| <i>Saxifraga rotundifolia</i> | NE | | | | L | | | X |
| <i>Scabiosa columbaria</i> | NE | | | | O | | | X |
| <i>Scilla bifolia</i> | LC | | | | O | | | X |
| <i>Scolymus hispanicus</i> | NE | | | | O | | X | |
| <i>Scorsonera rosea</i> | NE | | | | L | | | X |
| <i>Sedum album</i> | NE | | | | O | | X | |
| <i>Senecio procerus</i> | NE | EN | | | O | | X | X |
| <i>Senecio squalidus</i> | NE | | | | O | | X | |
| <i>Sesleria rigida</i> | NE | | | | L | | | X |
| <i>Sesleria sp.</i> | NE | | | | L | | | X |
| <i>Setaria pumilla</i> | NE | | | | O | | X | |
| <i>Setaria viridis</i> | NE | | | | O | | X | |
| <i>Silene armeria</i> | NE | | | | O | | X | |
| <i>Silene italica</i> | NE | | | | L | | | X |
| <i>Silene paradoxa</i> | NE | | | | O | | X | |
| <i>Silene viscaria</i> | NE | | | | O | | X | |
| <i>Silene vulgaris</i> | LC | | | | O | | X | X |
| <i>Sinapis arvensis</i> | NE | | | | O | | X | |
| <i>Solanum dulcamara</i> | NE | | | | O | | X | |
| <i>Solidago virgaurea</i> | NE | | | | L | | | X |
| <i>Sonchus oleraceus</i> | NE | | | | O | | X | |
| <i>Sorbus aria</i> | NE | | | | O | | | X |
| <i>Sorbus aucuparia</i> | NE | | | | L | | | X |
| <i>Sorbus torminalis</i> | NE | | | | O | | X | X |
| <i>Stachys recta</i> | NE | | | | O | | X | |
| <i>Stachys scardica</i> | NE | | | | O | | | X |
| <i>Stachys sylvatica</i> | NE | | | | O | | X | |
| <i>Stellaria graminea</i> | NE | | | | O | | X | |
| <i>Stellaria holostea</i> | NE | | | | O | | X | |
| <i>Stellaria media</i> | NE | | | | L | | | X |
| <i>Stellaria nemorum</i> | NE | | | | O | | X | |
| <i>Stenactis annua</i> | NE | | | | O | | X | |
| <i>Symphytum tuberosum</i> | NE | | | | O | | X | X |
| <i>Tanacetum vulgare</i> | NE | | | | O | | X | |
| <i>Taraxacum officinale</i> | NE | | | | O | | X | |
| <i>Taraxacum sp.</i> | NE | | | | O | | | X |
| <i>Teucrium chamaedrys</i> | NE | | | | O | | X | |

| | | | | | | | | |
|------------------------------|----|--|--|--|---|--|---|---|
| <i>Teucrium montanum</i> | NE | | | | O | | X | |
| <i>Thlaspi praecox</i> | NE | | | | O | | X | |
| <i>Thlaspi sp.</i> | NE | | | | O | | | X |
| <i>Thymus longicaulis</i> | NE | | | | O | | X | |
| <i>Thymus puegioides</i> | NE | | | | O | | X | |
| <i>Thymus sp.</i> | NE | | | | L | | | X |
| <i>Tilia plathyphyllos</i> | NE | | | | L | | | X |
| <i>Tragopogon pterodes</i> | NE | | | | O | | X | |
| <i>Trifolium dubium</i> | NE | | | | O | | X | |
| <i>Trifolium incarnatum</i> | LC | | | | O | | X | |
| <i>Trifolium montanum</i> | NE | | | | O | | X | |
| <i>Trifolium patulum</i> | NE | | | | L | | | X |
| <i>Trifolium pignatii</i> | NE | | | | L | | | X |
| <i>Trifolium pratense</i> | NE | | | | O | | X | |
| <i>Trifolium repens</i> | NE | | | | O | | X | |
| <i>Tunica saxifraga</i> | NE | | | | O | | X | |
| <i>Tusilago farfara</i> | NE | | | | O | | X | X |
| <i>Typha latifolia</i> | LC | | | | O | | X | |
| <i>Ulmus minor</i> | NE | | | | L | | | X |
| <i>Urtica dioica</i> | NE | | | | O | | | X |
| <i>Vaccinium myrtillus</i> | LC | | | | O | | X | |
| <i>Veratrum lobelianum</i> | NE | | | | O | | X | |
| <i>Veratrum nigrum</i> | NE | | | | O | | | X |
| <i>Verbascum austriacum</i> | NE | | | | L | | | X |
| <i>Verbascum longifolium</i> | NE | | | | O | | X | |
| <i>Verbascum nigrum</i> | NE | | | | O | | X | |
| <i>Verbascum speciosum</i> | NE | | | | O | | X | |
| <i>Verbena officinalis</i> | NE | | | | O | | X | X |
| <i>Veronica chamaedrys</i> | NE | | | | O | | X | |
| <i>Veronica officinalis</i> | LC | | | | O | | | X |
| <i>Viburnum lantana</i> | NE | | | | O | | X | |
| <i>Viburnum opulus</i> | NE | | | | L | | | X |
| <i>Vicia cracca</i> | LC | | | | O | | X | |
| <i>Vicia incana</i> | NE | | | | L | | | X |
| <i>Viola aetolica</i> | NE | | | | O | | X | X |
| <i>Viola silvestris</i> | NE | | | | L | | | X |
| <i>Viola sp.</i> | NE | | | | O | | X | X |
| <i>Viola sylvestris</i> | NE | | | | O | | | X |
| <i>Xanthium strumarium</i> | NE | | | | O | | X | |
| <i>Xeranthemum annuum</i> | NE | | | | O | | X | |

Invertebrate species seen or potentially present in the LSA

| Species | English name | Global IUCN | Admin. instr. N. 18/2012 | Habitats Dir. | End. /RR | Obs. /Litt. | CITES | OHL | WF |
|--------------------------------|-------------------------|-------------|--------------------------|---------------|----------|-------------|-------|-----|----|
| Coleoptera | | | | | | | | | |
| <i>Lucanus cervus</i> | Stag beetle | NT | P | II | | L | | X | X |
| <i>Rosalia alpina</i> | Rosalia longicorn | VU | S | II, IV | | L | | X | X |
| Gasteropoda | | | | | | | | | |
| <i>Helix pomatia</i> | Edible snail | LC | | | | O | | X | X |
| Hymenoptera | | | | | | | | | |
| <i>Bombus terrestris</i> | buff-tailed bumblebee | LC | | | | O | | X | X |
| <i>Formica rufa</i> | Red Wood Ant | NT | | | | O | | X | X |
| Lepidoptera | | | | | | | | | |
| <i>Aglais io</i> | Peacock Butterfly | LC | | | | L | | X | X |
| <i>Aglais urticae</i> | Small Tortoiseshell | LC | | | | L | | X | X |
| <i>Aglaia tau</i> (Saturnidae) | Aglaia tau (Saturnidae) | NE | | | | O | | | X |
| <i>Anthocharis cardamines</i> | Orange-tip | LC | | | | L | | X | X |
| <i>Apatura ilia</i> | Lesser Purple Emperor | LC | P | | | L | | X | |
| <i>Apatura iris</i> | Purple emperor | LC | P | | | L | | X | |
| <i>Araschnia levana</i> | Map Butterfly | LC | | | | L | | X | X |
| <i>Argynnis aglaja</i> | Dark Green Fritillary | LC | | | | L | | X | |
| <i>Argynnis niobe</i> | Niobe Fritillary | LC | | | | O | | X | X |
| <i>Argynnis pandora</i> | Cardinal | LC | | | | L | | X | X |

| Species | English name | Global IUCN | Admin. instr. N. 18/2012 | Habitats Dir. | End. /RR | Obs. /Litt. | CITES | OHL | WF |
|-------------------------------------|--------------------------|-------------|--------------------------|---------------|----------|-------------|-------|-----|----|
| <i>Argynnis paphia</i> | Silver-washed Fritillary | LC | | | | O | | X | X |
| <i>Aricia anteros</i> | Blue Argus | LC | | | | O | | X | X |
| <i>Aricia artaxerxes</i> | Northern Brown Argus | LC | | | | L | | X | X |
| <i>Brenthis daphne</i> | Marbled Fritillary | LC | | | | O | | X | |
| <i>Brenthis hecate</i> | Twin-spot Fritillary | LC | | | | L | | X | X |
| <i>Callophrys rubi</i> | Callophrys rubi | LC | | | | L | | X | X |
| <i>Carcharodus alceae</i> | Mallow Skipper | LC | | | | L | | X | X |
| <i>Carcharodus lavatherae</i> | Marbled Skipper | NT | | | | L | | X | X |
| <i>Celastrina argiolus</i> | Holly Blue | LC | | | | L | | X | X |
| <i>Coenonympha arcania</i> | Pearly Heath | LC | | | | O | | X | X |
| <i>Coenonympha glycerion</i> | Chestnut Heath | LC | | | | L | | | X |
| <i>Coenonympha orientalis</i> | Balkan Heath | VU | | | | O | | X | |
| <i>Coenonympha pamphilus</i> | Small Heath | LC | | | | O | | X | X |
| <i>Colias alfacariensis</i> | Berger's Clouded Yellow | LC | | | | L | | X | |
| <i>Colias caucasica (balcanica)</i> | Balkan Clouded Yellow | LC | | | | O | | X | X |
| <i>Colias croceus</i> | Clouded Yellow | LC | | | | O | | | X |
| <i>Cupido minimus</i> | Small Blue | LC | | | | L | | X | X |
| <i>Erebia euryale</i> | Large Ringlet | LC | | | | O | | | X |
| <i>Erebia ligea</i> | Arran Brown | LC | | | | O | | | X |

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|---------------------------------|---------------------------|-------------|--------------------------|---------------|----------|-------------|-------|-----|----|
| <i>Erebia medusa</i> | Woodland Ringlet | LC | S | | | O | | X | X |
| <i>Erebia oeme</i> | Bright-eyed Ringlet | LC | | | | L | | X | X |
| <i>Erebia ottomana</i> | Erebia ottomana | LC | | | | L | | X | X |
| <i>Euphydryas aurinia</i> | Marsh Fritillary | LC | S | II | | O | | X | |
| <i>Glaucopsyche alexis</i> | Green-underside Blue | LC | | | | L | | X | X |
| <i>Gonepteryx rhamni</i> | Brimstone | LC | | | | O | | X | X |
| <i>Iphiclides podalirius</i> | Scarce Swallowtail | LC | | | | L | | X | X |
| <i>Issoria lathonia</i> | Queen of Spain Fritillary | LC | | | | O | | | X |
| <i>Lasiommata maera</i> | Large Wall Brown | LC | | | | O | | X | |
| <i>Lasiommata megera</i> | Wall Brown | LC | | | | L | | X | X |
| <i>Lasiommata petropolitana</i> | Northern Wall Brown | LC | | | | L | | X | |
| <i>Leptidea duponcheli</i> | Eastern Wood White | LC | | | | O | | X | |
| <i>Leptidea sinapis</i> | Wood White | LC | | | | O | | X | |
| <i>Libythea celtis</i> | Nettle-tree Butterfly | LC | | | | L | | X | X |
| <i>Lycaena alciphron</i> | Purple-shot Copper | LC | | | | L | | X | X |
| <i>Lycaena dispar</i> | Large Copper | NT | | II, IV | | L | | X | |
| <i>Lycaena phlaeas</i> | Small Copper | LC | | | | L | | X | X |
| <i>Lycaena tityrus</i> | Sooty Copper | LC | | | | L | | X | X |
| <i>Lycaena virgaurea</i> | Scarce Copper | LC | | | | L | | X | X |

| Species | English name | Global IUCN | Admin. instr. N. 18/2012 | Habitats Dir. | End. /RR | Obs. /Litt. | CITES | OHL | WF |
|------------------------------|---------------------------|-------------|--------------------------|---------------|----------|-------------|-------|-----|----|
| <i>Maniola jurtina</i> | Meadow Brown | LC | | | | O | | X | X |
| <i>Melanargia galathea</i> | Marbled White | LC | | | | O | | X | X |
| <i>Melanargia larissa</i> | Balkan Marbled White | LC | | | | L | | X | X |
| <i>Melitaea athalia</i> | Heath Fritillary | LC | | | | O | | X | |
| <i>Melitaea cinxia</i> | Glanville Fritillary | LC | | | | L | | X | X |
| <i>Melitaea didyma</i> | Spotted Fritillary | LC | | | | L | | X | X |
| <i>Melitaea phoebe</i> | Knapweed Fritillary | LC | | | | L | | X | |
| <i>Melitaea trivia</i> | Lesser Spotted Fritillary | LC | | | | L | | X | X |
| <i>Nymphalis antiopa</i> | Camberwell Beauty | LC | | | | L | | X | X |
| <i>Nymphalis polychloros</i> | Large Tortoiseshell | LC | | | | L | | X | X |
| <i>Ochlodes sylvanus</i> | Large Skipper | LC | | | | O | | X | |
| <i>Papilio machaon</i> | Swallowtail | LC | | | | L | | X | X |
| <i>Pararge aegeria</i> | Speckled Wood | LC | | | | L | | X | X |
| <i>Parnassius apollo</i> | Apollo | VU | S | IV | | L | I | X | X |
| <i>Parnassius mnemosyne</i> | Clouded Apollo | NT | S | IV | | L | | X | X |
| <i>Phengaris arion</i> | Large Blue | NT | | IV | | L | | X | |
| <i>Pieris balcana</i> | Pieris balcana | LC | | | | L | | X | X |
| <i>Pieris brassicae</i> | large White | LC | | | | L | | X | |
| <i>Pieris mannii</i> | Southern small White | LC | | | | L | | | X |

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|-------------------------------|-----------------------------|-------------|--------------------------|---------------|----------|-------------|-------|-----|----|
| <i>Pieris napi</i> | Green-veined White | LC | | | | L | | X | |
| <i>Pieris rapae</i> | Small White | LC | | | | L | | X | X |
| <i>Plebejus argus</i> | Silver-studded Blue | LC | | | | O | | X | X |
| <i>Plebejus idas</i> | Idas Blue | LC | | | | L | | X | X |
| <i>Polygonia c-album</i> | Comma Butterfly | LC | | | | L | | X | X |
| <i>Polyommatus amandus</i> | Amanda's Blue | LC | | | | L | | X | X |
| <i>Polyommatus bellargus</i> | Adonis Blue | LC | | | | L | | X | X |
| <i>Polyommatus dorylas</i> | Turquoise Blue | NT | | | | L | | X | X |
| <i>Polyommatus eros</i> | Eros Blue | NT | | IV | | O | | X | |
| <i>Polyommatus icarus</i> | Common Blue | LC | | | | O | | | X |
| <i>Pontia edusa</i> | Eastern Bath White | LC | | | | L | | X | X |
| <i>Pseudophilotes vicrama</i> | Eastern Baton Blue | NT | P | | | L | | X | X |
| <i>Pyrgus alveus</i> | Large Grizzled Skipper | LC | | | | O | | X | X |
| <i>Pyrgus armoricanus</i> | Oberthür's Grizzled Skipper | LC | | | | L | | X | X |
| <i>Pyrgus malvae</i> | Grizzled Skipper | LC | | | | L | | X | |
| <i>Satyrrium acaciae</i> | Sloe Hairstreak | LC | | | | L | | | |
| <i>Satyrrium w-album</i> | White-letter Hairstreak | LC | | | | O | | | |
| <i>Satyrus ferula</i> | Great Sooty Satyr | LC | | | | L | | | |
| <i>Scolitantides orion</i> | Chequered Blue | LC | P | | | L | | | |

| Species | English name | Global IUCN | Admin. instr. N. 18/2012 | Habitats Dir. | End. /RR | Obs. /Litt. | CITES | OHL | WF |
|-----------------------------------|----------------------------------|-------------|--------------------------|---------------|----------|-------------|-------|-----|----|
| <i>Thymelicus sylvestris</i> | Small Skipper | LC | | | | L | | | |
| <i>Vanessa atalanta</i> | Red Admiral | LC | | | | L | | | |
| <i>Vanessa cardui</i> | Painted Lady | LC | | | | L | | | |
| <i>Zerynthia cerisy</i> | Eastern Festoon | NT | | | | L | | | |
| Odonata | | | | | | | | | |
| <i>Caliaeschna microstigma</i> | Eastern Spectre | LC | | | | L | | X | |
| <i>Cordulia aenea</i> | Downy Emerald | LC | | | | L | | X | |
| <i>Gomphus vulgatissimus</i> | Common Clubtail | LC | | | | L | | X | |
| <i>Onychogomphus forcipatus</i> | Green-eyed Hooktail | LC | | | | L | | X | |
| Orthoptera | | | | | | | | | |
| <i>Aiolopus thalassinus</i> | Slender Green-winged Grasshopper | LC | | | | L | | X | X |
| <i>Caliptamus italicus</i> | Italian locust | LC | | | | L | | X | |
| <i>Chorthippus albomarginatus</i> | Lesser Marsh Grasshopper | LC | | | | L | | X | X |
| <i>Chorthippus biguttulus</i> | Bow-winged Grasshopper | LC | | | | L | | X | X |
| <i>Chorthippus brunneus</i> | Common Field Grasshopper | LC | | | | L | | X | X |
| <i>Chorthippus dorsatus</i> | Steppe Grasshopper | LC | | | | L | | X | X |
| <i>Chorthippus longicornis</i> | Meadow Grasshopper | LC | | | | L | | X | X |
| <i>Chorthippus apricarius</i> | Tatra Grasshopper | LC | | | | L | | X | X |
| <i>Chortipus biguttulus</i> | Bow-winged Grasshopper | LC | | | | L | | X | |

| Species | English name | Global IUCN | Admin. instr. N. 18/2012 | Habitats Dir. | End. /RR | Obs. /Litt. | CITES | OHL | WF |
|--------------------------------|-------------------------------|-------------|--------------------------|---------------|----------|-------------|-------|-----|----|
| <i>Decticus verrucivorus</i> | Common Wart-biter | LC | | | | L | | X | X |
| <i>Ephippiger ephippiger</i> | Eastern Saddle Bush-cricket | LC | | | | L | | X | X |
| <i>Euthystira brachyptera</i> | Small Gold Grasshopper | LC | | | | L | | X | X |
| <i>Gomphocerippus rufus</i> | White-clubbed Grasshopper | LC | | | | L | | X | X |
| <i>Gomphocerus sibiricus</i> | Club-legged Grasshopper | LC | | | | L | | X | X |
| <i>Odontopodisma decipiens</i> | Cheating Mountain Grasshopper | LC | | | | L | | X | X |
| <i>Oeidopoda coerulescens</i> | Blue Band-winged Grasshopper | LC | | | | L | | X | X |
| <i>Omocestes viridulus</i> | Common Green Grasshopper | LC | | | | L | | X | X |
| <i>Omocestus minutus</i> | Minute Grasshopper | LC | | | | L | | X | |
| <i>Plebejus argus</i> | Silver-studded Blue | LC | | | | O | | X | X |
| <i>Pezotetix giornae</i> | Common Maquis Grasshopper | LC | | | | L | | X | X |
| <i>Podisma pedestris</i> | Common Mountain Grasshopper | LC | | | | L | | | X |
| <i>Poecilimon gracilis</i> | Slender Bright Bush-cricket | LC | | | | L | | X | X |
| <i>Poecilimon ornatus</i> | Ornate Bright Bush-cricket | LC | | | | L | | X | X |
| <i>Polyommatus icarus</i> | Common Blue | LC | | | | | | | |
| <i>Polysarcus denticauda</i> | Bull Bush-cricket | LC | | | | L | | X | X |
| <i>Satyrion w-album</i> | White-letter Hairstreak | LC | | | | O | | X | X |
| <i>Stauroderus scalaris</i> | Ladder Grasshopper | LC | | | | L | | X | X |

| Species | English name | Global IUCN | Admin. instr. N. 18/2012 | Habitats Dir. | End. /RR | Obs. /Litt. | CITES | OHL | WF |
|------------------------------------|-----------------------------------|-------------|--------------------------|---------------|----------|-------------|-------|-----|----|
| <i>Stenobothrus lineatus</i> | Stripe-winged Toothed Grasshopper | LC | | | | L | | X | X |
| <i>Stenobothrus nigromaculatus</i> | Black-spotted Toothed Grasshopper | LC | | | | L | | X | X |
| <i>Stenobothrus stigmaticus</i> | Lesser Toothed Grasshopper | LC | | | | L | | X | X |

Fishes seen or potentially present in the LSA

| Species | English Name | Global IUCN | Admin. instr. N. 18/2012 | Habitat Dir. | End/ R.R. | CITES | Obs. /Litt. | WF/OHL |
|---------------------------------------|---------------------|-------------|--------------------------|--------------|-----------|-------|-------------|--------|
| <i>Alburnoides bipunctatus</i> | Riffle Minnow | LC | P | | | | L | OHL |
| <i>Alburnus alburnus</i> | Bleak | LC | | | | | L | OHL |
| <i>Barbatula barbatula</i> | Stone Loach | LC | | | | | L | OHL |
| <i>Barbus balcanicus/meridionalis</i> | Balkan Barbel | LC | S | | | | L | OHL |
| <i>Carassius gibelio</i> | Prussian Carp | LC | | | | | L | OHL |
| <i>Chondrostoma nasus</i> | Undermouth | LC | | | | | L | OHL |
| <i>Cobitis elongatoides</i> | Spiny loach | LC | S | | | | L | OHL |
| <i>Cyprinus carpio</i> | wild common carp | VU | P | | | | L | OHL |
| <i>Gobio obtusirostris</i> | Danube Gudgeon | LC | - | | | | L | OHL |
| <i>Leucaspisus delineatus</i> | Sunbleak | LC | S | | | | L | OHL |
| <i>Perca fluviatilis</i> | European Perch | LC | | | | | L | OHL |
| <i>Phoxinus phoxinus</i> | Common Minnow | LC | | | | | L | OHL |
| <i>Rhodeus amarus</i> | European Bitterling | LC | S | II | | | L | OHL |
| <i>Rutilus rutilus</i> | Roach | LC | | | | | L | OHL |
| <i>Scardinius erythrophthalmus</i> | Rudd | LC | | | | | L | OHL |
| <i>Silurus glanis</i> | European Catfish | LC | P | | | | L | OHL |
| <i>Squalius cephalus</i> | Common Chub | LC | | | | | L | OHL |

Amphibians seen or potentially present in the LSA

| Species | English Name | Global IUCN | Admin. instr. N. 18/2012 | Habitat Dir. | CITES | End/ R.R. | Obs. /Litt. | WF/OHL |
|------------------------------|---------------------|-------------|--------------------------|--------------|-------|-----------|-------------|--------|
| <i>Bombina variegata</i> | Yellow bellied toad | LC | | II, IV | | | O | WF/OHL |
| <i>Bufo bufo</i> | Common toad | LC | | | | | L | WF/OHL |
| <i>Bufo viridis</i> | Green toad | LC | | IV | | | L | WF/OHL |
| <i>Hyla arborea</i> | Tree frog | LC | | IV | | | L | WF/OHL |
| <i>Pelophylax ridibundus</i> | marsh frog | LC | P | | | | L | OHL |
| <i>Pseudepidalea viridis</i> | European green toad | LC | S | IV | | | L | OHL |
| <i>Rana dalmatina</i> | Agile frog | LC | | IV | | | L | WF/OHL |
| <i>Rana graeca</i> | Balkan stream frog | LC | | IV | | | L | WF/OHL |
| <i>Salamandra salamandra</i> | Fire salamander | LC | | | | | O | WF/OHL |
| <i>Triturus cristatus</i> | Crested newt | LC | | II, IV | | | L | WF/OHL |

Reptiles potentially present in the LSA

| Species | English Name | Global IUCN | Admin. instr. N. 18/2012 | Habitat Dir. | CITES | End/ R.R. | Obs. /Litt. | WF/OHL |
|--------------------------------|----------------------|-------------|--------------------------|--------------|-------|-----------|-------------|--------|
| <i>Ablepharus kitaibelli</i> | Snake eyed skink | LC | | IV | | | L | WF/OHL |
| <i>Anguis fragilis</i> | Slow worm | LC | | | | | L | WF/OHL |
| <i>Coluber caspius</i> | Whip snake | LC | | IV | | | L | WF/OHL |
| <i>Coronella austriaca</i> | Smooth snake | LC | | IV | | | L | WF/OHL |
| <i>Dolichophis caspius</i> | Caspian whipsnake | LC | S | IV | | | L | WF/OHL |
| <i>Elaphe longissima</i> | Aesculapian snake | LC | | IV | | | L | WF/OHL |
| <i>Emys orbicularis</i> | pond turtle | NT | S | IV | | | L | OHL |
| <i>Zamenis longissimus</i> | Sand lizard | LC | | IV | | | L | WF/OHL |
| <i>Lacerta trilineata</i> | Balkan green lizard | LC | S | IV | | | L | OHL |
| <i>Lacerta viridis</i> | Green lizard | LC | | IV | | | L | WF/OHL |
| <i>Malpolon monspessulanus</i> | Montpellier snake | | | | | | L | OHL |
| <i>Natrix natrix</i> | Grass snake | LC | | | | | L | WF/OHL |
| <i>Natrix tessellata</i> | Dice snake | LC | | IV | | | L | WF/OHL |
| <i>Podarcis erhardii</i> | Erhard's wall lizard | LC | S | IV | | | L | OHL |
| <i>Podarcis muralis</i> | Common wall lizard | LC | | IV | | | L | OHL |
| <i>Podarcis tauricus</i> | Balkan wall lizard | | S | | | | L | OHL |
| <i>Telescopus falax</i> | Cat snake | LC | | IV | | | L | WF/OHL |
| <i>Testudo hermanni</i> | Hermann's tortoise | NT | | II, IV | II | II | L | WF/OHL |
| <i>Vipera ammodytes</i> | Nose-horned viper | LC | | IV | | | L | OHL |
| <i>Vipera berus</i> | Adder | LC | | | | | L | WF/OHL |
| <i>Zootoca vivipara</i> | Viviparous lizard | LC | | | | | L | WF/OHL |

Birds seen or potentially present or observed in the LSA

| Species | English Name | Admin. instr. N. 18/2012 | Birds directive | Global IUCN | End/ R.R. | Obs. /Litt. | CITES | WF/OHL |
|----------------------------------|--------------------|--------------------------------|--------------------|----------------|--------------|----------------|-------|--------|
| <i>Accipiter gentilis</i> | Northern goshawk | S | | LC | | O | | WF/OHL |
| <i>Accipiter nisus</i> | Sparrowhawk | S | | LC | | O | | WF/OHL |
| <i>Acrocephalus arundinaceus</i> | Great reed warbler | S | | LC | | L | | OHL |
| <i>Acrocephalus palustris</i> | Marsh warbler | S | | LC | | L | | OHL |
| <i>Actitis hypoleucos</i> | Common sand piper | | | LC | | O | | OHL |
| <i>Aegithalos caudatus</i> | Long-tailed tit | S | | LC | | O | | WF/OHL |
| <i>Alauda arvensis</i> | Eurasian skylark | S | II | LC | | O | II | WF/OHL |
| <i>Alcedo atthis</i> | Common kingfisher | S | I | LC | | L | | OHL |
| <i>Alectoris graeca</i> | Rock Partridge | P | II | LC | | O | II | WF/OHL |
| <i>Anas platyrhynchos</i> | Mallard | | II | LC | | O | | OHL |
| <i>Anas querquedula</i> | Garganey | | | LC | | O | | OHL |
| <i>Anthus spinoletta</i> | Water pipit | | | LC | | O | | WF |
| <i>Anthus trivialis</i> | Tree pipit | S | | LC | | O | | WF/OHL |
| <i>Apus apus</i> | Common swift | S | | LC | | O | | WF/OHL |
| <i>Aquila chrysaetos</i> | Golden Eagle | S | I | LC | | O | I | WF |
| <i>Ardea cynerea</i> | Grey heron | P | | LC | | L | | OHL |
| <i>Ardea purpurea</i> | Purple Heron | | | LC | | O | | OHL |
| <i>Athene noctua</i> | Little owl | S | | LC | | L | | WF/OHL |
| <i>Buteo buteo</i> | Buzzard | S | | LC | | O | | WF/OHL |
| <i>Caprimulgus europaeus</i> | Nightjar | S | I | LC | | O | I | WF |

| Species | English Name | Admin. instr. N. 18/2012 | Birds directive | Global IUCN | End/ R.R. | Obs. /Litt. | CITES | WF/OHL |
|----------------------------|------------------------|--------------------------------|--------------------|----------------|--------------|----------------|---------|--------|
| <i>Carduelis carduelis</i> | European goldfinch | S | | LC | | O | | WF/OHL |
| <i>Carduelis chloris</i> | Greenfinch | S | | LC | | O | | WF/OHL |
| <i>Certhya familiaris</i> | Eurasian tree creeper | S | | LC | | O | | WF/OHL |
| <i>Cettia cetti</i> | Cetti's warbler | S | | LC | | L | | OHL |
| <i>Ciconia ciconia</i> | White stork | S | I | LC | | L | | OHL |
| <i>Cinclus cinclus</i> | Dipper | S | | LC | | O | | WF/OHL |
| <i>Circaetus gallicus</i> | short-toed snake eagle | S | I | LC | | O | | WF/OHL |
| <i>Circus aeruginosus</i> | western marsh | S | I | LC | | L | | OHL |
| <i>Circus cyaneus</i> | hen harrier | S | I | LC | | L | | WF/OHL |
| <i>Circus macrorus</i> | Pale harrier | | I | NT | | O | | WF/OHL |
| <i>Circus pygargus</i> | Montagu's Harrier | | I | LC | | O | II | WF |
| <i>Columba livia</i> | Rock pigeon | P | II | LC | | O | II | WF/OHL |
| <i>Columba palumbus</i> | Wood pigeon | P | II | LC | | O | II, III | WF/OHL |
| <i>Corvus corax</i> | Common raven | S | | LC | | O | | WF/OHL |
| <i>Corvus cornix</i> | Hooded crow | P | II | LC | | O | II | WF/OHL |
| <i>Corvus frugilegus</i> | The rook | P | II | LC | | L | | WF/OHL |
| <i>Corvus monedula</i> | Western jackdaw | P | II | LC | | O | II | WF/OHL |
| <i>Coturnix coturnix</i> | Common quail | P | II | LC | | O | II | WF/OHL |
| <i>Crex crex</i> | Corncrake | S | I | NT | | O | I | WF |
| <i>Cuculus canorus</i> | Common cuckoo | P | | LC | | O | | WF/OHL |
| <i>Delichon urbica</i> | common house martin | S | | LC | | O | | WF/OHL |

| Species | English Name | Admin. instr. N. 18/2012 | Birds directive | Global IUCN | End/ R.R. | Obs. /Litt. | CITES | WF/OHL |
|---------------------------------|--------------------------|--------------------------------|--------------------|----------------|--------------|----------------|-------|--------|
| <i>Dendrocopos major</i> | Great spotted woodpecker | S | | LC | | O | | WF/OHL |
| <i>Dendrocopos medius</i> | Spotted woodpecker | S | I | LC | | O | I | WF/OHL |
| <i>Dendrocopos syriacus</i> | Syrian woodpecker | S | I | LC | | O | I | WF/OHL |
| <i>Dryocopus martius</i> | Black woodpecker | S | I | LC | | O | I | WF/OHL |
| <i>Egretta garzetta</i> | Little Egret | | I | LC | | O | | OHL |
| <i>Emberiza calandra</i> | Corn bunting | S | | LC | | O | | WF/OHL |
| <i>Emberiza cia</i> | Rock bunting | S | | LC | | O | | WF/OHL |
| <i>Emberiza citrinella</i> | Yellowhammer | S | | LC | | O | | WF/OHL |
| <i>Emberiza schoeniclus</i> | Common reed | S | | LC | | L | | OHL |
| <i>Eremophila alpestris</i> | Shore lark | S | | LC | | O | | WF/OHL |
| <i>Erithacus rubecula</i> | European robin | S | | LC | | O | | WF/OHL |
| <i>Falco peregrinus</i> | Peregrine falcon | S | I | LC | | O | I | WF/OHL |
| <i>Falco subbuteo</i> | Eurasian Hobby | | | LC | | O | | WF/OHL |
| <i>Falco tinnunculus</i> | Common kestrel | S | | LC | | O | | WF/OHL |
| <i>Ficedula albicollis</i> | Collared Flycatcher | | I | LC | | O | | OHL |
| <i>Ficedula hypoleuca</i> | European pied flycatcher | S | | LC | | O | | WF/OHL |
| <i>Fringilla coelebs</i> | Common chaffinch | P | | LC | | O | | WF/OHL |
| <i>Fringilla montifringilla</i> | Brambling | S | | LC | | O | | WF/OHL |
| <i>Galerida cristata</i> | Crested lark | S | | LC | | L | | WF/OHL |
| <i>Gallinago gallinago</i> | Snipe | S | | LC | | L | | OHL |
| <i>Garrulus glandarius</i> | Jay | P | II | LC | | O | II | WF/OHL |

| Species | English Name | Admin. instr. N. 18/2012 | Birds directive | Global IUCN | End/ R.R. | Obs. /Litt. | CITES | WF/OHL |
|------------------------------|---------------------------|--------------------------------|--------------------|----------------|--------------|----------------|-------|--------|
| <i>Gyps fulvus</i> | Griffon Vulture | S | I | LC | | O | I | WF |
| <i>Hirundo daurica</i> | Red-rumped swallow | S | | LC | | L | | OHL |
| <i>Hirundo rustica</i> | Barn Swallow | | | LC | | O | | OHL |
| <i>Lanius collurio</i> | Red-backed shrike | S | I | LC | | O | I | WF/OHL |
| <i>Linaria cannabina</i> | Linnet | S | | LC | | O | | WF/OHL |
| <i>Loxia curvirostra</i> | Red crossbill | | | LC | | O | | WF |
| <i>Lullula arborea</i> | Woodlark | S | I | LC | | O | I | WF/OHL |
| <i>Luscinia megarhynchos</i> | Nightingale | S | | LC | | O | | WF/OHL |
| <i>Milvus migrans</i> | Black kite | | I | LC | | O | | WF |
| <i>Monticola saxatilis</i> | Common rock thrush | S | | LC | | O | | WF |
| <i>Motacilla cynerea</i> | Grey wagtail | S | | LC | | O | | WF/OHL |
| <i>Muscicapa striata</i> | Spotted flycatcher | S | | LC | | O | | WF/OHL |
| <i>Nycticorax nycticorax</i> | Black-crowned Night-heron | | I | LC | | O | | OHL |
| <i>Oenanthe oenanthe</i> | Northern wheatear | S | | LC | | O | | WF/OHL |
| <i>Otus scops</i> | Scops owl | S | | LC | | O | | WF/OHL |
| <i>Parus ater</i> | Coal tit | S | | LC | | O | | WF/OHL |
| <i>Parus caeruleus</i> | Blue tit | S | | LC | | O | | WF/OHL |
| <i>Parus lugubris</i> | Sombre tit | S | | LC | | O | | WF/OHL |
| <i>Parus major</i> | Great tit | S | | LC | | O | | WF/OHL |
| <i>Parus palustris</i> | Marsh tit | S | | LC | | O | | WF/OHL |
| <i>Passer domesticus</i> | House sparrow | | | LC | | O | | WF/OHL |

| Species | English Name | Admin. instr. N. 18/2012 | Birds directive | Global IUCN | End/ R.R. | Obs. /Litt. | CITES | WF/OHL |
|--------------------------------|---------------------------|--------------------------------|--------------------|----------------|--------------|----------------|-------|--------|
| <i>Passer montanus</i> | Tree sparrow | | | LC | | O | | WF/OHL |
| <i>Perdix perdix</i> | Grey partridge | P | II | LC | | O | II | WF/OHL |
| <i>Pernis apivorus</i> | European Honey-buzzard | | I | LC | | O | | WF |
| <i>Phoenicurus ochruros</i> | Black redstart | S | | LC | | O | | WF/OHL |
| <i>Phoenicurus phoenicurus</i> | Common redstart | S | | LC | | O | | WF/OHL |
| <i>Phylloscopus collybita</i> | Chiffchaff | S | | LC | | O | | WF/OHL |
| <i>Phylloscopus sibilatrix</i> | Wood warbler | S | | LC | | O | | WF/OHL |
| <i>Phylloscopus trochilus</i> | Willow warbler | S | | LC | | O | | WF/OHL |
| <i>Pica pica</i> | Magpie | P | II | LC | | O | II | WF/OHL |
| <i>Picus canus</i> | Grey-faced woodpecker | S | I | LC | | O | I | WF/OHL |
| <i>Picus viridis</i> | Green woodpecker | S | | LC | | O | | WF/OHL |
| <i>Prunella modularis</i> | Dunnock | S | | LC | | O | | WF |
| <i>Pyrrhula pyrrhula</i> | Bullfinch | S | | LC | | O | | WF/OHL |
| <i>Regulus ignicapilla</i> | Common firecrest | S | | LC | | O | | WF/OHL |
| <i>Regulus regulus</i> | Goldcrest | S | | LC | | O | | WF/OHL |
| <i>Remiz pendulinus</i> | Eurasian Penduline-tit | | | LC | | O | | OHL |
| <i>Saxicola rubetra</i> | Whinchat | S | | LC | | O | | WF |
| <i>Saxicola rubicola</i> | European stonechat | S | | LC | | O | | WF/OHL |
| <i>Scolopax rusticola</i> | Eurasian woodcock | S | II, III | LC | | O | II | WF |
| <i>Serinus serinus</i> | European serin | S | | LC | | O | | WF/OHL |
| <i>Sitta europaea</i> | Nuthatch | S | | LC | | O | | WF/OHL |

| Species | English Name | Admin. instr. N. 18/2012 | Birds directive | Global IUCN | End/ R.R. | Obs. /Litt. | CITES | WF/OHL |
|--------------------------------|----------------------|--------------------------------|--------------------|----------------|--------------|----------------|-------|--------|
| <i>Streptopelia turtur</i> | European Turtle dove | | II | VU | | O | | OHL |
| <i>Sturnus vulgaris</i> | Common starling | | II | LC | | O | | OHL |
| <i>Strix aluco</i> | Tawny owl | S | | LC | | O | | WF/OHL |
| <i>Sylvia atricapilla</i> | Eurasian blackcap | S | | LC | | O | | WF/OHL |
| <i>Sylvia communis</i> | Greater whitethroat | S | | LC | | O | | WF/OHL |
| <i>Sylvia curruca</i> | Lesser whitethroat | S | | LC | | O | | WF/OHL |
| <i>Troglodytes troglodytes</i> | Wren | S | | LC | | O | | WF/OHL |
| <i>Turdus merula</i> | Blackbird | P | II | LC | | O | II | WF/OHL |
| <i>Turdus philomelos</i> | Song thrush | P | II | LC | | O | II | WF/OHL |
| <i>Turdus pilaris</i> | Fieldfare | S | II | LC | | O | II | WF/OHL |
| <i>Turdus viscivorus</i> | Mistle thrush | | II | LC | | O | II | WF/OHL |
| <i>Upupa epops</i> | Hoopoe | S | I | LC | | O | I | WF/OHL |

Bats recorded in the LSA

| Species | English Name | Global IUCN | Admin. instr. N. 18/2012 | Habitat Dir. | End/ R.R. | Obs. /Litt. | CITES | WF/OHL |
|----------------------------------|-----------------------------|-------------|--------------------------|--------------|-----------|-------------|-------|--------|
| <i>Barbastella barbastellus</i> | Western Barbastelle | NT | | II, IV | | O | | WF/OHL |
| <i>Eptesicus serotinus</i> | Serotine bat | LC | | IV | | O | | WF/OHL |
| <i>Hypsugo savii</i> | Savi's Pipistrelle | LC | | IV | | O | | WF/OHL |
| <i>Miniopterus schreibersi</i> | Schreiber's Bent-winged bat | NT | | II, IV | | O | | WF/OHL |
| <i>Myotis blythii</i> | Lesser Mouse-eared Myotis | LC | | II, IV | | O | | WF |
| <i>Myotis capaccini</i> | Long-fingered Bat | VU | | II, IV | | O | | OHL |
| <i>Myotis daubentoni</i> | Daubenton's Myotis | LC | | IV | | O | | OHL |
| <i>Myotis emarginatus</i> | Geoffroy's bat | LC | | II, IV | | O | | WF/OHL |
| <i>Myotis myotis</i> | mouse eared bat | LC | | II, IV | | O | | WF/OHL |
| <i>Myotis mystacinus</i> | Whiskered Myotis | LC | | IV | | O | | WF/OHL |
| <i>Nyctalus lasiopterus</i> | Giant Noctule | VU | | IV | | O | | WF/OHL |
| <i>Nyctalus leisleri</i> | Lesser Noctule | LC | | IV | | O | | WF/OHL |
| <i>Nyctalus noctula</i> | Common Noctule | LC | | IV | | O | | WF/OHL |
| <i>Pipistrellus nathusii</i> | Nathusius' Pipistrelle | LC | | IV | | O | | OHL |
| <i>Pipistrellus kuhlii</i> | Kuhl's Pipistrelle | LC | | IV | | O | | WF/OHL |
| <i>Pipistrellus pipistrellus</i> | Common Pipistrelle | LC | | IV | | O | | WF/OHL |
| <i>Pipistrellus pygmaeus</i> | Soprano Pipistrelle | LC | | IV | | O | | WF/OHL |
| <i>Plecotus spp. (genus)</i> | - | LC/NT | | IV | | O | | WF |
| <i>Rhinolophus euryale</i> | Mediterranean Horseshoe Bat | NT | | II, IV | | O | | WF/OHL |
| <i>Rhinolophus ferrumequinum</i> | Greater Horseshoe bat | LC | | II, IV | | O | | WF/OHL |
| <i>Rhinolophus hipposideros</i> | Lesser Horseshoe bat | LC | | II, IV | | O | | WF/OHL |

| | | | | | | | | |
|----------------------------|--------------------------|----|--|--------|--|---|--|--------|
| <i>Rinolophus mehely</i> | Mehely's Horseshoe Bat | VU | | II, IV | | O | | WF |
| <i>Tadarida teniotis</i> | European Free-tailed bat | LC | | IV | | O | | WF/OHL |
| <i>Vespertilio murinus</i> | Particoloured bat | LC | | IV | | O | | WF/OHL |

Mammals (other than bats) seen or potentially present in the LSA

| Species | English Name | Global IUCN | Admin. instr. N. 18/2012 | Habitat Dir. | End/ R.R. | Obs. /Litt. | CITES | WF/OHL |
|---------------------------------|-------------------------|-------------|--------------------------|--------------|-----------|-------------|-------|--------|
| <i>Apodemus flavicollis</i> | Yellow-necked mouse | LC | | | | L | | WF/OHL |
| <i>Apodemus sylvaticus</i> | Wood mouse | LC | | | | L | | WF/OHL |
| <i>Arvicola amphibius</i> | Northern water vole | LC | | | | L | | OHL |
| <i>Canis lupus</i> | Wolf | LC | | II, IV | | O | II | WF/OHL |
| <i>Capreolus capreolus</i> | Roe deer | LC | | | | L | | WF/OHL |
| <i>Clethrionomys glareolus</i> | Bank vole | LC | | | | L | | WF/OHL |
| <i>Dryomys nitedula</i> | Forest dormouse | LC | | IV | | L | | WF/OHL |
| <i>Erinaceus roumanicus</i> | White-breasted hedgehog | LC | P | | | L | | WF/OHL |
| <i>Felis silvestris</i> | Wild cat | LC | | IV | | L | II | WF/OHL |
| <i>Glis glis</i> | Edible dormouse | LC | | | | L | | WF/OHL |
| <i>Lepus europaeus</i> | Brown hare | LC | | | | L | | WF/OHL |
| <i>Martes foina</i> | Beech marten | LC | | | | L | | WF/OHL |
| <i>Martes martes</i> | Pine marten | LC | | | | L | | WF/OHL |
| <i>Meles meles</i> | Badger | LC | | | | L | | |
| <i>Micromys minutus</i> | Harvest mouse | LC | | | | L | | WF/OHL |
| <i>Microtus agrestis</i> | Field vole | LC | | | | O | | WF/OHL |
| <i>Microtus arvalis</i> | Common vole | LC | | | | O | | WF/OHL |
| <i>Mus musculus</i> | Mouse | LC | | | | L | | OHL |
| <i>Muscardinus avellanarius</i> | Common dormouse | LC | | IV | | L | | WF/OHL |

| Species | English Name | Global IUCN | Admin. instr. N. 18/2012 | Habitat Dir. | End/ R.R. | Obs. /Litt. | CITES | WF/OHL |
|-----------------------------|--------------------|-------------|--------------------------|--------------|-----------|-------------|-------|--------|
| <i>Mustela nivalis</i> | Least weasel | LC | | | | L | | WF/OHL |
| <i>Mustela putorius</i> | European polecat | LC | | | | L | | OHL |
| <i>Nannospalax leucodon</i> | Lesser mole rat | LC | | | | L | | WF |
| <i>Sciurus vulgaris</i> | Red squirrel | LC | | | | L | | WF/OHL |
| <i>Sus scrofa</i> | Wild boar | LC | | | | L | | WF/OHL |
| <i>Talpa coeca</i> | Mediterranean mole | LC | | | | L | | WF/OHL |
| <i>Talpa europaea</i> | Common mole | LC | | | | L | | WF/OHL |
| <i>Vulpes vulpes</i> | Red fox | LC | | | | L | | WF/OHL |



REPORT

Bajgora Wind Project
Environmental and Social Impact Assessment
Section 6C - Socio-Economic Baseline

Submitted to:

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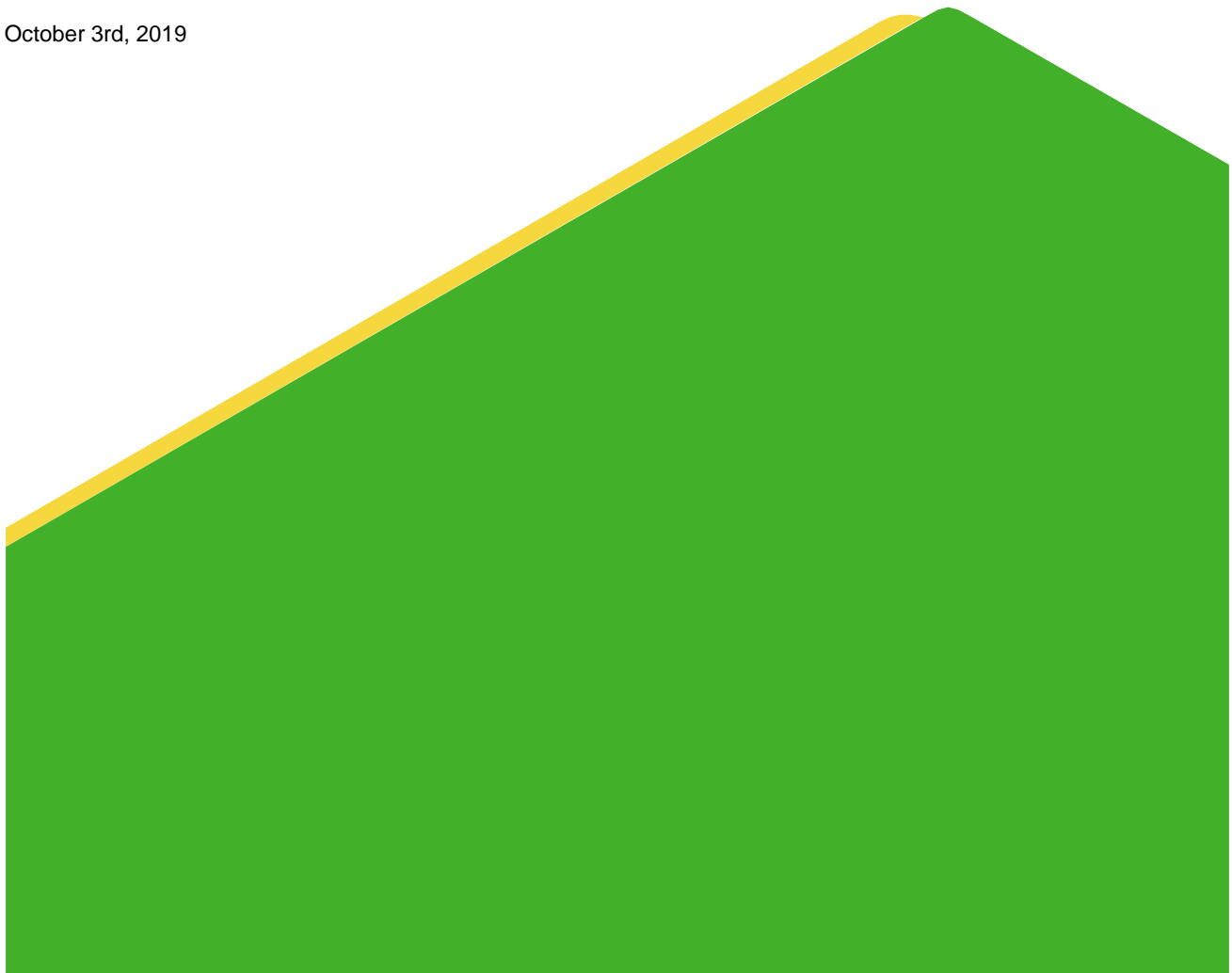


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APPENDIX A

Archaeological Consent for the Wind Farm and for the Overhead Line

6.0 C – SOCIAL BASELINE

6.1 Introduction

6.1.1 Definition of the Area of Influence

For the purpose of social baseline study, a Project Area of Influence (Aol) has been defined, considering the footprint of the Project and of the associated facilities. This Aol includes both villages directly impacted by the Project (i.e. villages in close proximity to the Project footprint) and villages indirectly affected. The latter include villages indirectly impacted by Project activities such as heavy traffic created during the transport of the turbines (villages of Stan-Tërg and Bare) or the construction of alternative road tracks which will reach the Project area of the Wind Farm (village of Kaçandoll).

Due to the different characteristics of the main Project components and their geographic extension, in addition to an overall Project Area of Influence, two smaller Areas of Influence have been identified for the Wind Farm and Overhead Line.

Based on these considerations, the villages listed in the table below have been included in the Aol. The table indicates the name of the village and the municipality it belongs to; in addition, indication is provided whether the village is part of the WF or the OHL Aol.

Table 1 Villages within the Project Area of Influence

| Municipality | Villages | Affected By |
|------------------|--|-------------|
| Mitrovicë | Bajgorë | OHL / WF |
| | Bare | WF |
| | Kaçandoll | WF |
| | Stan-Tërg | WF |
| | Rashan | OHL |
| | Tërstenë | OHL |
| Vushtrri | Gumnishtë | OHL |
| | Pasomë | OHL |
| | Sllatinë (Gjelbishtë) | OHL |
| | Banjskë | OHL |
| | Dobërllukë | OHL |
| | Neighbourhood of the city of Vushtrri ¹ | OHL |

¹ The affected neighbourhood of Vushtrri does not have a name or any other indication. Its location is indicated in the map

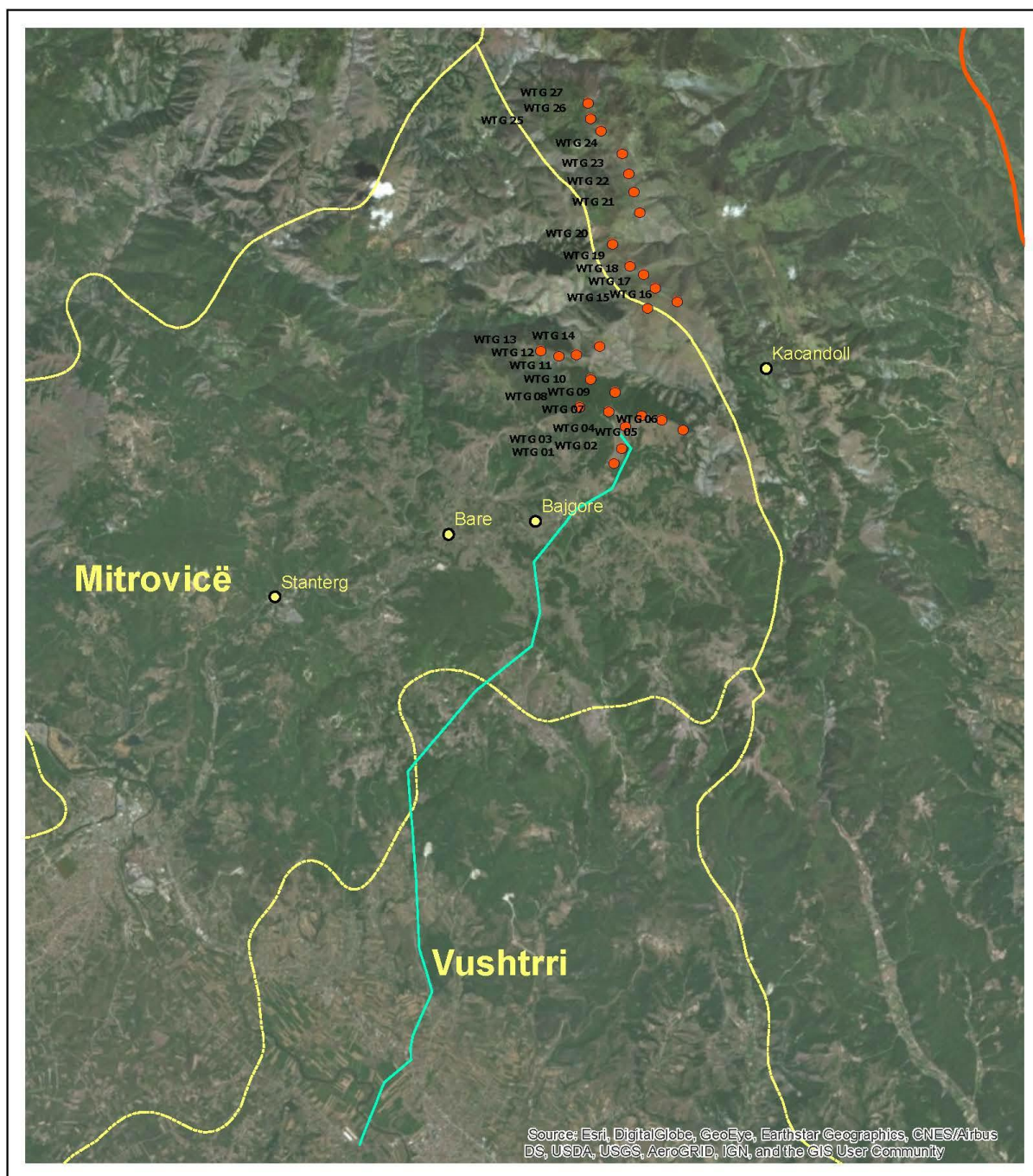
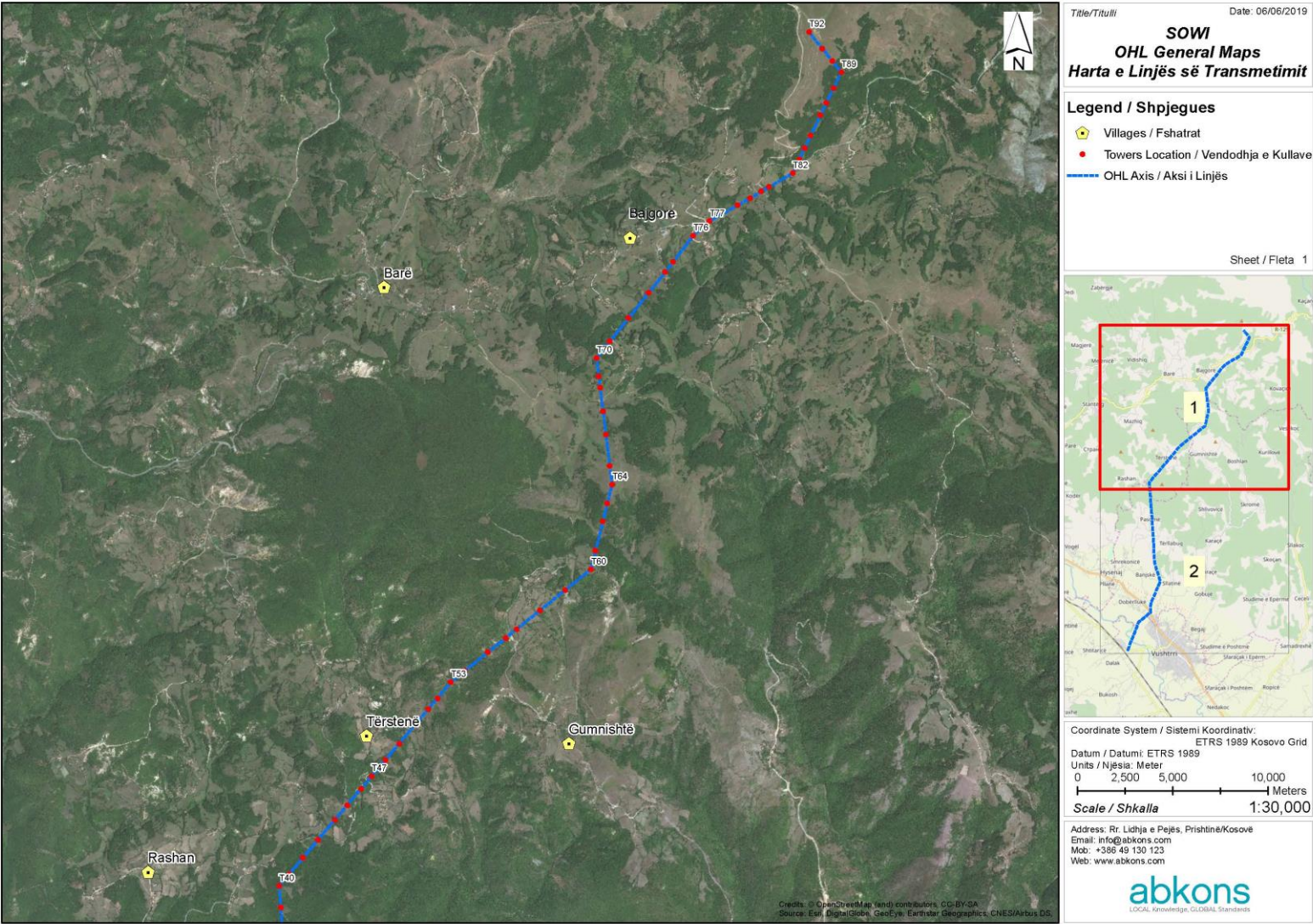


Figure 1: Villages in the WF AoI



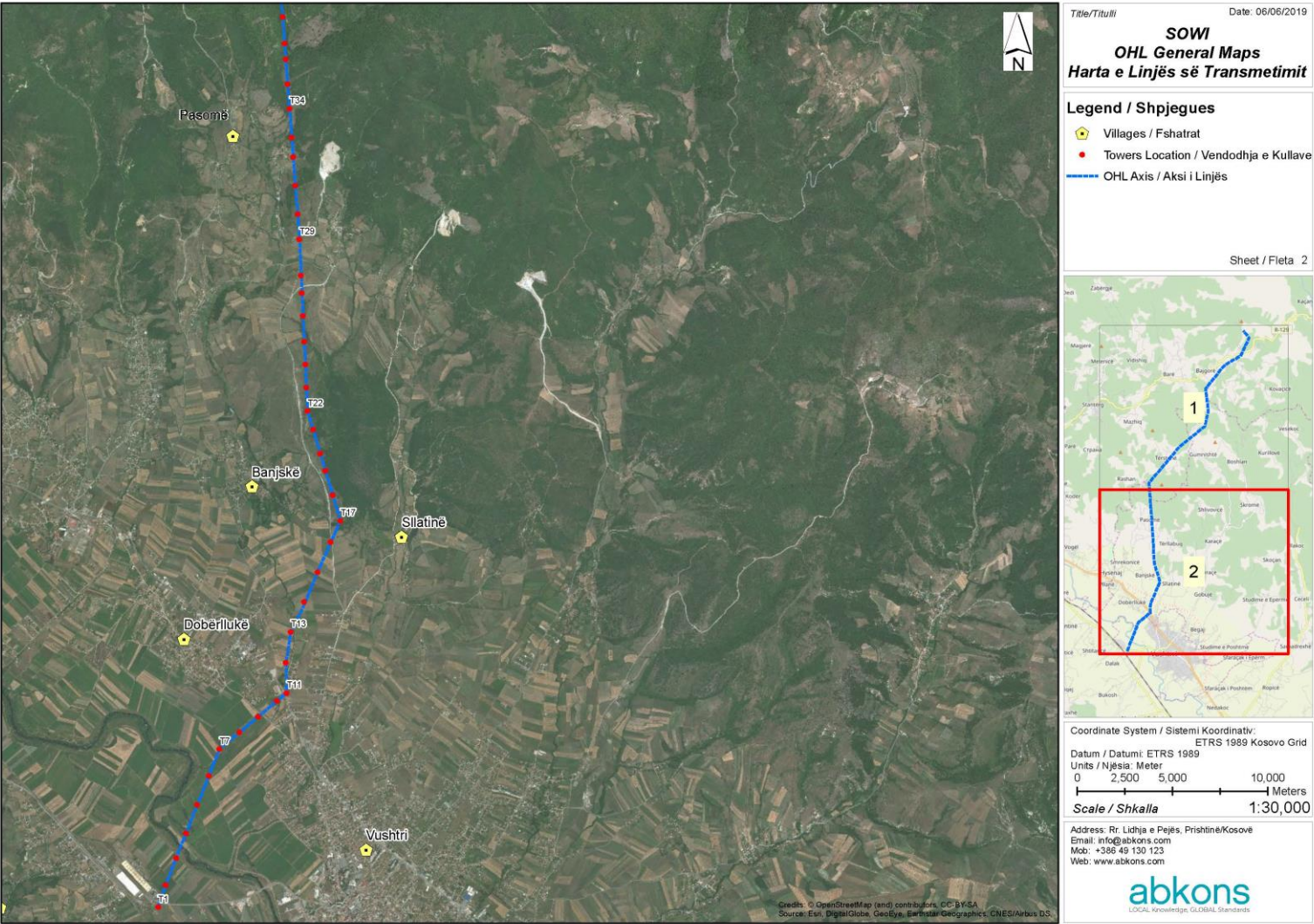


Figure 2: Villages in the OHL Aol



Figure 3: Vushtrri neighbourhood included in the Aol

Effort has been placed in collecting the most detailed and updated secondary data available. However statistical data is not always available at village level, therefore throughout the study information is in some cases provided at municipal or national level.

In addition, it should be noted that for the secondary data collection, different sources may provide different numbers. This is because the National Census of the Population of 2011 and the Civil Registry of the Municipalities use different approaches to population count. For example, the Civil Registry counts people based on their official Municipality of residence, however many people often leave a Municipality without communicating their new place of residence. This is an issue that still persists in all Kosovo. Sometimes the numbers of people residing in a certain Municipality are contradictory even between the same Institution, such as the Municipality which might give different data on population.

Another issue on data collecting is represented by the official place names of the villages. In the maps the villages are represented by their Slavic name when Kosovo was part of the former Yugoslavia, when nowadays a lot of these names have changed and have returned to the Albanian denomination. Sometimes even the pronunciation or different map fonts gives different names, like Kaçandoll or Kaçanoll or Kaqandoll. Another example is the village of Sllatinë (Slavic name) which now is registered as Gjelbishtë in the official Municipality registers, but even the employees continue to refer to as Sllatinë. Here below represented in the table the differences of place names in the Aol.

Table 2: Names of villages

| Official Place Names | Also Known as or Represented in the Maps as |
|----------------------|---|
| Bajgorë | Bajgorë |
| Bare | Bare |

| Official Place Names | Also Known as or Represented in the Maps as |
|----------------------|--|
| Kaçandoll | Kaçanoll or Kaqandoll |
| Stan-Tërg | Stari - Trg |
| Rashan | Rashan |
| Tërstenë | Tërstenë |
| Gumnishtë | Gumnishtë |
| Pasomë | Sumë (Name of the village till 1912, still used informally by the villagers) |
| Gjelbishtë | <u>Sllatinë</u> (Still used in all maps, also in official statements) |
| Banjskë | Bajë |
| Dobërllukë | Debërllukë |
| Vushtrri | Vučitrn (Slavic) in some is still used. |

6.1.2 Methodology used for the social baseline data collection

A combination of research methods was used to collect socio-economic data, including the following:

- Collection and review of secondary data;
- Collection and review of primary data through field studies, which included the following activities:
 - Reconnaissance survey to identify all communities that will be directly or indirectly affected and to alert community leaders and residents to the Project and to the proposed studies;
 - Key Informant Interviews (KII) with community leaders of the identified communities and local experts;
 - Focus Group Discussions (FGDs) with groups of adult Females, Farmers and Elderly;
 - Household interviews through a Sample Socio Economic Survey; and
 - Participatory tools used during FGDs and KII's, specifically community mapping, Statistical Package for Social Science (SPSS) software and case studies formulation.

When planning the field studies, the following criteria were followed to ensure the collection of sound and comprehensive baseline information:

- Adequate representation from all relevant social groups in each of the villages;
- Inclusion of groups/ individuals with different population characteristics/ socio-economic status;
- Participation of those with access to relevant information;
- Evidence of different types of livelihood activities;

- Inclusion of males, females and elderly where possible.

In order to understand the number of surveys required for the reconnaissance survey prior to the roll out of the actual surveys, a statistician provided estimates of household numbers based on secondary data sources. This guided the planning for the scale of the surveys required for each village.

The survey took place in the period from the 15th of January 2018 to the 15th of February for the Wind Farm Aol and from the 15th of April to the 15th of May 2019 for the OHL Aol.

The survey was carried out by a team of 5 members, 4 interviewers (in teams of 2) and a local guide who was more likely to have knowledge of the Aol and of its villages. The interviews were held following the best international practices, such as the Four Eyes Principle or the two-man rule. An overview of the Four Eyes Principle is described below:

Table 3: The Four Eyes Principle Overview

| Overview: Four Eyes Principle | |
|-------------------------------|--|
| Type | Risk Control Safety |
| Definition | Requiring two people to be physically present in the same place when an activity occurs. |
| Related Concepts | Risk |
| | Risk Control |
| | Safety |
| | Segregation of Duties |

Before carrying out the survey, a series of Public Community Meetings were held in the Aol villages. Participation to these meetings was very high, a description of the meetings and of their outcomes can be found in the Stakeholder Engagement Plan.

A description of the main activities carried out during the field survey is provided in the sections below.

6.1.2.1 Sample Socio Economic Survey

The Sample Socio Economic Survey was conducted using a questionnaire, which covered the following aspects:

- Demographic Section - To understand and assess the family composition, education, employment and incomes;
- Health Care Section - To understand and assess the health care system in the area and the vulnerability of families;
- Access to Infrastructure and Service Sector - To understand and assess the accessibility and availability of services provided to these communities, their perception on infrastructure and social services;
- Section of Agriculture Activity - To understand and assess the actual use of the land, the surface of the land owned and used, and the activities related to agriculture, forestry and pastures in the area;

The questionnaire aimed at collecting information on the social and economic situation of the families, on the land use and on the vulnerability of the families in relation to the implementation of the Project.

The number of interviews through the survey was determined based on the official 2011 Census data of Kosovo. According to the census, the OHL Aol has a total of 894 households². The city of Vushtrri was not taken into consideration in its entirety in this calculation, because, being more industrialised, it is not representative of the Project Aol that is a typical rural area. Instead, the neighbourhood in the premises of the OHL was taken into consideration in this study. For this survey 105 interviews were conducted, corresponding to 12% of the households in the area.

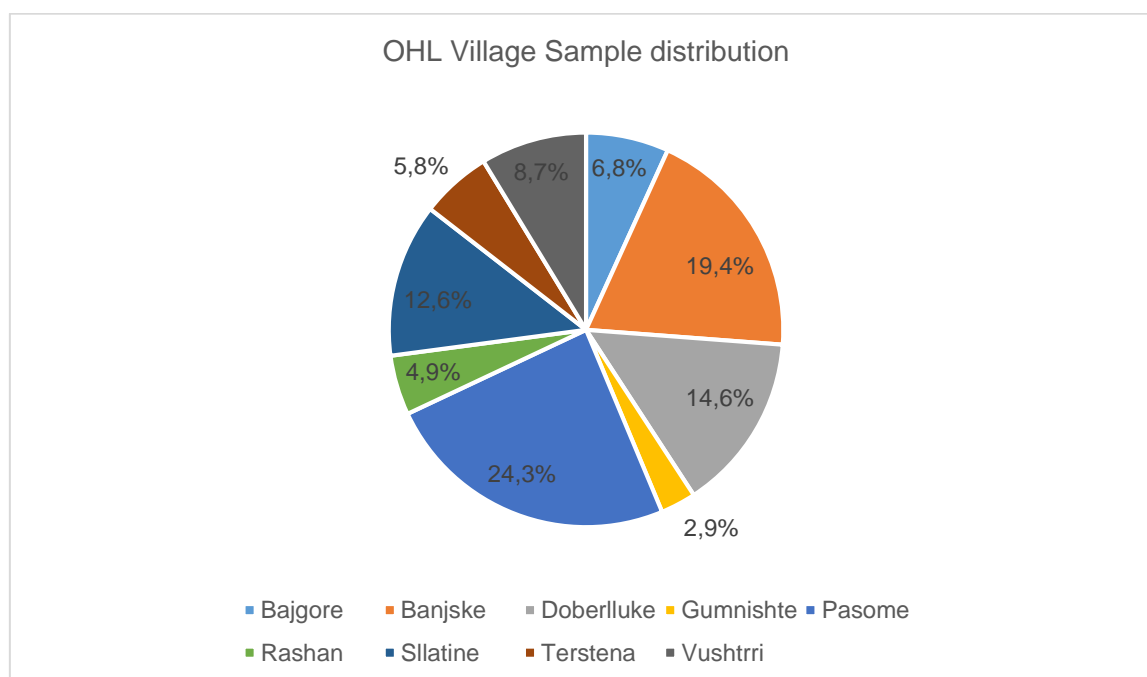


Figure 4: Sample Survey distribution for OHL Aol by village

With regards to the WF Aol, 117 household with a total of 688 people were interviewed. The chart below shows the sampling distribution of the villages. The village of Bajgorë constitutes the largest part of the sample, being the biggest village included in the project (54.70%). It is then followed by Bare, Stan–Tërg and Kaçandoll respectively.

² Data source – Kosovo Population and Housing Census 2011

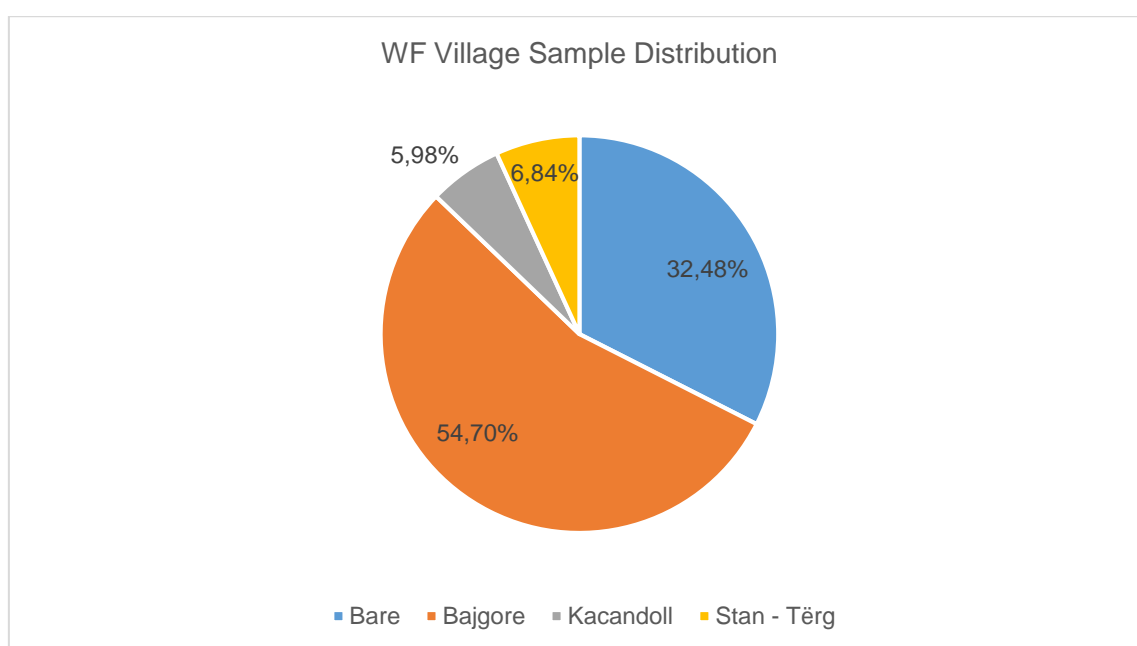


Figure 5: Sample Survey distribution for WF Aol by village

The following methods were used to evaluate and analyse the quantitative information as well as qualitative evidences obtained from the surveys:

- Demographic dispersion and GIS data - Demographic factors: number of people, location, population density, age etc.;
- Sample Socio Economic Survey questionnaires

6.1.2.2 *Focus Group Discussions and Key Informant Interviews*

A series of Key Informant Interviews and Focus Group Discussions (FGD) were held in parallel to the survey to obtain more detailed information.

In particular KII were performed with specialists in the following areas:

- Environment and Agriculture;
- Healthcare;
- Infrastructure;
- Employment.

In addition, for key informant interviews, a sample of local leaders in each community was selected including the traditional community leader (Head of the Village) or other men, women and other community leaders (in cases where the traditional leader was not available). This ensured that a representative sample of leaders was selected in each community. With regards to the OHL Aol a total of 6 KII were held during the survey involving 7 individuals. Of these KII, 3 were with Health Care workers of the villages of Pasome, Rashan and Doberlluke/Vushtrri and one KII was with the Director of the Department of Agriculture, Forestry and Rural Development of the Municipality of Vushtrri. For the WF Aol 4 KII were held during the survey with 6 individuals involving 3 health care workers in the villages of Bare and Kaçandoll during two interviews. Also, the Head of the Departments of Agriculture and Environment, Employment and Infrastructure of the Municipality of Mitrovicë, were involved during these KII to gain more detailed information on the villages affected by the WF Aol.

FGD were performed with the following categories of people, which are likely to result among the most vulnerable:

- Women;
- Elderly;
- Farmers.

With regards to the OHL AoI, 4 FGDs with women were organised, involving 11 women from the villages of Pasome, Rashan, Terstene, Sllatine and Banjske; these meetings were led by a female member of the Project team and were held at times and places that suit the women in each community. Two FGD with elderly involving 5 individuals were held in the villages of Pasomë and Banjskë. An FGD was held also with 6 farmers in the villages of Pasome, Gumnishte and Banjske. Also, an FGD was held with the Serbian Community in Banjske.

With regards to the WF AoI 2 FGD were held with 8 women in the villages of Bajgorë and Kaçandoll, 2 FGD with 4 farmers in Bajgorë and Bare and 2 FGD with 6 elderly in the villages of Bajgorë and Bare. In total 24 individuals were involved during these consultations. Eight out the nine women interviewed were teachers and the last woman interviewed was the representative of employment and social services in the City of Mitrovica.

All of the numerical data collected was entered into a database for analysis, to understand demographic trends within communities. All qualitative data was assessed according to the professional judgement of specialists.

6.1.3 Stakeholder Consultations

The objective of the consultation process is to present the proposed project and ESIA process to stakeholders and to identify associated issues, concerns and opportunities. The following tasks were undertaken:

- Identification of a preliminary list of stakeholders;
- Creation of background information document for use in communicating with stakeholders;
- Meetings with government departments and stakeholder groups; and
- Various focus group meetings with local community members.

A detailed stakeholder consultation process has been implemented throughout the ESIA process to assist in ensuring that all stakeholders have had the opportunity to provide input into the project planning process. This has also assisted in laying a sound foundation for building relationships with stakeholders for the ongoing engagement that will continue throughout the lifecycle of the Project. Further details on the stakeholder consultation process for the Project are included in the SEP.

6.2 Structure of the Social Baseline Data

This section provides information on the social and socio-economic baseline conditions in the Project AoI. The baseline provides a critical contextual component to benchmark existing conditions and to help identify and assess potential impacts of the Project.

The Social Baseline chapter is structured in the following chapters:

- Historical Framework;
- Administration and Governance;
- Demography, ethnicity, language and religion;
- Economy, employment and livelihood;

- Education;
- Transportation and traffic;
- Housing and infrastructures;
- Land use and ownership;
- Community health and safety;
- Cultural heritage;
- Ecosystem services;
- Main problems faced by households and community.

6.3 Historical framework

Covering an area of 10,908 square kilometres, Kosovo is landlocked in the centre of the Balkans and bordered by Serbia to the north and east, North Macedonia to the southeast, Albania to the southwest and Montenegro to the west. Most of central Kosovo is dominated by the vast plains and fields of Dukagjin and Kosovo.

Tensions between Kosovo's Albanian and Serb communities simmered through the 20th century and occasionally erupted into major violence, culminating in the Kosovo War of 1998 and 1999, which resulted in the withdrawal of the Yugoslav army and the establishment of the United Nations Interim Administration Mission in Kosovo. On 17 February 2008, Kosovo unilaterally declared its independence from Serbia. It has since gained diplomatic recognition as a sovereign state by 102 United Nations member states. Serbia does not recognize Kosovo as a sovereign state, although with the Brussels Agreement of 2013, it has accepted its institutions.

6.4 Administration and Governance

After the end of war in 1999 and under the administration of UNMIK (United Nations Interim Administration Mission in Kosovo), in 2000 Kosovo was divided into 7 Districts and 38 Municipalities. A municipality is the basic administrative division in Kosovo and constitutes the only level of power in local governance; municipalities are further divided into villages. Of the 38 municipalities, 27 of them have a majority of Albanian population, 10 have a majority of Serb population and 1 of Turkish population. All municipalities with Serb majorities have additional powers over the appointment of local police commanders and on the management of religious and cultural heritage sites, of universities and of secondary health facilities within their boundaries.

The city of Mitrovicë has been split into two parts: South Mitrovicë with an Albanian majority and North Mitrovicë with a Serb majority. Although both parts of the city are formally administered by the same local administration, North Mitrovicë is de facto ruled by an informal Serb administration. The city has always seen social tensions between Albanians and Serbs, being an area largely disputed by both sides.

The villages of Kosovo are administered by the Head of the Village, which is an old tradition among Albanian communities. They are now appointed by the Municipality, while in the past they were voted by the villagers and were generally persons who could settle disputes between villagers, propose communal investments for the village and serve as a reliable figure generally among the villagers. The actual Heads of Villages have now generally lost the authority they embodied in the past. They are now commonly elected by political credo and nominally carry the functions of formal representatives.

The elected head of villages of the Mitrovicë Municipality have been discharged more than a year ago but might still act as liaison elements between the project and the respective communities. Instead, for the Municipality of Vushtrri, the head of the villages are still in charge and hence can be considered representative figures of the

villages. Other figures can play a relevant role within village communities, such as former commanders of the Albanian Liberation Army or well respected figures among communities for their age, knowledge or wisdom.

Typically for the villages in this area, as well as generally in Kosovo, the neighbourhoods are made up of families belonging to the same extended family or clan, with their own cemetery and isolated from the other neighbourhoods/families in the village. It is therefore very difficult to find villages in Kosovo that might be mixed together in larger neighbourhoods.

6.5 Demography, Ethnicity, Language and Religion

The population of Kosovo, as defined by Agency of Statistics, was estimated during the last census of 2011 to be of 1,739,825 persons. In the years since the last Census, although the figures are unofficial, it is believed that nearly 170,000 people have left Kosovo to emigrate (informally, legally, asylum seekers) mostly to Switzerland and Germany (where the biggest Kosovar diaspora communities live), but also in the Scandinavian countries. Kosovo is characterized by a very young population, as the average age is 30.2 years. According to the estimation of Kosovo Agency of Statistics, the average life expectancy for 2011 in Kosovo for both sexes was 76.7 years. Women had a longer life expectancy of 79.4 years, whereas for men it was 74.1 years.

As previously indicated, the Aol is located partially within the Municipality of Mitrovicë and partly within the Municipality of Vushtrri. Table 4 presents the official population numbers based on the 2011 census of the Municipalities of Mitrovicë and Vushtrri; however, the 2016 projections foresaw a decrease of 2.2% for the Municipality of Mitrovicë and 1.7% for the Municipality of Vushtrri. These are informal estimates of the administration of these municipalities, since there are also people migrating to other parts of Kosovo, usually in Prishtina, but they tend not to change their formal residency.

Table 4: Population of Municipalities of Mitrovicë and Vushtrri

| Municipality | Vushtrri | Mitrovicë |
|--------------|-----------------------------|-----------------------------|
| Population | 69,871 | 71,909 |
| Area | 345 km ² | 350 km ² |
| Density | 200 persons/km ² | 213 persons/km ² |

(Source: <http://ask.rks-gov.net>)

As indicated in the table above, the Municipalities of Mitrovicë and Vushtrri are similar in terms of population and area; Mitrovicë has a slightly higher population density, as shown also in the figure below.

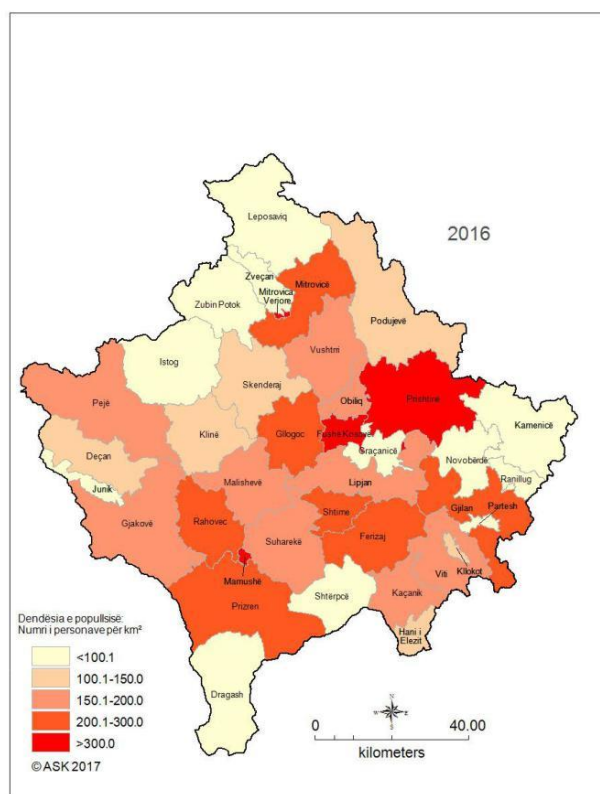


Figure 6: Population density in Kosovo (Source: <http://ask.rks-gov.net>)

The table below presents more detailed data relative to the villages within the AoI, also in terms of gender and ethnicity; the data derives from the 2011 census and may therefore have been subject to changes due to emigration, as previously mentioned.

Table 5: Number of inhabitants of the villages within the Aol (Municipality of Mitrovicë)

| Settlement, type of area | Total | Sex | | Ethnicity | | | | | | | | | | |
|-----------------------------|--------|--------|--------|-----------|---------|---------|---------|------|---------|----------|--------|--------|-------------------------|-------------|
| | | Male | Female | Albanian | Serbian | Turkish | Bosnian | Roma | Ashkali | Egyptian | Gorani | Others | Prefer not to answer | Data N/A |
| MUNICIPALITY OF MITROVICË | | | | | | | | | | | | | | |
| Total | 71,909 | 36,275 | 35,634 | 69,497 | 14 | 518 | 416 | 528 | 647 | 6 | 23 | 47 | 61 | 152 |
| Urban | 46,132 | 23,046 | 23,086 | 43,819 | 14 | 515 | 359 | 528 | 647 | 6 | 23 | 42 | 57 | 122 |
| Rural | 25,777 | 13,229 | 12,548 | 25,678 | - | 3 | 57 | - | - | - | - | 5 | 4 | 30 |
| | | | | | | | | | | | | | | |
| Bajgorë | 1,098 | 572 | 526 | 1,097 | - | - | - | - | - | - | - | - | - | 1 |
| Bare | 841 | 419 | 422 | 841 | - | - | - | - | - | - | - | - | - | - |
| Kaqandoll | 119 | 65 | 54 | 119 | - | - | - | - | - | - | - | - | - | - |
| Rashan | 364 | 208 | 156 | 363 | - | - | - | - | - | - | - | - | - | 1 |
| Stan-Tërg | 1,042 | 511 | 531 | 1,035 | - | - | 5 | - | - | - | - | - | - | 2 |
| Tërstenë | 163 | 86 | 77 | 162 | - | - | 1 | - | - | - | - | - | - | - |

(Source: 2011 Kosovo National Census)

Table 6: Number of inhabitants of the villages within the Aol (Municipality of Vushtrri)

| Settlement, type of area | Total | Sex | | Ethnicity | | | | | | | | | | |
|--------------------------|--------|--------|--------|-----------|---------|---------|---------|------|---------|----------|--------|--------|----------------------|----------|
| | | Male | Female | Albanian | Serbian | Turkish | Bosnian | Roma | Ashkali | Egyptian | Gorani | Others | Prefer not to answer | Data N/A |
| MUNICIPALITY OF VUSHTRRI | | | | | | | | | | | | | | |
| Total | 69,870 | 36,004 | 33,866 | 68,840 | 384 | 278 | 33 | 68 | 143 | 1 | 3 | 50 | 17 | 53 |
| Urban | 29,964 | 13,704 | 13,260 | 26,518 | 4 | 276 | 17 | 1 | 101 | 1 | 3 | 4 | 16 | 23 |
| Rural | 42,906 | 22,300 | 20,606 | 42,322 | 380 | 2 | 16 | 67 | 42 | - | - | 46 | 1 | 30 |
| | | | | | | | | | | | | | | |
| Banjskë | 891 | 449 | 442 | 877 | 4 | - | 1 | - | - | - | - | 1 | - | 8 |
| Dobërlukë | 1,629 | 811 | 818 | 1,629 | - | - | - | - | - | - | - | - | - | - |
| Gumnishtë | 65 | 32 | 33 | 65 | - | - | - | - | - | - | - | - | - | - |
| Pasomë | 744 | 384 | 360 | 744 | - | - | - | - | - | - | - | - | - | 1 |
| Sllatinë | 491 | 250 | 241 | 490 | - | - | - | - | - | - | - | - | - | 1 |

(Source: 2011 Kosovo National Census)

As indicated in the tables above, the village with the largest population is Dobërllukë, within the Municipality of Vushtrri; the village with the smallest population is Gumnishtë, also within the Municipality of Vushtrri.

The demographic trend in the Aol follows the general phenomenon of people emigrating especially from rural to urban areas and from Kosovo to foreign countries; both the war and the lack of employment have played a significant role in these emigration phenomena. Free and uncontrolled movement of population have changed the ratio between urban and rural population. According to population census of 2011, 61% of the population lives in rural areas.

A significant case within this trend is represented by the village of Gumnishte, where currently there are only 3 families, instead of the 43 families that were living in this village before 1998. Similarly, the population in Rashan has also decreased through the years.

A different case is the village of Banjske, which is very near the city of Vushtrri and the highway from Prishtina to Mitrovicë and has seen an increase of population and construction of new houses, although this has not been still reflected in the official demographic data of the Municipality of Vushtrri.

The table below gives an insight about the natural growth ratio in the Municipalities of Mitrovicë and Vushtrri. As shown in the table, this ratio has been generally constant in the period 2011-2016 in the Municipality of Mitrovicë, while in the Municipality of Vushtrri the natural growth has seen a decrease, mainly due to the reduction in the number of births.

Table 7: Natural growth in the Municipality of Mitrovicë

| Year | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
|-------------------|------|------|------|------|------|------|
| Live Birth | 1436 | 1616 | 1461 | 1849 | 1633 | 1587 |
| Deaths | 330 | 576 | 333 | 434 | 388 | 395 |
| Difference | 1106 | 1040 | 1128 | 1415 | 1245 | 1192 |

(Source: <http://ask.rks-gov.net/Stat/Stat1/data/web/stat.html>)

Table 8: Natural growth in the Municipality of Vushtrri

| Year | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
|-------------------|------|------|------|------|------|------|
| Live Birth | 1316 | 1167 | 1262 | 1091 | 964 | 993 |
| Deaths | 311 | 339 | 325 | 334 | 329 | 372 |
| Difference | 1005 | 828 | 937 | 757 | 635 | 621 |

(Source: <http://ask.rks-gov.net/Stat/Stat1/data/web/stat.html>)

Religious structure of the population

The Municipality of Mitrovicë can be considered as multi-ethnic as other parts of Kosovo, but the Albanian community is the majority. According to the census of 2011, 99.3% of population living in this municipality declared themselves as Muslim, while the rest are Orthodox, Catholic or of other religions; 0.28% have decided not to declare their religious faith. Also, in the Municipality of Vushtrri, the Albanian community is the majority and 99.2% of the population have declares themselves as Muslim. The Orthodox community, basically the Serbian community in Vushtrri, shows a very small percentage, mainly due to the fact that Serbians refused to

respond to the National Census of 2011; the actual number is expected to be higher, however no reliable data is available.

Table 9: Religious composition of the population living in Municipality of Mitrovicë and Vushtrri

| Religion | % Municipality of Mitrovicë | % Municipality of Vushtrri |
|--------------|-----------------------------|----------------------------|
| Islam | 99.3 | 99.2 |
| Orthodox | 0.02 | 0.55 |
| Catholic | 0.06 | 0.03 |
| Other | 0.04 | 0.06 |
| Atheist | 0.02 | 0.03 |
| Not declared | 0.28 | 0.13 |

(Source: <http://ask.rks-gov.net/Stat/Stat1/data/web/stat.html>)

6.5.1 Vulnerable Groups in the Area of Influence

Vulnerable groups include people who, by virtue of gender, ethnicity, age, physical or mental disability, economic disadvantage or social status may be more adversely affected by a project than others, and who may be limited in their ability to take advantage of a project's development benefits³.

Within the AoI, the following groups have been identified as vulnerable:

- Women;
- Farmers;
- Ethnic minorities (mostly Serbs);
- Economically or socially disadvantaged households.

Women have been identified as a vulnerable group due to their economic vulnerability and difficulty to participate in decision-making processes within the traditional context. Women in the AoI may not always be able to attend or speak freely at open meetings and/or may have household restrictions on when they are able to attend such meetings. It should be noted that female-headed households might be underreported, as it is culturally held that a man is the head of the household even if that man is not a permanent resident or is a male member of the extended household. Only two interviewees were women, which were widowed. Nevertheless, the gender situation in terms of employment and education is reported by the men in the family.

Farmers have been identified vulnerable to Project related impacts, particularly if the land on which their livelihoods are dependent is taken and not compensated for adequately.

Ethnic minorities have been identified as vulnerable due to their lack of opportunity to participate in decision making systems within the local cultural context. Based on outcomes of the survey, 34 people in the village of Banjske were identified as belonging to the Serbian community. The Serbian community is considered

³ EBRD definition for Vulnerable group

vulnerable since after the war of 1998-1999 it has been marginalized within villages and employment opportunities for its members have been reduced, leading to massive emigration and to the abandonment of their houses and properties. The small number of the people belonging to this community in the Aol and the isolation from the rest of the Serbian population are also elements that increase the vulnerability status.

Finally economically or socially disadvantaged households are identified as vulnerable, because of the risk that their livelihood status may be more adversely affected by the PProject than others, particularly due to land acquisition. The table below shows the vulnerable households across different categories; in particular it presents the number of households interviewed during the socio-economic survey that fit within the categories of economically or socially disadvantaged households and may be at a higher risk of being adversely affected by the Project.

Table 10: Households identified during the Survey that fall under the category of economic or social vulnerability

| Category of economic or social vulnerability | Number of households | Percentage |
|---|----------------------|------------|
| Low-income households (reporting less than 150 Euro/monthly household income, and for larger households between 150 and 300 Euro/month) dependent on agriculture for their livelihood | 13 | 6 % |
| Single-parent led families | 2 | 1 % |
| Widows (single member households) 65 years of age or older | 2 | 1 % |
| Households who rely on social assistance for income | 23 | 11 % |
| Households with a member who has a physical and/or mental disability | 7 | 3,2 % |
| Households where the majority of adult members are unemployed | 22 | 10 % |
| Households with limited access to basic services and infrastructure (i.e. roads, health services, education) | 4 | 2 % |

As shown in the table above, almost one third of households fall under the classification of economic vulnerability. The highest number of vulnerable families are those that rely on social assistance and where the majority of adult members are unemployed. These categories are considered vulnerable during the land acquisition and negotiation process. Households who have a member that has a physical or mental disability have been considered as vulnerable due to difficulties in mobility (reach the land plot for inventory) or comprehension issues (difficulties in understanding the process and the agreements).

6.6 Economy, employment and livelihood

6.6.1 Working Practices and Labour Rights

The “Law No.03/L –212 On Labour” regulates all employment contracts and working conditions in Kosovo. This Law was developed in line with the ILO conventions and the European Union Legislation.

The economy of Kosovo has changed since it was part of the former Yugoslavia, when industry was the biggest employer. Now Kosovo relies more on the service sector and the employment in the public service sector. The situation in the Aol is not different from the rest of Kosovo.

Informal employment occurs in Kosovo, especially in the private sector, but there are no recent statistics of the numbers of informal employees. Informal employment was not reported by respondents during the surveys; this may be due to the fear of the respondents to lose the social assistance, hence it cannot be ensured that informal employment does not occur within the Aol.

Child labour is infrequent in Kosovo, although in 2017⁴ 206 children were reported to be employed in heavy labour. In some cases, children might also help their parents in rural villages with agriculture activities, even though during the survey none of the respondents reported of child labour in the Aol.

6.6.2 Economy and employment

Approximately 490,100 or two thirds of the Kosovar population, is considered in the working age (15-64 Years old). Of these, 59.1% are not economically active, that means that they are either unemployed or have not searched for a job in the past 4 weeks and are unable to start a job in the next two weeks⁵. Within the population that is economically active, 29.6% is unemployed (144,972 people). This means that 28.8% of population in working age are employed (345,131 people). The employment rates between men and woman have marked differences. While 45.3 % of men in working age have a job, for women this rate is at only 12.3 %⁶.

Looking at the situation in the Aol, an important role in terms of employment was represented by the Trepca Mine, a mine very rich in minerals, especially gold, lead and zinc. The mine had more than 24,000 employees until the 1990's and was hence the biggest employer in this area. After the independence of Kosovo, the mine lost its prominence due to damages suffered during the war and lack of investments in infrastructure and technology and it now employs only 1,430 people, losing therefore its role as the most important employer of the area. Mitrovicë witnessed also the closure of the biggest battery factory of the former Yugoslavia that was a very large employer in the city. Both these activities have not been replaced by others, therefore making the Municipality of Mitrovicë an area suffering from one of the highest rates of unemployment in Kosovo (more than 50%).

The table below presents the employment rates of the population within the Municipalities of Mitrovicë and Vushtrri based on sectors of employment.

Table 11: Employment rates based on sector in Municipalities of Mitrovicë and Vushtrri

| Employment based on sector | Municipality of Mitrovicë % | Municipality of Vushtrri% |
|-----------------------------------|-----------------------------|---------------------------|
| Agriculture, Hunting and forestry | 0.8 | 3.1 |
| Fishery | 0.01 | 0.01 |
| Mining and quarry | 4.8 | 1.0 |
| Production | 9.1 | 7.3 |

⁴ ASK – Agency of Statistics of Kosovo – 2018

⁵ ASK – Agency of Statistics of Kosovo – 2018

| Employment based on sector | Municipality of Mitrovicë % | Municipality of Vushtrri% |
|--|-----------------------------|---------------------------|
| Electrical energy, gas and water supply | 3.3 | 12.0 |
| Construction | 5.2 | 4.3 |
| Trade, car and motorcycle repair, home appliances repair | 17.8 | 16.7 |
| Hotels and Restaurants | 4.8 | 4.4 |
| Transportation, storage and traffic | 6.1 | 4.7 |
| Financial services | 2.3 | 1.9 |
| Real estate | 4.3 | 4.7 |
| Public administration and security service | 14.3 | 16.8 |
| Education | 13 | 12.1 |
| Health and social services | 6.5 | 5.0 |
| Personal activities, others | 4.6 | 4.1 |
| Family activities | 0.6 | 0.2 |
| International organization and community | 2.3 | 1.8 |

(Source: <http://ask.rks-gov.net/Stat/Stat1/data/web/stat.html>)

Looking more specifically at the results of the survey in the OHL Aol, the public and private sectors are the biggest employers, but one of the main sources of income is represented by pensions received by retired workers/pensioners. The rest earn a living from farming. The unemployed represent 22% of respondents, with women being at nearly 80% of total. During the Survey in the Aol, female respondents were asked whether they considered themselves as housewives or unemployed: 49% of them identified themselves as housewives while 31% as unemployed. It should be noted that the difference between these definitions is not always easy to grasp for respondents due to cultural background: especially in rural and remote areas where women consider themselves as housewives, while near and within the urban areas as unemployed. 5.9% of the women were employed in the public sector as teachers or health care worker, and only 2% of them were employed in the private sector.

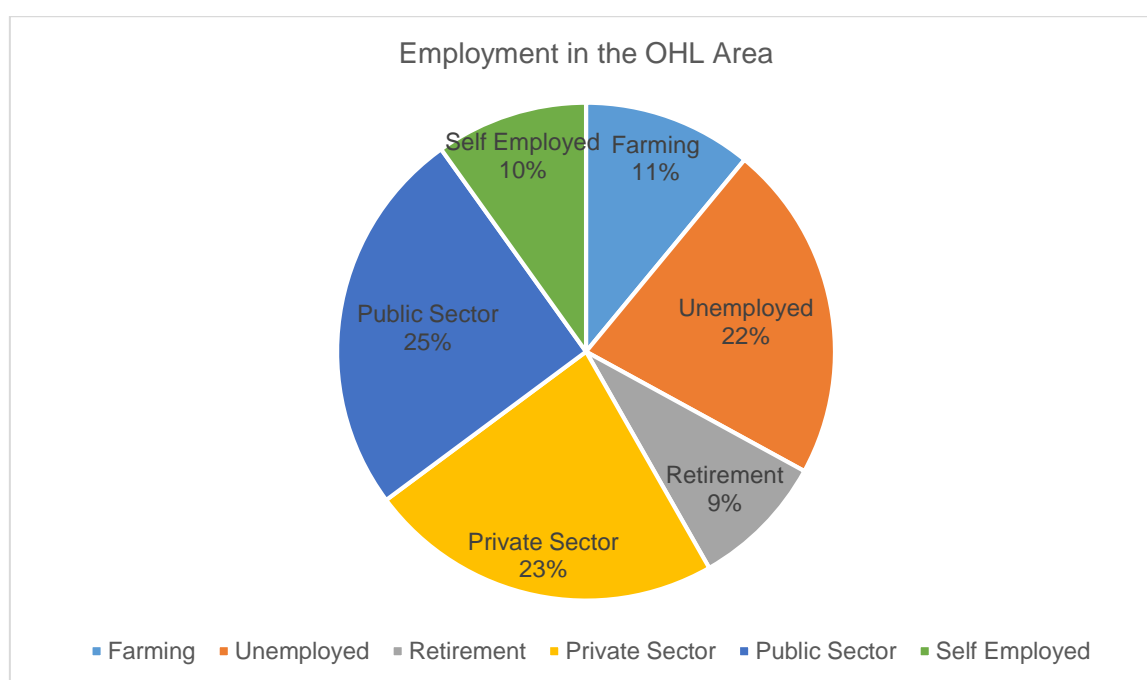


Figure 7: Employment in OHL Aol according to Survey

Livestock rearing is not very significant in the OHL Area, particularly in the villages near the city of Vushtrri, where households tend to have one or two cows per family for their personal needs or no livestock at all. Beekeeping was reported from 4 households, with only one household that reported more than 15 beehives in the village of Gumnishte.

The main crops produced in the area are maize, potatoes and peppers. Other annual crops include, albeit in smaller quantities, grain and cultures such as onions, tomatoes, cabbage and other gardening cultures, most of the latter planted in small plots of land near the houses.

The orchard cultures are not widespread in the area and do not represent an important source of income because of the particular climate conditions of the study area, but also due to the fact that in Kosovo the cultivation of fruit trees and orchards has not historically been a primary activity. Usually fruit trees are planted in small plots near the houses and vary considerably, from apple to plums, but especially quince, that is used to make jam.

The land is mostly cultivated. Only 18.4% of the respondents report to have none of their plots cultivated. Other families have partially or completely used their land for farming.

The most common crops cultivated are garden crops (72.8%), which are used mainly to satisfy the family needs and sometimes also for selling purposes, which allows some extra income for the family.

In fact, only very few families cultivate their land in order to sell the produce as a real business. As the chart below shows, only 1% of the respondents report to use their garden produce for selling.

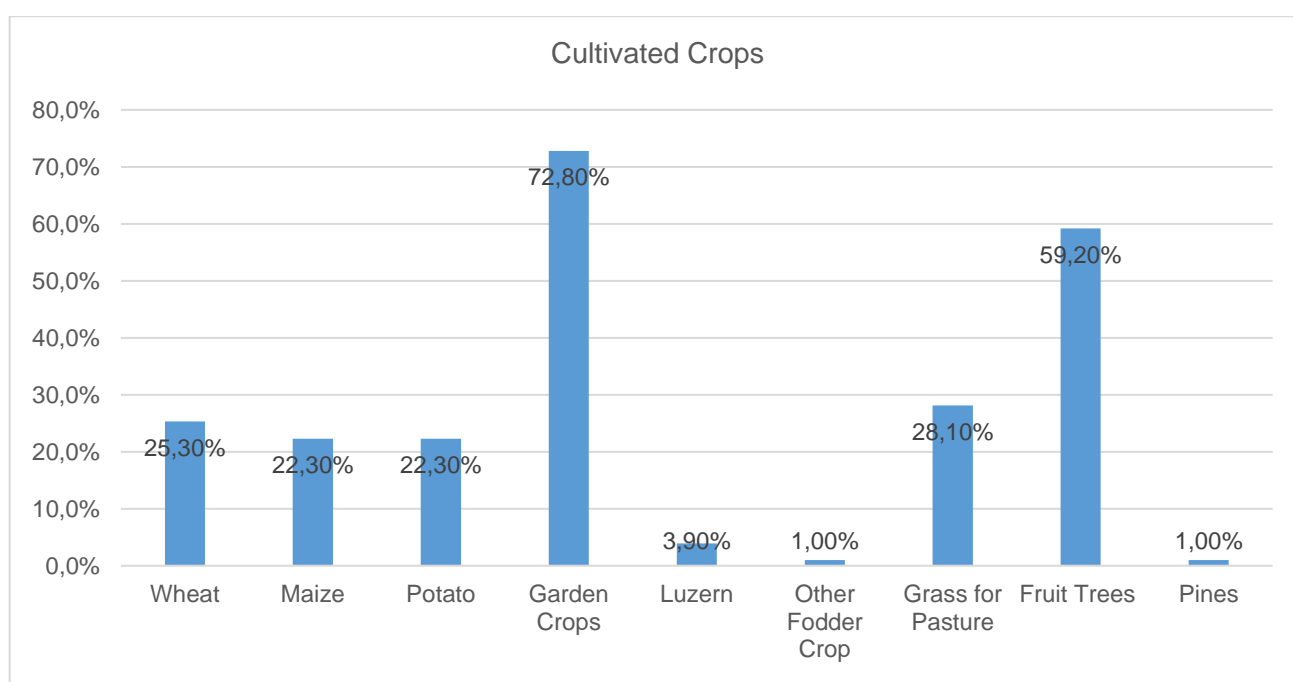


Figure 8: Cultivated crops in the OHL Aol according to Survey

Besides garden crops, the next cultivated product is fruit trees (59.2%). These seasonal products are not very costly and at the same time they bring quite a lot of profit for the family whether they sell the product or just use it for personal needs. The varieties of fruit trees vary depending from the location of the land, but these are not cultivated in extensive operations. Rather, families tend to cultivate different types of fruit trees for their own needs.

Furthermore, grass for hay (28.1%), being the next most cultivated crop is beneficial to the residents and their family income as they are also raising livestock for their family needs. In this way they fulfil the need for meat and dairy products for the family.

It must be noted that no women were declared as farmers, while from the FGDs it appears that some of them declare that they help men in some activities, but do not work in agriculture activities, other than some livestock caring.

Looking at the WF Aol, unemployment rates are lower than in the OHL Aol, as only 12% of respondents were identified as unemployed. Farming plays a more important role, as 41% of the respondents are employed in this sector, while the private sector plays a marginal role (7% of interviewees).

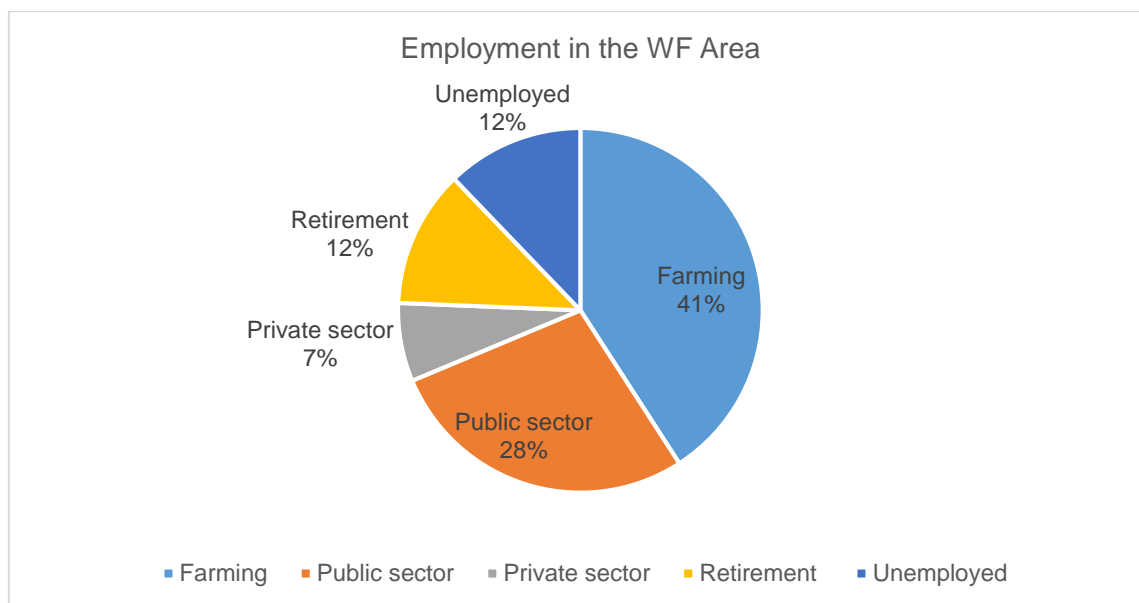


Figure 9: Employment in the WF Aol according to Survey

Most of the respondents reported that farming is the main activity (41%). The public sector covers 28% of the families in the survey, where most of the jobs are related to the Trepca mine. Private sector covers 6.84% of the families and unemployment, same as retirement, is reported at a level of 11.97% of the respondents in the survey.

With regards to farming activities in the WF Aol, the majority of the land is used as pasture/grazing for the livestock. It is important to say that the agriculture is not very developed because the farmers are very limited in the crops they can cultivate due to climatic conditions (approximately 1500 m above the sea), difficult terrain, irrigation and drainage.

Livestock appears to be an important activity for the families in the WF Area, especially for the villages of Bare, Bajgorë and Kaçandoll due to their geographical position and the presence of more grazing areas. Usually, the grazing or pasture areas are not fenced. The only fenced private properties are those near the private houses, basically the garden surrounding the houses. The areas are left for the whole community to graze their livestock without any restrictions. These communities are usually very connected with each other and the grazing and pastures might be considered as communal. These are also areas with naturally grown grass and not planted by the owners. The main animals reared are cows (although most of the families owns one or two cows just for family needs) chicken, goats and other domestic animals. Land and crops are also used to serve livestock, for food and rearing. Therefore the food for livestock is provided from the households' own parcels in 70% of the cases, and both from their own and public parcels in 30% of the cases.

The main income from the livestock usually comes from selling milk and meat from cows and goats and eggs from the chicken. These are also used for family needs usually and no dairy products are produced except for family use. The milk is usually collected from the dairy producers of Mitrovicë and Podujeva, the nearest cities, even for the cattleman that owns a considerable number of cows. The FGD shows that only the major cattlemen in the area sell their products and do not use them just for family consumption. Regarding beekeeping only one family reported this activity.

In the Aol, although there is abundance in forestry, the secondary products are absent and due to cultural and historic lack of gathering of mushrooms or truffles and other products, this activity is not a base for incomes.

There are no other major activities or investments in the area, neither private nor state based. Small private activities, usually small shops or mechanical workshops are dispersed in the Aol and of small size. Very few service activities such as restaurants or bars are present.

6.6.3 Livelihood

According to results of the survey, respondents in the Aol are living with a monthly average income of 133 Euro per capita, while the national average is 297 Euro per capita⁷. Low average incomes are generally due to unemployment, which is considered the biggest challenge this community faces.

Looking at the OHL Aol, according to results of the survey, 63% of respondents perceived their status to be similar to that of other neighbouring families, 7% perceive their family status to be worse than that of the others, 23% report that they have a better status than others and only 2% claim to have a much better status than others.

The majority of the households in the area report a total combined income of between 150 to 800 Euros. 150 – 300 Euro (26.2%), 300 – 500 Euro (20.4%) and 500 – 800 Euro (32%).

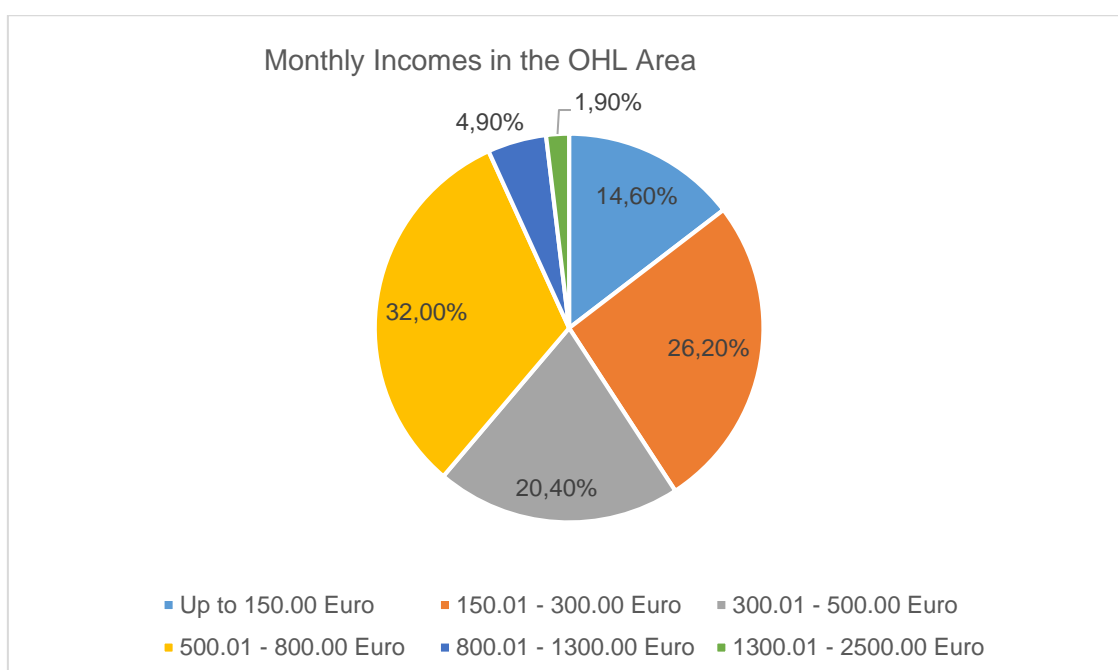


Figure 10: Average monthly household incomes in OHL Aol according to Survey

It must be noted that most of those who declare less incomes, are usually situated in the most profound rural areas, but they are also those who declare less expenses on food, since they usually cultivate the necessary for food in their parcels or garden.

Moreover, a significant portion of the families in the Aol (~11%) consider social assistance to be a crucial income generator for the family. It is understandable that the families that obtain social assistance will have no other important income generating activity, and for this reason have been identified as vulnerable, as indicated in section 6.5.1.

Looking at the OHL Aol, according to results of the survey, households reported of an average income between 150 to 800 euro, but most of them (32%) live with an income between 300 and 500 euros.

⁷ <http://ask.rks-gov.net/sq/agjencia-e-statistikave-te-kosoves/add-news/vjetari-statistikor-i-republikes-se-kosoves-2019>

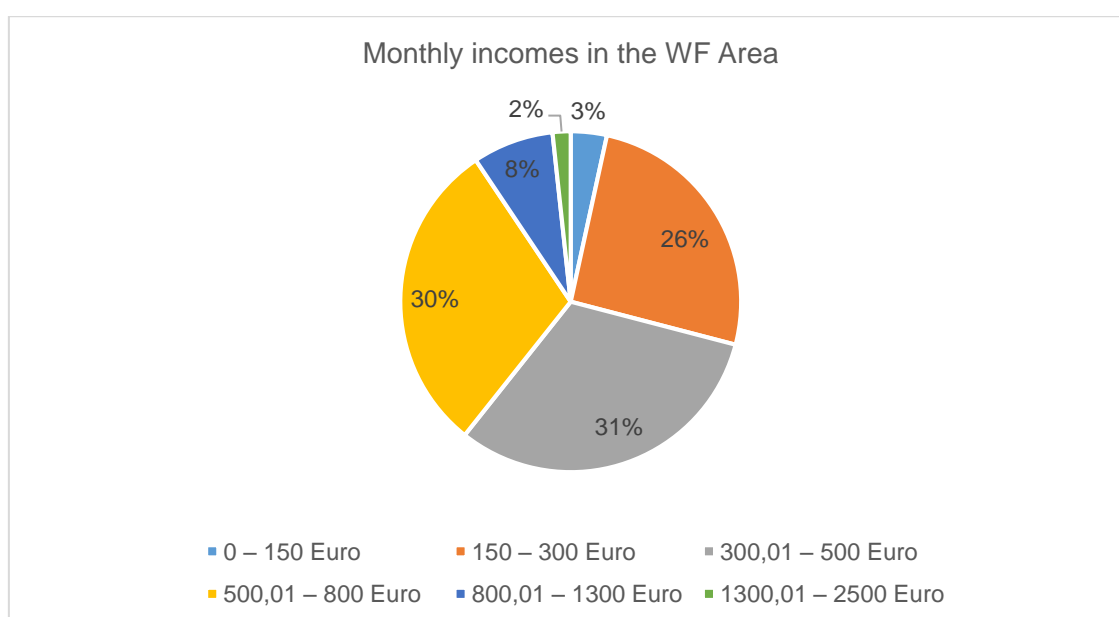


Figure 11: Average monthly household incomes in WF Aol according to Survey

A source of income for many households in the Project Aol are the remittances of family members living abroad. For Kosovo as a whole, for 2018, remittances amounted to more than 800 Million Euro, becoming an important factor in the economy of the country. During the surveys, most of the respondents could not define the amount of income coming from remittances, with said income being usually a “una tantum” income, obtained when the family member comes back to the country or when single payments are made from time to time, but not in monthly instalments.

All respondents are male, since it is cultural mentality in Kosovo that the man in the household is considered the most authoritative figure, therefore it was them that wanted to answer on behalf of their family. Based on the outcomes of the surveys, it can be noticed that the households have limited incomes compared to the national average (due to the income sources), so the families in the area Aol have low consumptions of goods.

The cost of living in the rural areas and isolated villages is lower than near the cities. On the other hand, this may change during winter, when these villages may become isolated due to bad weather and snow thus increasing transport costs and related expenses, since most goods have to be brought from the cities. Below is presented the table of expenses in the Aol with the average expenses per each voice.

Table 12: Average monthly expenses in the Aol according to Survey (euros)

| Expenses | Mean | Minimum | Maximum |
|--|--------|---------|---------|
| Food | 118.83 | 10 | 400 |
| Housing | 50 | 50 | 50 |
| Education | 61.36 | 5 | 200 |
| Utilities (water, energy, telephone, etc.) | 46.98 | 10 | 500 |
| Health | 33.42 | 5 | 150 |
| Business | 10 | 10 | 10 |

| Expenses | Mean | Minimum | Maximum |
|-------------|-------|---------|---------|
| Agriculture | 40.38 | 10 | 100 |

6.6.4 Component sensitivity

According to the baseline information collected, households in the Aol have average incomes that are lower than the national average. Unemployment levels are relatively high and the private sector plays a marginal role in the local economy, while income generally derives from the public sector and from retirement pensions. Farming is important in the livelihood of households however it generates a source of income only in a limited number of cases.

Based on the considerations above, the sensitivity of the economy, employment and livelihood component is considered to be Medium both for the WF and OHL Aol.

6.7 Education

6.7.1 Education facilities in the Aol

Access to education in the Aol is relatively good and close to the national average. According to state policies, elementary and secondary education is mandatory, therefore these kind of schools are generally found even in smaller residential areas. As indicated in the table below, all villages in the Aol have an elementary and secondary school, except the villages of Tërstenë and Gumnishtë. The village of Banjskë which has only the elementary school for the Serbian community. No high schools are present in the Aol, the closest high schools are located in the cities of Mitrovicë and Vushtrri, as further described below. The means of transport to reach elementary and secondary schools are either by school buses or public transports. The schools, where present, are usually situated in the centre of the villages together with the Healthcare Centres, if not in the same yard as in Rshan, Bajgorë and Kaçandoll.

Table 13: Education facilities in the Aol

| Municipality | Village | Elementary School | Secondary School | Transport provided for students |
|------------------|-----------|-------------------|------------------|--------------------------------------|
| Mitrovicë | Bajgorë | Yes | Yes | Public transport |
| | Bare | Yes | Yes | Public transport |
| | Kaçandoll | Yes | Yes | Public transport |
| | Stan-Tërg | Yes | Yes | Public transport |
| | Rashan | Yes | Yes | Public transport |
| | Tërstenë | No | No | School bus or public transport |
| Vushtrri | Gumnishtë | No | No | No (There are no kids in school age) |

| Municipality | Village | Elementary School | Secondary School | Transport provided for students |
|--------------|-----------------------|---------------------------------|------------------|---------------------------------|
| | Pasomë | Yes | Yes | School bus or public transport |
| | Sllatinë (Gjelbishtë) | Yes | Yes | Public transport |
| | Banjskë | Yes (for the Serbian Community) | No | School bus or public transport |
| | Dobërlukë | Yes | Yes | School bus or public transport |
| | Vushtrri | Yes | Yes | |

The village of Banjskë, a village near the city of Vushtrri, does not have a school but is located very close to the school of the village of Smrekonicë (approx. 10 minutes). However, the Head of the Village and the residents noted that the need for a school was becoming more urgent given the constant growth of the population as a result of it being located near the national road and the city of Vushtrri.

The other village that does not have its own school is the village of Gumnishtë. This is due to the very low number of people living in the village, only three families, and consequently, with the lack of pupils to justify a teacher/teachers for this village. The building of the school has been renewed after the war of 1999, but the continuous emigration has made the local and central authorities deploy resources to other communities.

The Serb Community in Banjske has its own school, but the school is going towards closure due to the lack of pupils in this community. There are only 5 of them at the moment. The schools and health care centres for the Serb communities in Kosovo are run directly from the Government of Serbia and the local government of Kosovo has no data on the employees in these structures.

Generally, villages in the OHL AoI have easier access to education facilities than villages in the WF AoI, due to the vicinity to the city of Vushtrri, where main education facilities are present.

The closest University is located in the city of Mitrovicë, which is approx. 40 minutes by car from the AoI. Also other educational institutions as kindergarten and high school are located in the city of Mitrovicë. Nevertheless, the only more accessible institution is elementary and secondary schools, with an average time distance of 18 minutes. The tables below summarize the time generally needed to access education facilities from the WF and OHL AoI by public transport.

Table 14: Distance in minutes from the education facilities in the WF AoI by public transport

| | Minimum | Maximum | Mean |
|--|---------|---------|-----------|
| Kindergarten | 20 | 60 | 40 |
| Elementary and secondary school | 5 | 30 | 18 |

| | Minimum | Maximum | Mean |
|--------------------|---------|---------|-----------|
| High school | 20 | 60 | 40 |
| University | 20 | 60 | 40 |

Table 15: Distance in minutes from education facilities in the OHL Aol by public transport

| | Minimum | Maximum | Mean |
|--|---------|---------|-----------|
| Kindergarten | 5 | 40 | 18 |
| Elementary and secondary school | 5 | 30 | 10 |
| High school | 5 | 40 | 18 |
| University | 5 | 45 | 26 |

Main problems with educational institutions and what the residents would like to improve are distance and teaching material. Transport to and from schools is problematic, particularly for the kindergarten, high school and University which are located in the city of Mitrovicë and of Vushtrri.

Most of the schools in the Aol are covered by the public transport, which however was presented by a part of the respondents as problematic due to the fact that the families have to pay for the transport. Sometimes minivans are used to transport children to private schools and colleges that are starting to open in the cities. Usually they are used by families residing near the cities and during our survey, only one family reported that their child goes to the private school.

Also the general maintenance levels of school buildings (heating, electricity, etc.) is considered problematic. Kindergartens are not very widespread in Kosovo due to the fact that usually the kids, until the age of school (6 Years) are growing up with their grandparents or mothers if they are housewives. Kindergartens are found only in larger cities, there is one Vushtrri and one in Mitrovicë. The following main critical issues on education facilities emerged during the surveys.

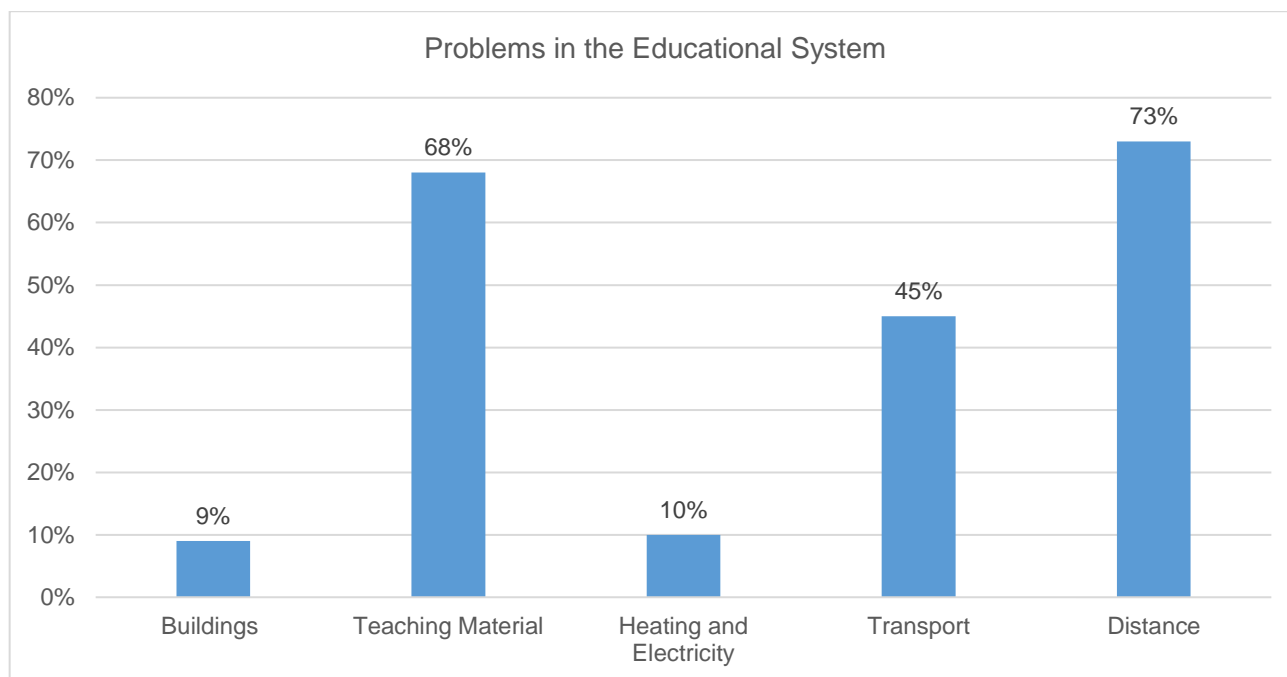


Figure 12: Reported Issues in Education System in the Aol according to the Survey

As showed in the maps in the following paragraphs, in many villages schools are located near the main road which potentially will be used for machinery transportation during the project construction in the WF Area. Thus, a detailed transport management plan needs to be implemented and information meetings should be conducted with community (as described in Chapter 8). This means a description and detailed schedule for all the movements during the traffic peak. The schools that are more likely to be impacted by traffic activities are indicated below.

School in Bare Village

As shown in the map below the school of Bare is approximately 50 m from the main road that potentially will be used for the machinery transportation.



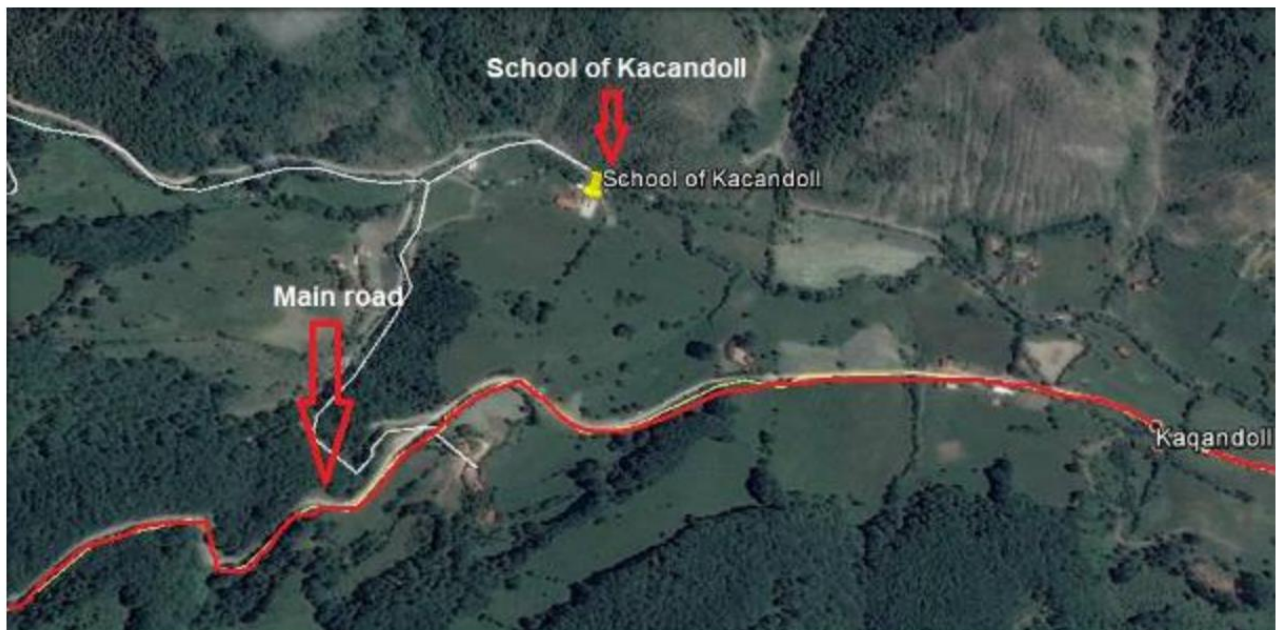
School of Bajgorë

As shown in the map below the school of Bare is approximately 20 m from the main road that potentially will be used for the machinery transportation.



School of Kaçandoll

As shown in the map below the school of Kaçandoll is relatively far from the main road but anyhow they need to be aware for the transportation if the machineries will pass through this road.



6.7.2 Education levels in the Aol

The level of education of the residents in the area is close to the average national level, with very few illiterate people, although a small number of respondents still declared that they know how to write and read, but have not completed their elementary education. On the other hand, the number of women who continue their studies after middle school is much lower than that for men in the area, although there is a tendency for these levels to get even after the war in 1999, since the number of women following high school is constantly increasing.

Table 16: Highest level of education obtained by respondents in the Aol according to Survey

| Education level | Male | Female |
|---------------------------------|------|--------|
| Primary (4 years) | 3 | 36 |
| Middle School (9 years) | 45 | 85 |
| High School (12 years) | 98 | 81 |
| Technical | 26 | 7 |
| Higher (University / institute) | 43 | 9 |
| None (primary not completed) | 5 | 2 |

The educational situation in these villages has effects on the overall employment and economic status of people. The majority of the main income providers interviewed have graduated only from high school and in a few cases from technical schools. On the other hand, women in fewer cases have graduated from university; as indicated in the table above, only 9 women have graduated from university, versus 43 men who have university degrees.

According to FGDs with women and KII, there is a tendency in recent years for women to complete university studies in similar numbers to men. This is a tendency that in the rural areas has still to reach the same levels as in the cities, but the trends are changing, albeit slowly.

6.7.1 Component sensitivity

According to the baseline information collected, access to primary and secondary schools is generally good in the Aol, thanks to the presence of schools in most villages and transport systems for students. High schools and universities are not present in the Aol, which means that access to higher education is more difficult and this has effects on the overall education levels of the population.

Based on the considerations above, the sensitivity of the education component is considered to be Medium-Low both for the WF and OHL Aol.

6.8 Transportation and Traffic

Although the Highways National Roads are usually very modern in Kosovo and safe, in the Aol the situation differs significantly. The National Road that connects Pristina to Vushtrri and Mitrovicë is very old and with very high traffic during peak hours. It is also often a cause for accidents, and it has not been improved for several years. The road that leads from Mitrovicë to Bajgorë and its surroundings is very rundown due to a lack of maintenance in an area of very cold winters with frequent snow, the road conditions continue to deteriorate every year. The residents have indicated that the road quality is one of the biggest issues for their community.

This road will be used for the transportation of Project material during the construction phase. The road goes through the villages of Stan-Tërg, Bare and Bajgorë (as reported in the map below), that will hence be particularly impacted by traffic during the construction phase.

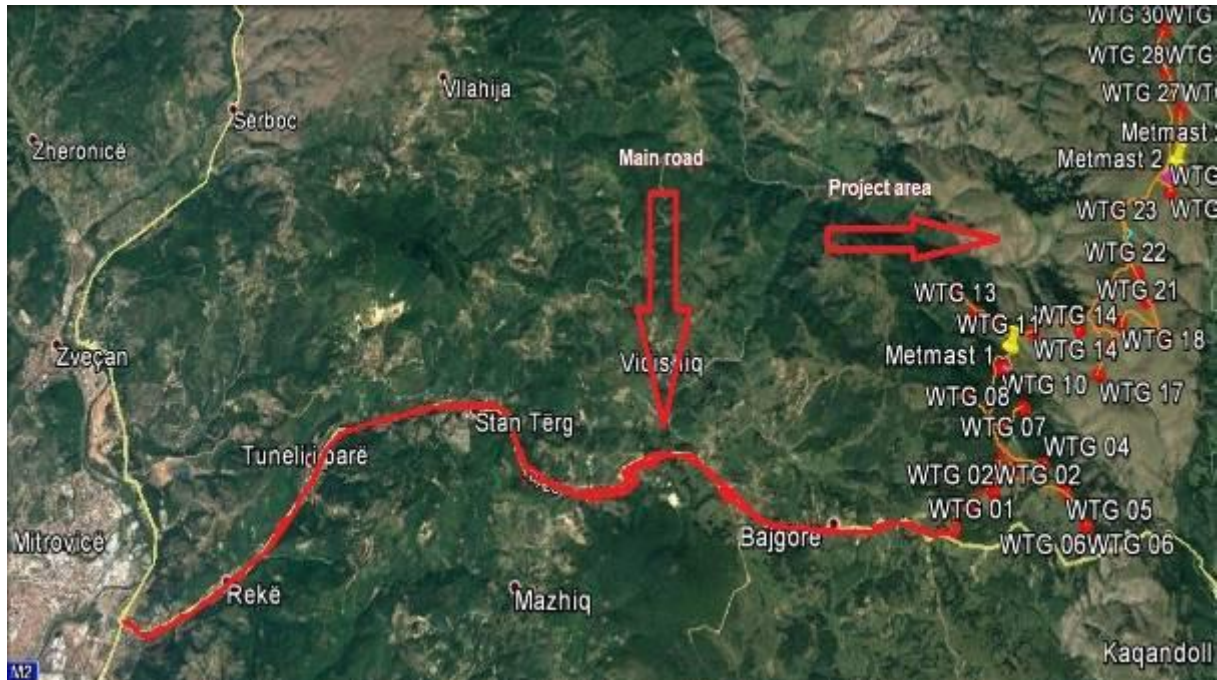


Figure 13: Road that will be used for the transportation of Project material during the construction phase

Particularly difficult is the situation in the village of Gumnishte, where the paved road has been laid up to the first houses of the village near the secondary road that connects it to Bajgorë, while the other roads are unpaved and, during the winter, the residents have on many occasions remained isolated due to very cold winters and heavy snow that blocked their communication to other villages and cities.

The traffic in these rural areas is almost totally absent, except for the residents and small trucks, vans and sometimes buses for public transportation. The public transport transits usually 2 times a day, except for the village of Banjske, which is a village next to the city, in which transits 4 times a day. As previously indicated, there are also school buses that pick up children to and from school. This is done through private transporting companies, which receive a monthly compensation for this service.

The roads are very narrow and the drivers have to be very careful not to drive fast, because the interchange between two cars in certain parts is difficult, especially in the winter, when sometimes the road becomes even narrower because of the presence of snow and ice, which in these areas melts very late in the spring.



Figure 14: Unpaved Road in Gumnishte



Figure 15: Paved Road from Pasome to Basnjske



Figure 16: Lane Blocked - Road from Bajgorë to Gumnishte, April 2019

Main problems faced with transportation are the cost for private car maintenance, which is often relevant due to the bad conditions of the roads in the remote areas. The costs of maintenance and the cost of gasoline, which has a high price not only for the area, but for Kosovo generally (nearly 1.2 Euro/litre) was an issue for 37% of the respondents, while 53% mentioned the road infrastructure as a problem in the Aol. Other problems are the availability of the public transport (9%) and the frequency of the bus lines (1%).

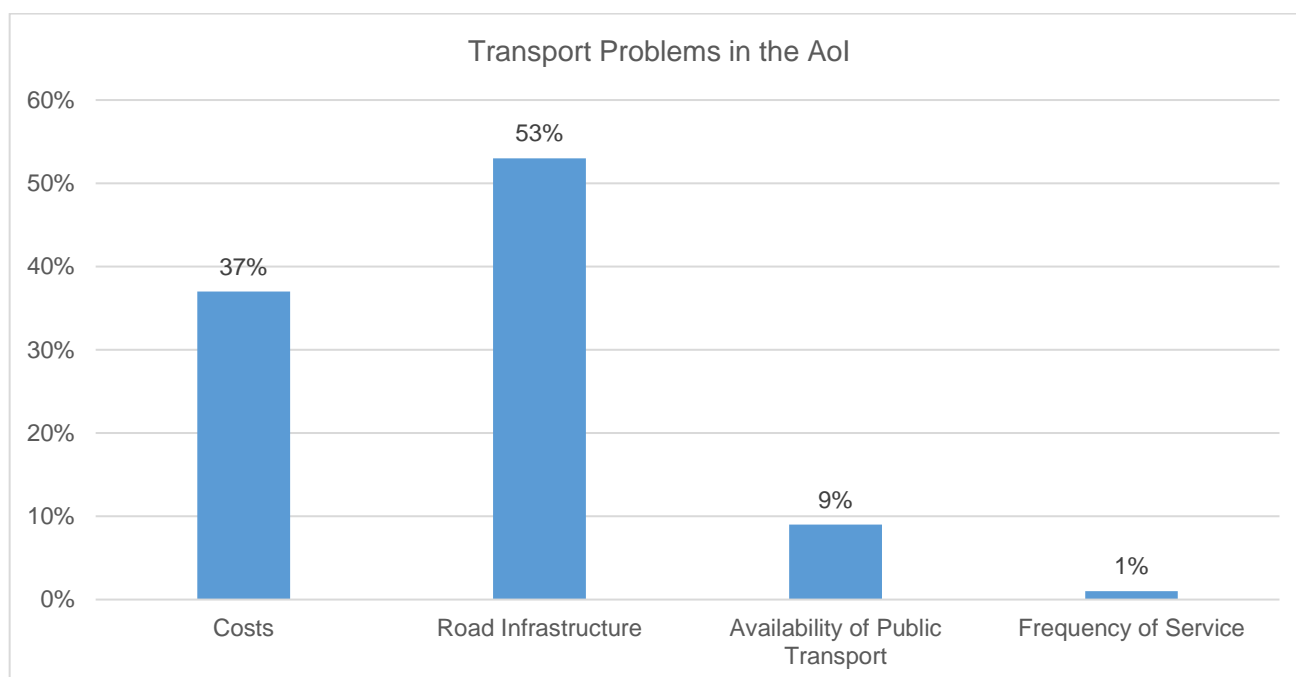


Figure 17 Reported transport issues in the Aol according to Survey

6.8.1 Component sensitivity

According to the baseline information collected, road infrastructures in the Aol are poor due to lack of maintenance and unfavourable weather conditions. Access to public transport is limited and the cost of having and maintaining private cars is considered significant within the overall livelihood levels of households.

Based on the considerations above, the sensitivity of the transportation and traffic component is considered to be Medium-High both for the WF and OHL Aol.

6.9 Housing and Infrastructures

6.9.1 Housing

The majority of the houses in the Aol are newly built, except for the village of Banjskë.

This is due to the area being a theatre of serious fighting between the former Yugoslav Army and UCK (Kosovo Liberation Army) between 1998 and 1999 when all the houses were burnt down or bombed by the Yugoslav Army. The village of Banjskë had a mixed population of Serbs and Albanians and it was saved from destruction due to an informal agreement that these two communities reached during the peak of the fighting. The houses of all these villages were built anew and so were the schools and Healthcare Centres.

6.9.2 Sources of Energy

The Aol is characterized by cold dry winters and heating of homes is therefore essential from autumn all the way to spring. When asked about the main source of energy used, respondents mentioned electric energy and wood. The main source of energy for heating is wood and charcoal. Likewise, in most households cooking is usually done using wood and charcoal; some households also have electric stoves, however problems in energy distribution leads most of the households to use wood stoves. Electric energy is used for lighting in all households.

Although it is the main source of energy, wood is usually obtained in the nearest forest. Even if the respondents did not mention this, a part of it might come from illegal tree cutting. This is indeed a very common practice in the entire country. Only 1% of the respondents reported that they buy their wood.

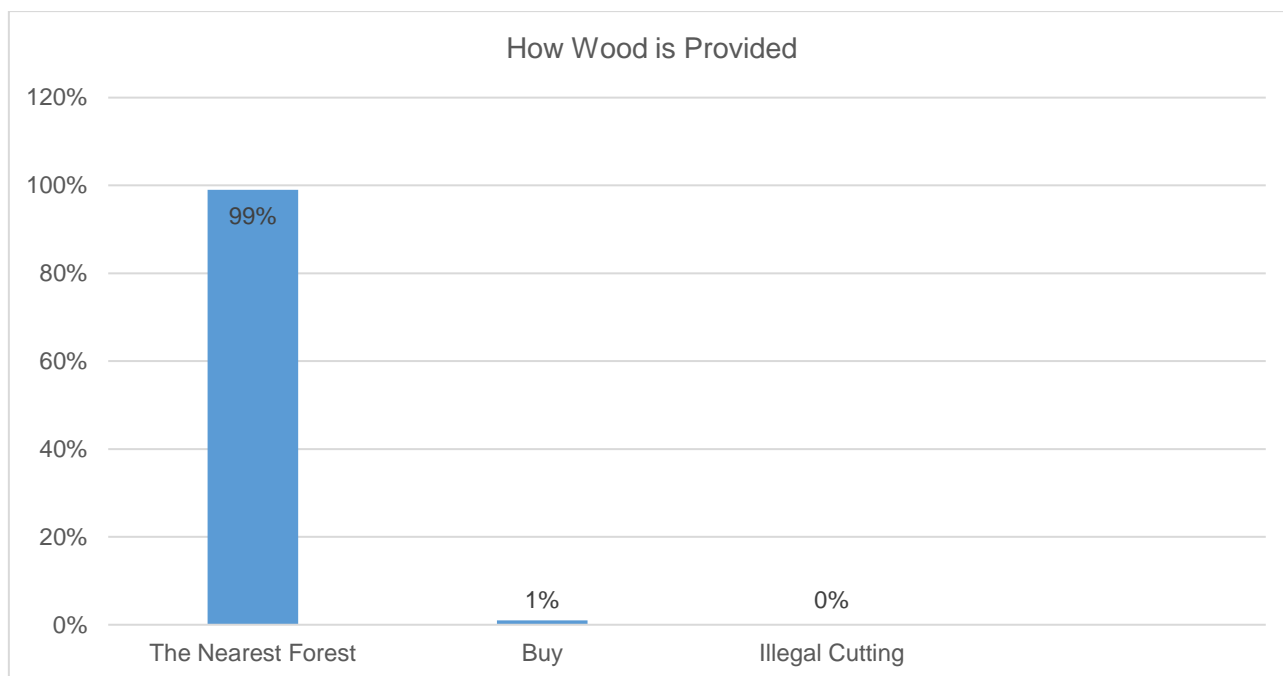


Figure 18: Wood provision in the Aol according to Survey

All households, even remote ones, have access to electricity. The electricity supply seems to have a lot of cut-offs, especially during winter, when the bad weather and the snow mixed with ice, weighs down onto a system which is very obsolete. Although there have been some investments to improve the current system, a lot of

issues remain with the electrical supply and with the general need to increase the energy supply, not only in the big cities and industrial areas, but also in the more rural and remote zones.

All the residents in the villages far from the nearest cities, complained about the energy system, the frequent cut-offs and the need to rely more on electricity for their everyday needs, but also for the small activities serving in the area, who cannot invest in generators, because of the low incomes of their activities.

Natural gas is not used as a source of energy in the AoI, as there are no gas networks in Kosovo.

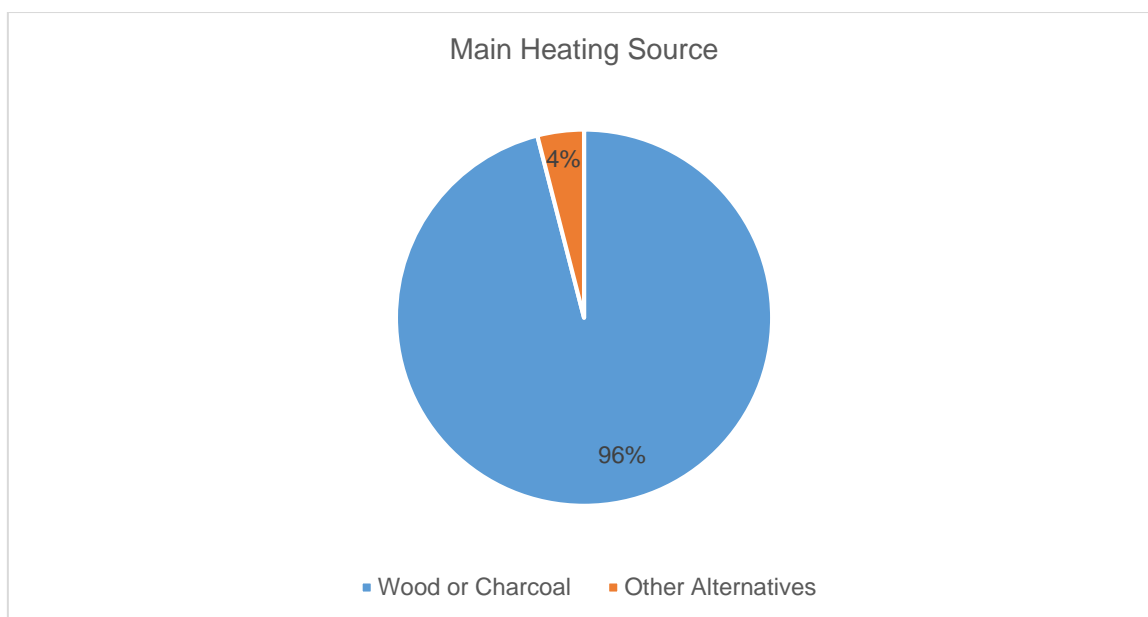


Figure 19: Heating sources in the AoI according to Survey

6.9.3 Water supply

The potable water distribution system does not cover the entire AoI and no investments in extending the water distribution system seem to be planned. However, the Area seems to be generally abundant in water sources, therefore access to water does not seem to represent a problem for households.

With regards to the OHL AoI, only 42% of the families get the water from the water distribution system, while 22.3% get the water for their family needs through private water wells and 35% of the families satisfy their water supply needs directly from natural water springs.

The residents of the village of Pasomë and their Head of the Village complained that even if they have the water distribution system, the water has a high level of dissolved limestone. They reported that they do not drink the water from the distribution system and they get it from the area of Bajgorë, which is well-known for the good quality of its mineral water sources. The area between Bare, Bajgorë and Kaçandoll is rich in water streams and water sources that are used not only by residents of this area but also from residents of other villages or cities, who reach the area to fill small water tanks for personal consumption in their houses.

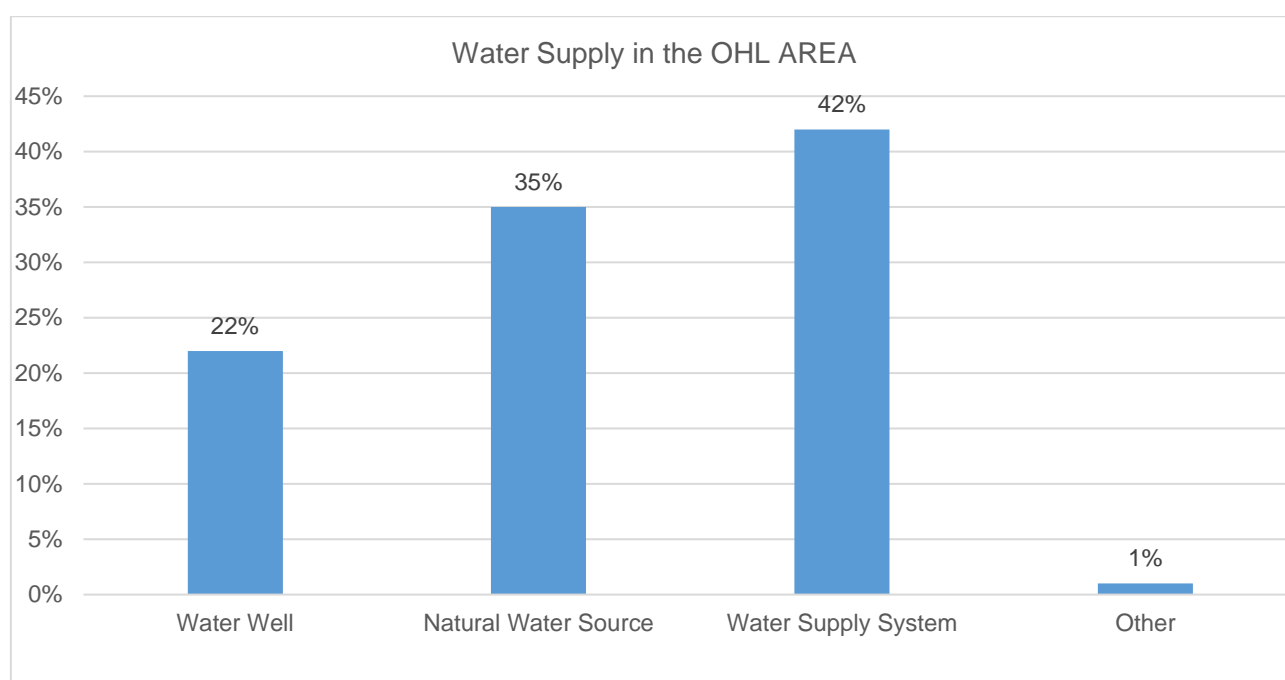


Figure 20: Water supply for the OHL Aol according to Survey

In the rest of the OHL villages, regardless of the water source, quality is perceived to be generally good. Only 9% of the survey respondents in the OHL Aol say that the water quality is very bad and 26% report the water quality to be bad, while 45% report a good water quality and 20% a very good water quality.

With regards to the WF Aol, the water distribution system is not present in most of the households, as only 4% of households are connected to the water distribution system (only the village of Stan-Tërg is connected to the network). The majority of the households (48%) takes water from springs and 35% from water wells, while 13% is getting water from both springs and wells.

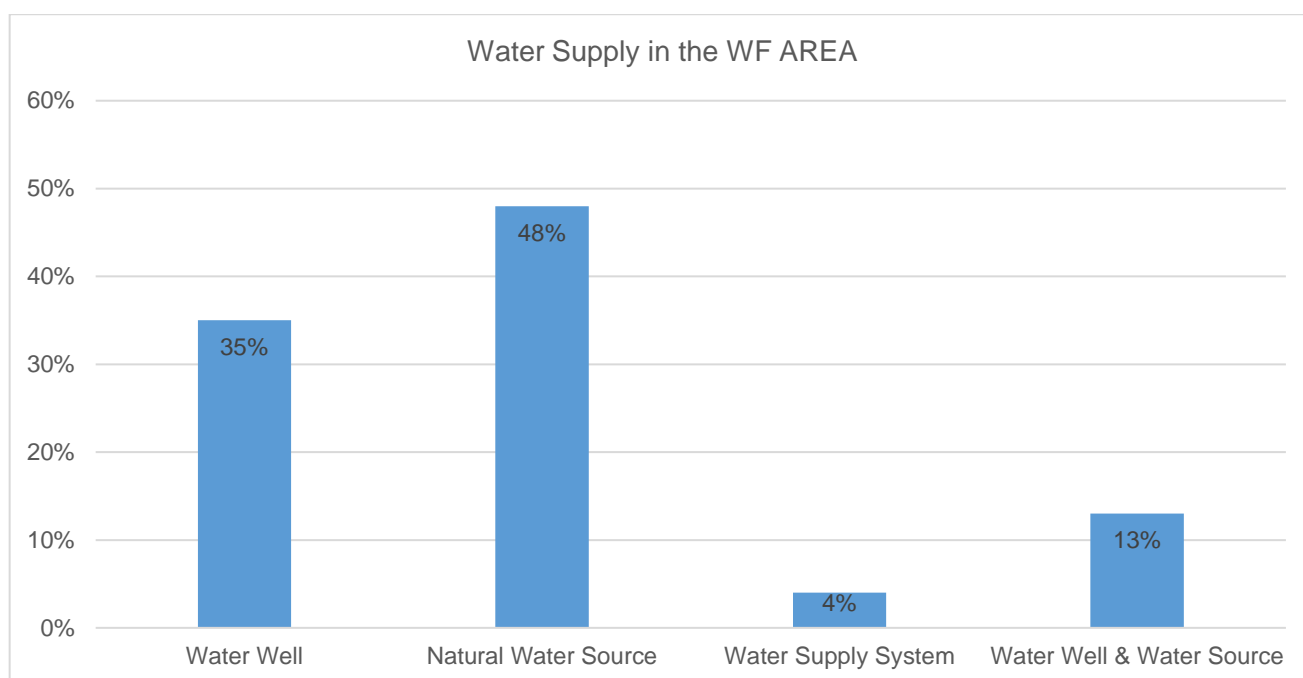


Figure 21: Water supply in the WF Aol according to Survey

As for quality, water is considered to be good and very good in 99% of the households, while 1% reports to have a bad water quality either in the system or in their wells.

Water used for human consumption is used also for livestock. The use of water for irrigation of fields is described in section 6.10.3.

6.9.4 Telecommunication infrastructure

The Aol is not well connected in terms of the telecommunication services. Landline connections are available only in the areas near the city of Vushtrri (Banjske and Doberlluke). The rest of the Aol has to rely on mobile connections; in particular there is only one telecom antenna in the Aol which provides internet through the 3G/4G technology. This antenna is located close to the future WTG 07, as indicated in the figure below. No other means of telecommunication are present in the Aol.

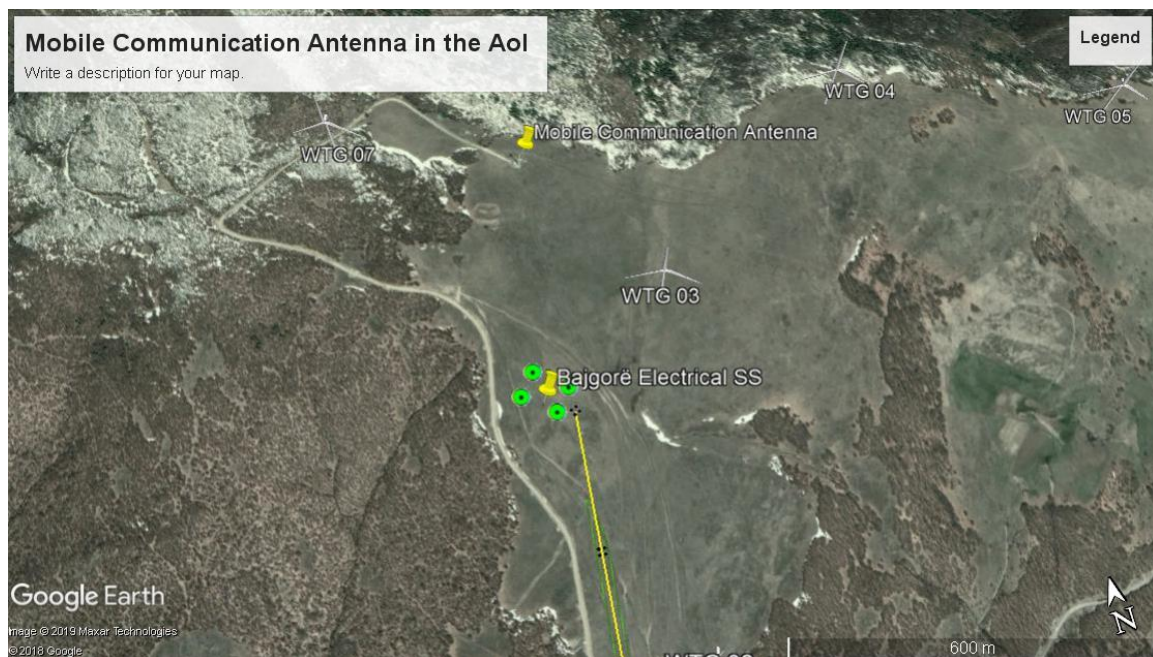


Figure 22: Location of the mobile communication antenna in the Aol

6.9.5 Sewage System

Due to geographic conditions of the Aol and low density of houses, sewage systems are not present in most of the Aol. Only the villages close to the city of Vushtrri (Banjske, Sllatine and Doberlluke) are partially connected to a sewage network. However, in many cases also in these villages, houses are not connected to the network because they are built in agricultural areas not destined to construction, where the sewage network has not been developed.

Houses that are not connected to sewage networks usually use septic tanks for the treatment and discharge of wastewater.

6.9.6 Component sensitivity

According to the baseline information collected, housing conditions do not seem to show significant problems. Access to infrastructures is generally good. Main problems are linked to electric energy distribution, which often faces cut-offs and the dependency on households on wood for the heating of houses.

Based on the considerations above, the sensitivity of the housing and infrastructures component is considered to be Medium both for the WF and OHL Aol.

6.10 Land use and ownership

6.10.1 Land use

Due to the extension of the Aol, particularly of the OHL Aol, many different land uses can be found.

The land necessary for the WF, including the access roads is estimated to be 16.04 Ha comprising both private and state land parcels with 65 affected private owners.

For the implementation of the OHL 9.6 Ha are going to be purchased for the installation of the electric towers and the implementation of the Bajgorë Electric Substation, of which 6 Ha affect private properties and 3.6 Ha are purchased from state land properties.

The area of Easement for the implementation of the OHL affects 22 Ha of private land and 6 Ha of state land. 259 owners and Households are affected directly by even purchase or easement necessary for the implementation of the OHL.

The land use in the WF area is mostly for grazing and pastures, while a part of it is for forestry, although forested areas will not be directly affected by the Project.

There is a part of forest affected by the implementation of the OHL, especially in the villages of Gumnishtë, Pasomë, Rashan and Tërstenë. In the area near the city of Vushtrri, in the villages of Sllatinë, Banjskë, Dobërlukë and Vushtrri, the implementation affects the most cultivated land.

The majority of affected parcels, 68.9%, are used for a combined purpose of housing and agriculture, while the rest are used for wood harvesting, housing only or agriculture only.

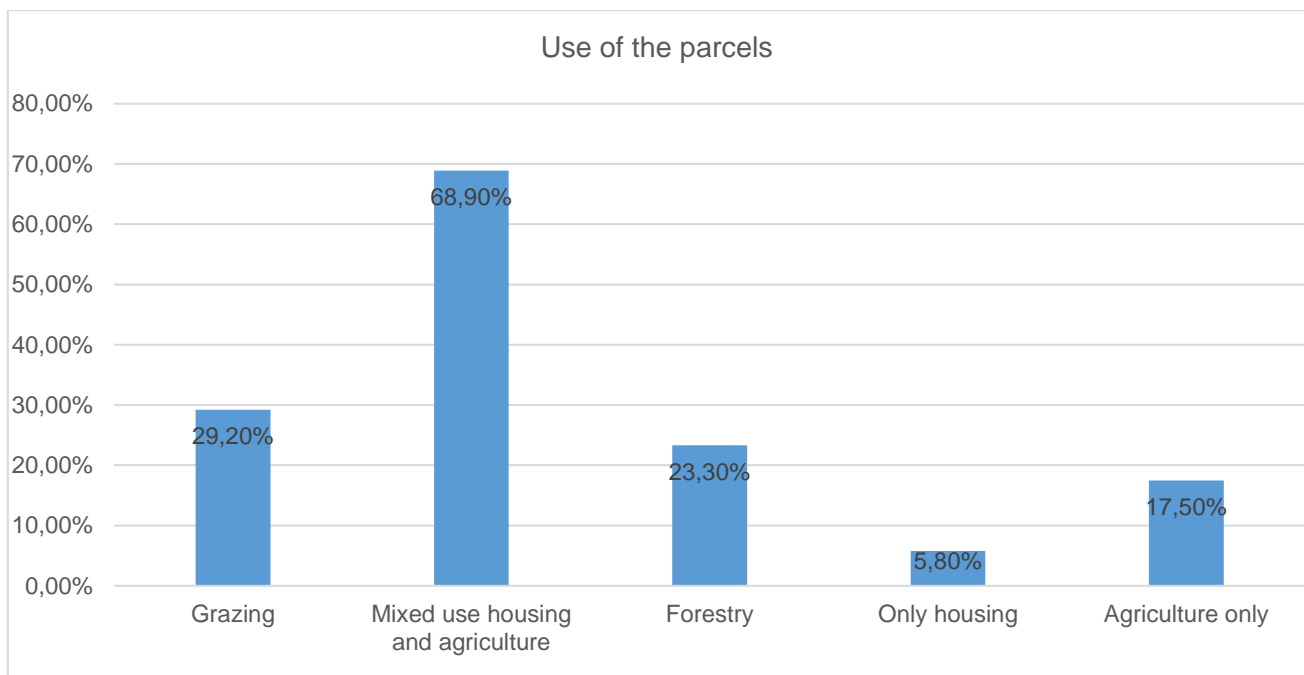


Figure 23: Land use for the parcels in the Aol according to Survey

6.10.2 Land Ownership

As shown in the graph below the majority of the households in the WF Aol owns a land plot (91 %).

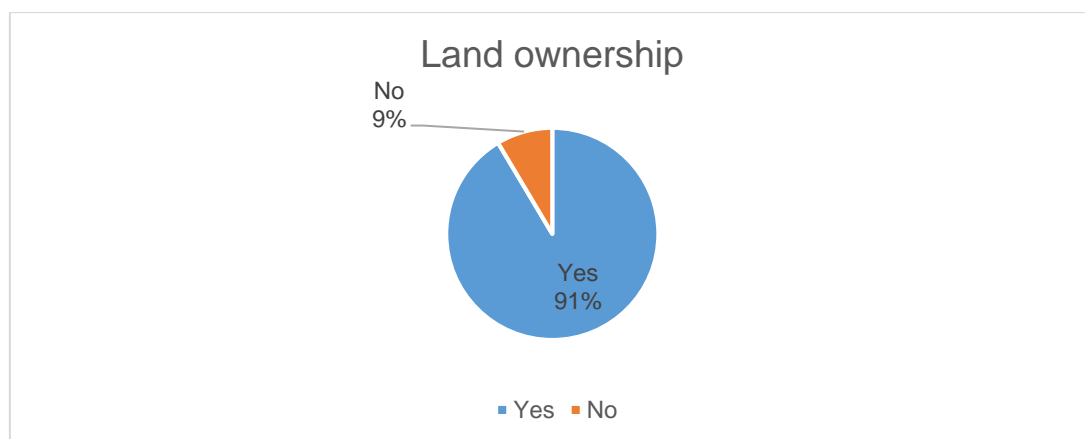


Figure 24: Land ownership in the WF Aol according to Survey

The respondents who do not own land are mainly located in the settlement of Stan–Tërg which relied exclusively on the Trepca mine for employment and was made up of workers from other areas of Kosovo who moved to the area to work in the mine.

The size of land owned by households in these villages varies from 0.2 to 20 Ha. The majority of the respondents own from 2 Ha to more than 5 Ha (36.45%). Other families possess 0-1 Ha (27.10%) and 1 - 2 Ha (17.76%) and (18.69 %) families possess more than 5 Ha.

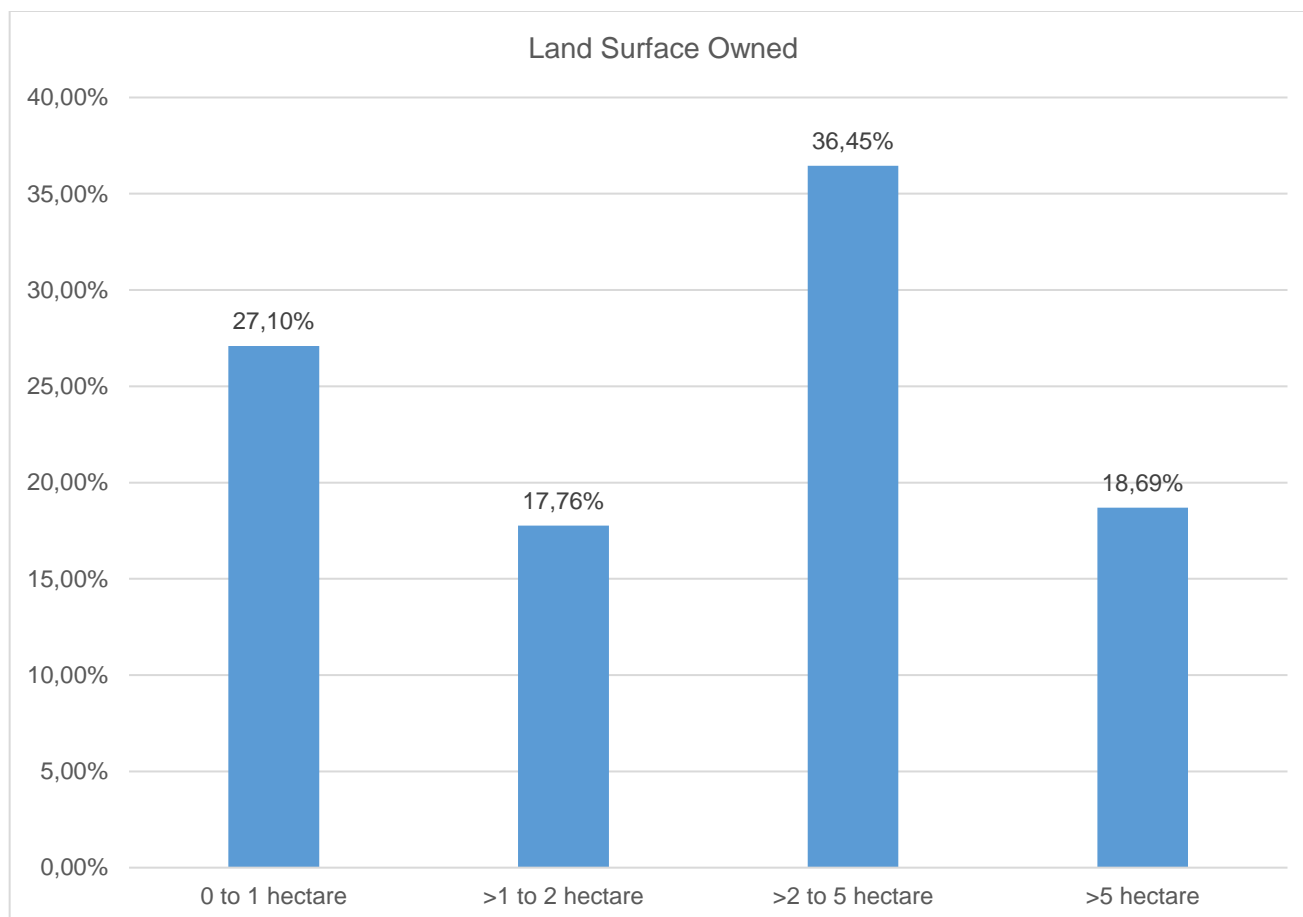


Figure 25: Land Ownership in the WF Aol according to Survey

With regards to the OHL Aol, the size of the land owned in the OHL Aol starts from 0.1 Ha to 15 Ha with an average of 1.87 Ha of land owned. The relative majority of the respondents, 34% owns up to 1 Ha, while 29% owns 1-2 Ha and 28% 2-5 Ha, and 9% of the owns more than 5 Ha.

Most of the respondents in the OHL Aol possess legal documents for their parcels, making them the legal and full owners. Even the families that do not have all legally required documents have partial documentation proving that the land belongs to that family.

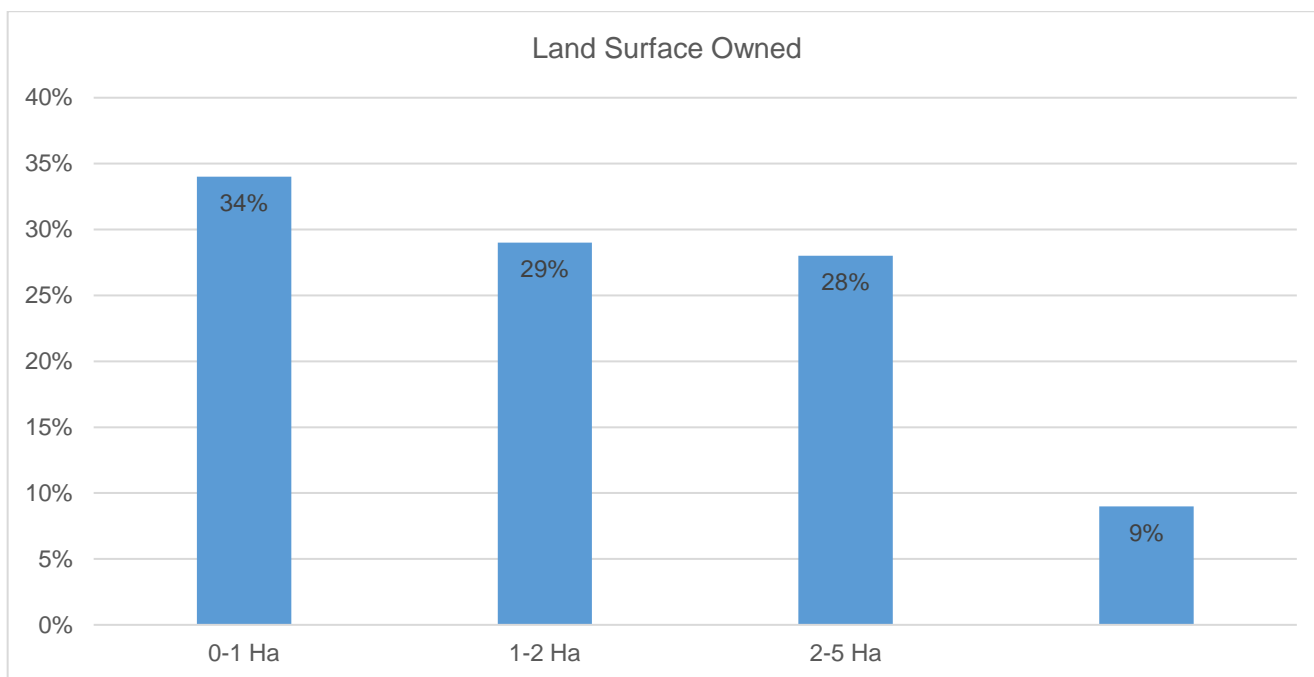


Figure 26: Land Ownership in the OHL Aol according to Survey

There are also Serb owners of the parcels affected by the implementation of the OHL. Even if some of them are still resident, mostly in the village of Banjskë, there are some owners that do not live in Kosovo anymore, due to the situation created after the war in 1999. Especially in the village of Sllatinë, where there is no Serb community anymore, the parcels owned by the Serbs have been sold to Albanians without any proper legal document in front of the notary or are being used by the residents. The same situation exists in the village of Banjskë.

Land renting or leasing in the Aol is not unusual, although land is leased to family members without any compensation. Depending on the agricultural activity of the lessee, usually this one compensates in nature the leaser. This is a common practice in Albania and Kosovo due to the high number of immigrants and to the fact that they prefer to lease the land to family members. These leases are therefore usually managed informally and not officially registered.

6.10.3 Irrigation

The situation for irrigation of the fields differs within the Aol.

The fields of the villages of Dobërllukë, Sllatinë, Banjskë and Vushtrri in the OHL Aol have irrigation and drainage systems built when Kosovo was part of the former Yugoslavia (Iber-Lepenc channel). Not 100% of the irrigation and drainage system is still working, as declared by the residents, since there is some lack of maintenance from the Vushtrri Municipality, but it is functional and largely used by the farmers.

This has brought this area to be very fertile and massively farmed, differently from the other villages, in which the predominance is still that of a mountainous and hilly areas and the field areas are very limited due to the terrain.

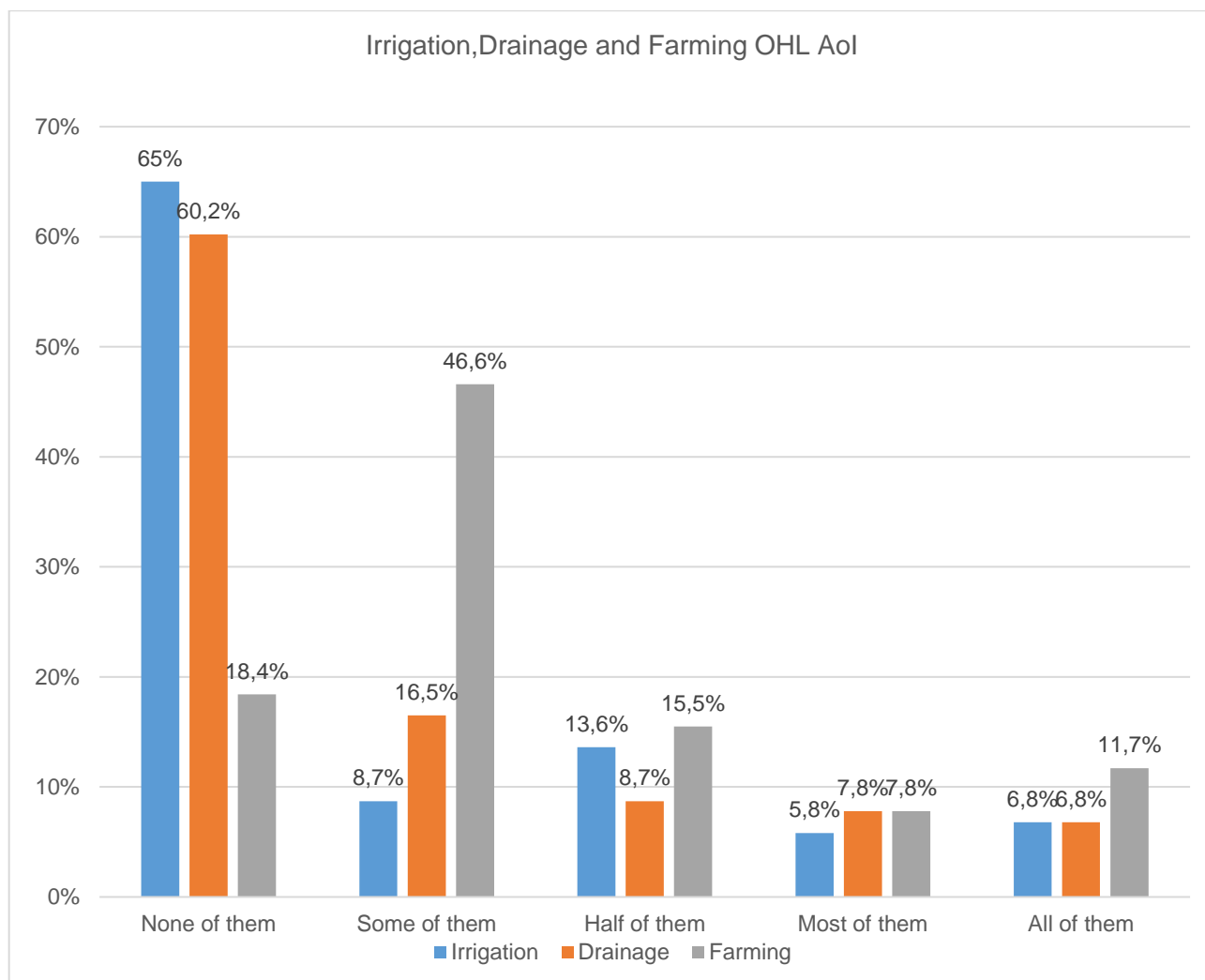


Figure 27 Irrigation, drainage and farming of the land in the OHL Aol according to Survey

Irrigation and drainage in the WF Aol is almost totally absent, due to predominance of a mountainous area. The parcels irrigated in this area are done privately by the land owners and are usually limited to the areas that are predominantly in field, near their houses. Also, the quantity of the land farmed differs from that of the OHL Aol, due to climate and the aforementioned reasons.

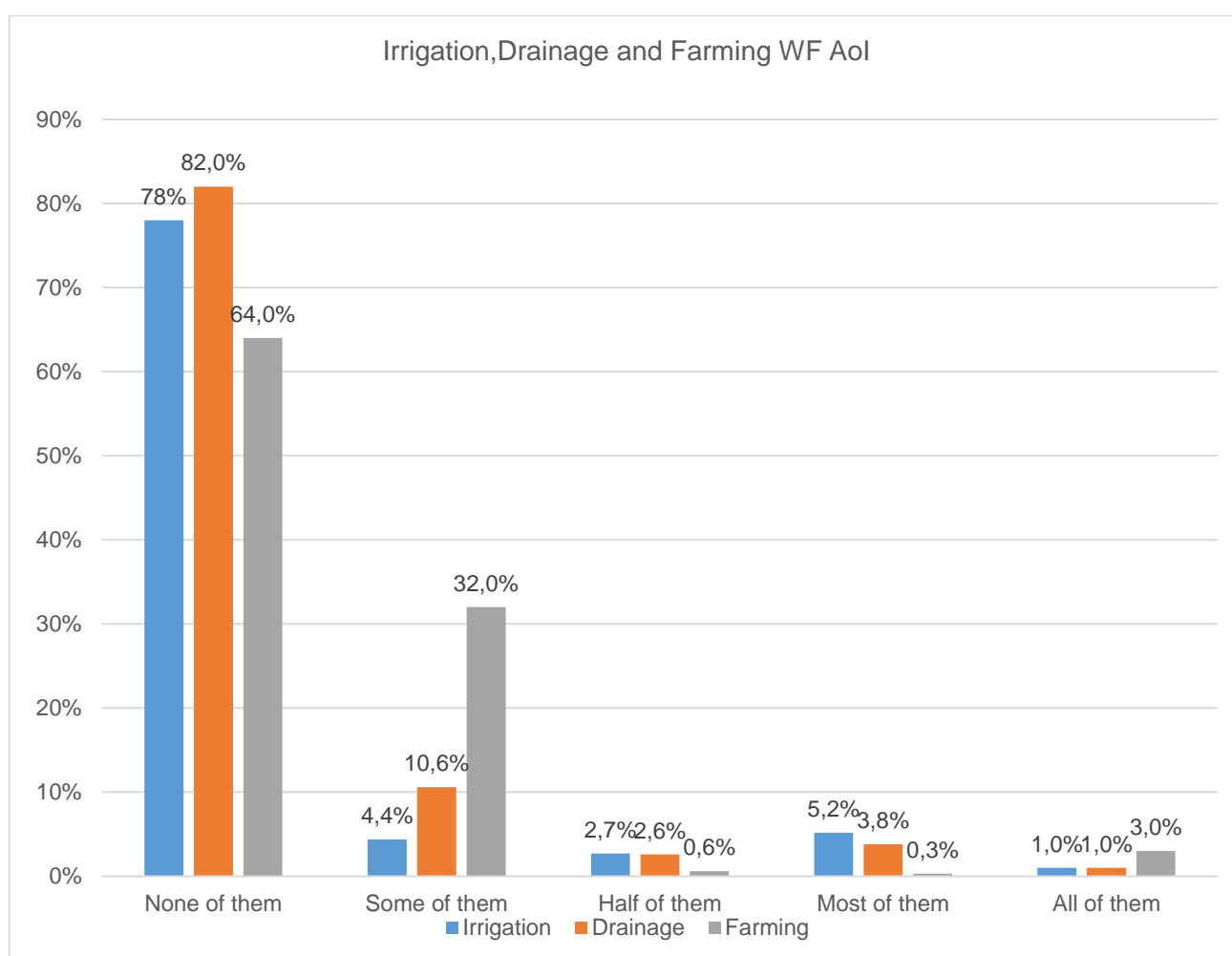


Figure 28 Irrigation, drainage and farming of the land in the WF AoI according to Survey

6.10.4 Component sensitivity

According to the baseline information collected, land plays a more relevant role in the livelihood of households in the OHL AoI, due to more developed farming activities, while in the WF AoI farming is more limited and land is mainly used for pasture activities.

Based on the considerations above, the sensitivity of the land use and ownership component Medium-Low for the WF AoI and Medium for the OHL AoI.

6.11 Community Health and Safety

6.11.1 Healthcare facilities

Access to health services is in general satisfactory. The majority of the families can access healthcare centres in 5 to 10 minutes by car or public transport. The table below indicates which healthcare facilities are present in the AoI. Due to the fact that in Kosovo the number of doctors is limited, the Healthcare System together with the Municipalities, in order to cover all villages, uses the same doctor to cover more than one village. The Healthcare Centres, where present, always have a nurse for consultations and services that do not require a doctor, otherwise the doctors are always available through phone calls. Hospitals are present in both cities of Mitrovicë and Vushtrri.

Table 17: Healthcare facilities in the Aol

| Municipality | Village | Healthcare Centre | Doctor |
|--------------|-----------------------|---|---|
| Mitrovicë | Bajgorë | Yes | Yes (Once a week) |
| | Bare | Yes | Yes (Permanent) |
| | Kaçandoll | Yes | Yes (Twice a week) |
| | Stan-Tërg | Yes | Yes (Permanent) |
| | Rashan | Yes | Yes (Twice a week) |
| | Tërstenë | No (the Healthcare Centre of Rashan is used by the residents) | |
| Vushtrri | Gumnishtë | No | |
| | Pasomë | Yes | Yes (Twice a week) |
| | Sllatinë (Gjelbishtë) | Yes | Yes (Twice a week) |
| | Banjskë | No (Only the Serbian Community has the Healthcare Centre) | |
| | Dobërlukë | Yes | Yes (Twice a week) |
| | Vushtrri | Yes | Hospital and different Healthcare Centres |

Hospitals are present both in the cities of Mitrovicë and Vushtrri. In particular the villages from Vushtrri to Rashan and Tërstenë usually are served by the new hospital of Vushtrri built in 2017. The villages near Bajgorë, including Gumnishtë, which is under the administration of Vushtrri Municipality, use the hospital of Mitrovicë, which is nearly 40 minutes from the village by car.

The location of the Mitrovicë hospital is shown in the map below (. The distance to the hospital varies from a minimum of 15 minutes from village of Stan-Tërg and to a maximum of 60 minutes from the furthest household

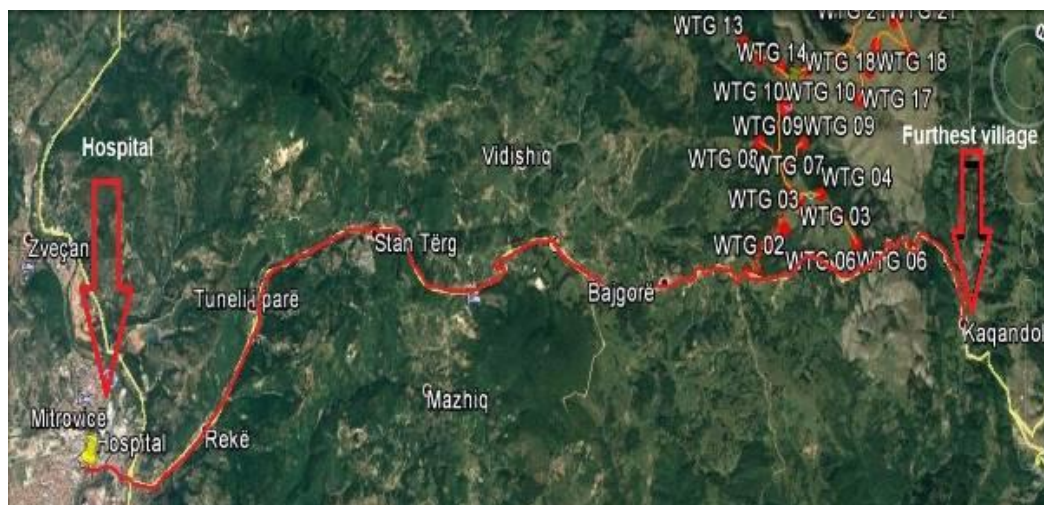


Figure 29: Location of the Mitrovicë hospital

of Kaçandoll village. Stan-Tërg village doesn't have problems of distance because is near to the city of Mitrovicë (10-15 min) while the other villages Bajgorë, Bare and Kaçandoll are even more far as showed in the maps below. Considering this, the average time distance to the hospital is 37 minutes. (Map below)

With regards to the WF AoI, the average time necessary to reach the health facilities by car is reported in the table below:

Table 18: Average distances from Healthcare facilities in the WF AoI

| | Minimum | Maximum | Mean |
|--------------------------|---------|---------|-----------|
| Healthcare centre | 5 | 30 | 9 |
| First aid centre | 5 | 30 | 13 |
| Hospital | 5 | 40 | 19 |
| Doctor | 5 | 40 | 8 |

The Serb community in Banjskë has its own Healthcare Centre with its own doctor and nurse that serves only the Serbs in that village and in the rest of the AoI.



Figure 30: Healthcare centre near villages of Doberlluke - Vushtrri



Figure 31: Healthcare Centre of Pasome Village



Figure 32: Healthcare Centre Banjske – Serb Community

With regards to the OHL Aol, time distance to health services varies based on the household's location. From a minimum of 5 minutes to a maximum of 60 minutes. The average time distance to a health centre for the residents is 27 minutes. Hospitals are even further to an average of 37 minutes.

Ambulances are somehow closer with an average time distance of 17 minutes. Regarding the doctors the average time is 32 minutes because the respondents reported that sometime the doctor was present once a week, so they have to go in nearest village or in Mitrovicë hospital. (See table below). Also it has to be considered that the village is dispersed in neighbourhoods that are far from each other and from the facilities (refer to the maps below).

Table 19: Average distances from Healthcare facilities in the OHL Aol

| | Minimum | Maximum | Mean |
|--------------------------|---------|---------|-----------|
| Healthcare centre | 5 | 50 | 27 |
| First aid centre | 5 | 30 | 17 |
| Hospital | 15 | 60 | 37 |
| Doctor | 5 | 60 | 32 |

Although the services are accessible, the respondents report several issues and problems with the service such as:

- The doctor only comes to the centre once a week;
- The services are in the next largest village.

The health service problems reported by respondents were the equipment (26%) staff quality (56%), the distance (15%) and buildings (3%).

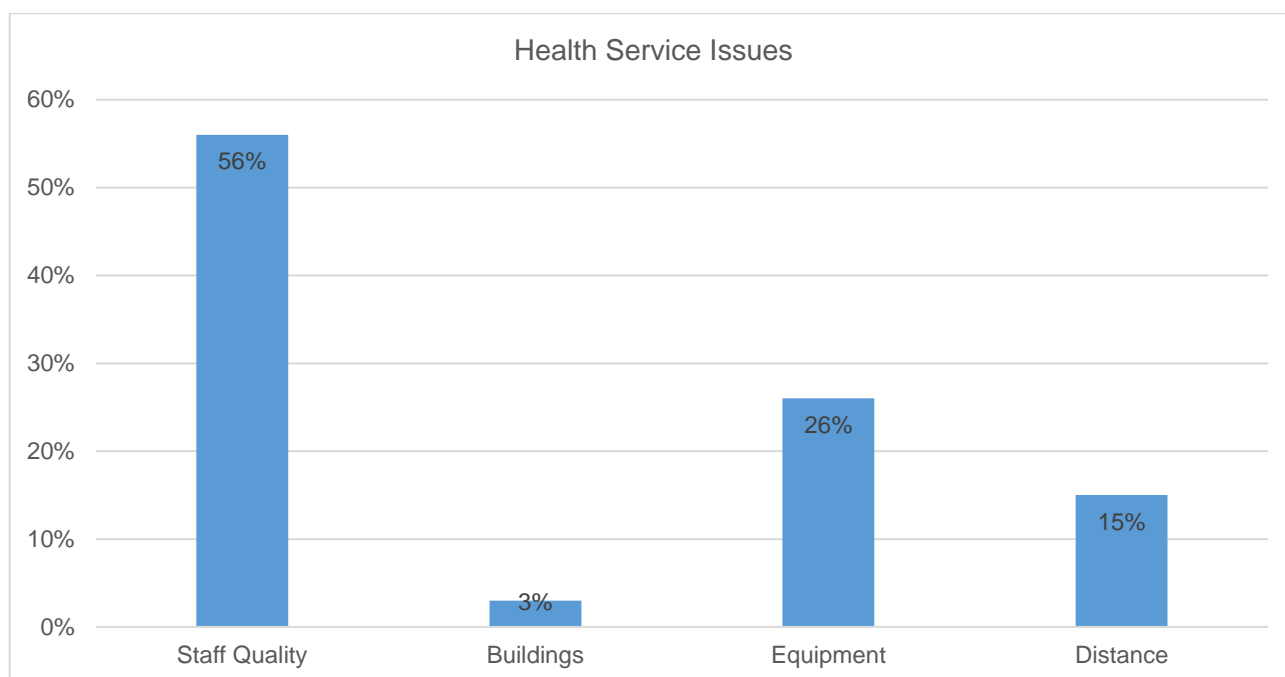


Figure 33: Healthcare issues reported by Survey in the Aol

6.11.2 Outcomes of Key Informant Interviews

Three KII were conducted by the field survey team with the doctors and nurses from the health care centres in the Aol.

The response from the specialists was that in the area the majority of diseases are related to diabetes and hypertension for residents over 50 years of age. The life expectancy at birth is above 70 years of age. The rate of cancerous diseases has increased the past years, but the lack of proper statistics for the area confronted with national data makes impossible to give proper data. The mortality at birth, according to health care specialists, is nearly 0.

The statistics from single villages or villages for a comparison with other periods are impossible to be made, since the Healthcare Centre were burned during the war or are newly built and the statistics here presented are at most from the last 15 years.

The picture created from these interviews is that after the war in 1999 quite a lot has been done towards the improvement of health care for the area and for the buildings that serve as Healthcare Centre.

However, the impression is that much remains to be done in terms of mass prevention, especially in informing the people. Central Government initiatives are totally absent, while NGO's serving in the area have launched some prevention campaigns through the years, but they do not seem to be sufficient. The number of Doctors and nurses in the villages' Healthcare Centre seems to be insufficient and the residents complain about the presence of a doctor per each village or, at least one doctor per each Healthcare Centre present. The facilities in the project Aol, but also in Kosovo generally are newly built. Most of them were built after the war, which means after 1999, but in the Aol they were built between 2008 and 2016. Although the Healthcare Centres are built recently, the quality of instruments and materials, especially in the rural areas, seems to be poor, according to the residents. Some of them are smaller depending on the centrality of the village (e.g. the Healthcare Centre

of Pasomë, even if it is not the biggest village, is bigger than the other Healthcare Centres because of its position).

6.11.3 Component sensitivity

According to the baseline information collected, access to basic healthcare facilities is generally good in the Aol, however more specialized structures are present only in Mitrovicë and Vushtrri.

Based on the considerations above, the sensitivity of the community health and safety component is considered to be Medium both for the WF and OHL Aol.

6.12 Cultural Heritage

6.12.1 Tangible cultural heritage sites

The UNESCO World Heritage sites found in Kosovo are the following:

- Dečani Monastery;
- Patriarchate of Pec Monastery;
- Our Lady of Ljeviš;
- Gračanica Monastery

All these UNESCO sites are Orthodox churches and monasteries; they have been registered as Serb UNESCO sites, due to the fact that Kosovo has not been recognized as an independent country by UNESCO. None of these sites is near the Project Aol.

No officially recognised sites are present within the Aol. According to the Archaeological Institute of Kosovo contacted, there is no pre-identified cultural resource/archaeological site of national or international interest in the Aol. The main historical site found in the Aol is the remains of the Rashan Fortress located 500 m west from the OHL.

In the city of Vushtrri there are different cultural monuments such as the Old Castle of Vushtrri, which was built during the VII Century AD, but was destroyed and reconstructed several times over the centuries. Other cultural sites in Vushtrri are the Old Stone Bridge and the Old Hammam, both built during the Ottoman Empire. All these sites are in the centre of the city of Vushtrri and outside the Aol.

There are some very old Roman Catholic churches in the area of Mitrovicë that pre-date the XV Century, from a time when most Kosovo Albanians were Catholic; they represent the oldest traces of religious-cultural heritage in the area, however they are also located outside the Aol.

Main cultural heritage sites found in the Aol are represented by religious buildings. As noted above, the main religions in the area are Islam for Albanians and Christian Orthodox for the Serbs. Every village in the Aol has its own mosque, which is usually newly built, after 1999, except for the village of Gumnishtë. The village of Banjske has also an Orthodox church that is situated near the Serb part of the village. Near this church, there is also a thermal water source, which has always belonged to the Serb part of the village.

It must be noted that the rural and isolated villages in Kosovo have developed from small neighbourhoods, which usually include a group of houses and their own cemeteries. It is very frequent to see that there are several cemeteries in one village. This tradition is a heritage of past times where families constructed their houses near the agricultural land they owned.



Figure 34: The Orthodox Church and cemetery in Banjske

6.12.1.1 Archaeological sites

Within the Aol there are no records of any ancient settlement mainly due to the high elevation, 1500 m a.s.l, and the distance from main trade routes and other ancient cities of the region. An archaeological baseline survey was organized by the Archaeological Institute of Kosovo (AIK) during 2017 in order to assess the archaeological potential of the site. In the consent issued by this institute it is stated that according to their database and knowledge there are no any objects/sites of archaeological importance in or around the Aol.

Nevertheless, the consent includes a provision for the construction of the wind farm: during soil excavation, if any finding occurs the investor is obliged to stop immediately the works and inform the AIK and the proceeding will be in accordance with the Law on Cultural Heritage Nr.02/L-88 and paragraphs 7.6, 7.8 and 7.9 of the same law.

6.12.2 Intangible cultural heritage

No local independent cultural associations were found in the Aol during the surveys and no specific cultural activities seem to be organised.

6.12.3 Component sensitivity

According to the baseline information collected, no significant cultural heritage sites and archaeological sites are present in the Aol. For this reason the sensitivity of the cultural heritage component is considered to be Low both for the WF and OHL Aol.

6.13 Landscape

Considering the type of Project, impacts on the landscape component have been assessed in a specific report, the Visual Impact Assessment, provided as an annex to the ESIA. This report includes a comprehensive analysis of the landscape context and of the current situation. A summary of this report is provided in the present section.

The analysis of the landscape structure allows to identify the main components of the territorial context that define the "load-bearing structure" of the landscape. The selection of the elements described is functional to the Project activities and includes those that can potentially be more affected by the Project.

In particular, in the Aol the the following structures are considered relevant in the overall definition of the current landscape situation.

Settlement structure

Historical settlements: in the Aol the two main ones are Mitrovice and Vushtrri which dominate the plain area. Between the two cities near the M2 road and the railway there are villages related to industry or agriculture. In the hills, north of these cities, there are a considerable number of small rural villages, with relevant historical evidence.



Figure 35: City of Vushtrri, top view (by Bleron Vushtrri – Own work, CC BY-SA 3.0)

Recent settlements: There are numerous villages and conurbation areas, in particular small towns have developed along the new infrastructure axes (railway and M2 road). The presence of the numerous mines has also led to the creation of urbanized areas to accommodate the numerous workers of these mines.

Historical and landscape value artifacts: inside the two towns and villages there are numerous testimonies of the past, while in the rural or hilly areas there are numerous archaeological testimonies of various dates.

Hydrographic structure

Main and minor hydrographic system: the area between Mitrovice and Vushtrri is characterized by the presence of the main rivers, specifically the Silnice and Ibar rivers that flow along a very wide alluvial plain. In particular, the section subject to Project activities is characterized by curves, meanders and natural and vegetated banks. To the north of the alluvial plain, the watercourses, which are mainly torrential, characterize the landscape, affecting the slopes and creating a series of more or less extensive valleys.

- **Riverbeds:** In the alluvial plain between the two cities the presence of riverbeds is quite common, the presence of the ancient bridge of Vushtrri, which is now located completely in the mainland, testifies that the ancient course of the River Silnice has undergone a detour from the Middle Ages to the present day. The bridge is partially conurbated in the city of Vushtrri and the riverbeds is almost completely omitted.
- **Artificial water network:** in the area there is a network of channels for irrigation but many of them are in bad condition and have lost their functionality.

Environmental structure

Woods: The wooded area is mainly present in the hilly area between the settlements Pasome and Rashan and in the hilly area near the settlements of Bare and Bajgore. The most common vegetation is beech wood and oak wood, but there are also chestnut woods. Deforestation has made many areas free from woodland and cultivated or used as pasture. In the area north of Bajgore the vegetation is completely absent due to the high altitude and the exposure of the slopes.



Figure 36: Hill of Bajgore

Arboreal/arbustive vegetation: the riverbeds are sometimes delimited by arboreal/arbustive vegetation typical of hygrophilous areas. In particular along the rivers Silnice and Ibar there is an extensive vegetated corridor. In the hills it is possible to find areas with shrubby vegetation due to the type of soil or exposure.

Topographic structure

As can be seen in the following image, the topography of the Aol is very articulated.

The area of the WF and of the initial section of the OHL has mountainous features with heights ranging from 1200 to 1780 m above sea level. In particular, the WTGs are located on the ridges of this mountainous area. The following section of the OHL going south are in hilly areas with heights ranging between 600 and 1200 m. The final part of the OHL, where it connects to the existing substation is a large plain area with an altitude of about 500 m above sea level.



Figure 37: Topography of the Study Area

6.13.1 Type of landscape

The definition of 'landscape types' has been obtained by classifying the types of land use, taking into account the historical component of the landscapes.

The following landscape types have been identified in the Aol:

- **Landscape of historical settlements:** Landscape referring to the matrix of settlements of villages and historical cities, around which settlements have developed in recent years. It is generally characterized by a dense and compact building fabric, where the main elements of the community such as the mosque, the town hall, the hammam are located.
- **Landscape of the modern urban territory:** landscape referred to the building expansions of the historical nuclei, characterized by building fabric generally of low building density. Often it is the result of the expansion of the historical nuclei, which determines in some cases a landscape of low-density suburbs, where residential buildings coexist (sometimes surrounded by gardens and orchards), productive and commercial buildings and agricultural structures.
- **Peri-urban landscape - Diffused city:** landscape made up of scattered residential settlements and often mixed with farms. These centers frequently form small linear nuclei located along the main communication routes. They are often made up of artefacts with little architectural value and sometimes connected with areas of productive and artisan construction.
- **Landscape of the production complexes:** landscape characterized mainly by small and medium production and commercial complexes, located in the agricultural territory or on the edge of the inhabited areas, often in continuity with the landscape of the diffused city.
- **Landscape of rural village:** Small rural villages characterized by poor architecture surrounded by subsistence crops. This landscape is characterized either by small villages of historical texture or scattered settlements of recent formation developed near the roads.
- **Landscape of mining areas:** industrial landscape located in mining areas located near the two main cities and in some hilly areas.
- **Agricultural landscape of the plain:** agricultural landscape consisting mainly of arable land while the extension of natural meadows is small. The individual plots almost never exceed one hectare. The agriculture is mainly horticultural and fruit.
- **Agricultural landscape of the hills:** This type of landscape consists mainly of areas to pasture or agriculture at family level and not industrialized. Cattle and sheep breeding is typical of this environment. In this type of landscape there are many agricultural villages mainly concentrated along the road connecting to the plain.
- **Shrub landscape:** landscape characterized by the presence of shrubs or areas of regeneration characterized by a limited height of the vegetated area.
- **Forest landscape:** landscape almost absent in the plain area, the current state of the agricultural landscape is almost devoid of wooded areas, replaced by the productive use of land. Most of the wooded landscape is located along watercourses and canals, where there are strips of riparian vegetation. This typology is mainly present in the hilly areas, north of the plains area, where the vegetation is structured in forest systems of particular importance.

- **River landscape:** landscape made up of the main watercourses, such as Ibar and Silnice, and their tributaries from the hills to the north. In the hilly area, the rivers that cut through the valleys have a natural form appearance.
- **High mountain landscape:** Landscape consisting of areas with sparse vegetation intended for grazing in the summer months. Human presence is limited or non-existent.

6.13.2 Component sensitivity

The following table shows the estimation of the sensitivity with respect to the recognizability of the landscape, based on the characteristics and landscape qualities of the Study Area. The sensitivity level will be used as a reference for the estimation of landscape impacts. The details of the sensitivity classes are listed below.

Very low sensitivity

Areas of the urban fabric characterized by productive or mixed residential/production destination. They do not present any historical or environmental emergency. This part includes most of the productive urbanized area as it is considered an urban area without significant elements.

Low sensitivity

It includes built-up areas with high/low building density mainly adjacent to areas with very low sensitivity, where there is a presence (albeit lower) of productive activities and characterized by the absence of elements of environmental value.

Medium sensitivity

This class includes the built-up areas adjacent to the historical fabric in recognition of a greater value and need for protection, due to the maintenance of local identity.

This also includes areas of high perception placed at the edge of the urbanized, as well as urban areas representative for location even if without identity.

High sensitivity

This class includes areas where the parameters of the previous class are strongest, with the presence of valuable elements. This classification also includes the areas of historical and cultural value, part of the property and the historic centre. This class has also been assigned to the agricultural areas present in the hilly area.

Very high sensitivity

Emerging elements of exceptional value with respect to the surrounding area, which acquire a preponderant value within the reference territory by virtue of a high naturalistic value.

Table 20: Estimation of the sensitivity of the type of landscape

| TYPE OF LANDSCAPE | SENSITIVITY LEVEL | | NOTE |
|---|-------------------|--------|------|
| Landscape of historical settlements | ● ● ● ● | High | - |
| Landscape of the modern urban territory | ● ● ● | Medium | - |
| Peri-urban landscape - Diffused city | ● ● ● | Medium | - |

| TYPE OF LANDSCAPE | SENSITIVITY LEVEL | | NOTE |
|---------------------------------------|-------------------|-----------|---|
| Landscape of rural village | ● ● ● ● | High | |
| Landscape of the production complexes | ● ● | Low | - |
| Landscape of mining areas: | ● | Very low | |
| Agricultural landscape of the plain | ● ● ● | Medium | Increased sensitivity in the absence of vegetative barriers |
| Agricultural landscape of the hills | ● ● ● ● | High | Increased sensitivity in the absence of vegetative barriers |
| Shrub landscape: | ● ● ● ● | High | |
| Forest landscape: | ● ● ● ● ● | Very high | |
| River landscape | ● ● ● ● ● | Very high | |
| High mountain landscape | ● ● ● ● ● | Very high | |

6.14 Ecosystem services

6.14.1 Provisioning services

As indicate in section 6.9, the main provisioning ecosystem service is represented by wood collected in surrounding forests that represents the main heating source for the majority of respondents. Wood collecting is done in base of the needs of the families during winter for the heating, although also coal is used for heating.

In addition, a provisioning service is represented by the pasture land used for livestock rearing, particularly in the WF area, as indicated in section 6.6.

There are no major rivers in the Aol hence no fishing activities are performed. Likewise, limited activities of collection of mushroom or truffles are performed and they do not represent a significant source of income in the livelihood of the communities. Even if the Aol, especially in the villages of Bajgorë, Gumnishte, Rashan and Tërstenë, there are forests rich in wildlife, the hunting is not very practiced by the communities in the area, even though a part of the residents were former military during the war of 1998-1999 in Kosovo, but it is not a wide spread practice.

The area between Bare, Bajgorë and Kaçandoll is rich in natural water sources and water springs, which are used by local households; as indicates in section 6.9.3 people from other villages often come to the area to collect water.

6.14.2 Cultural services

Some daily tourism and picnics occur near the area of the Wind Farm in the periods of summer between June and August through family picnics with occasional and sporadic trekkers. During the winter, there is only one

structure that offers the possibility for accommodation and a restaurant, “Hotel Dodona” which has also a small ski lift.

There are no other structures in the area that can attract tourists, although there are beautiful nature areas and there have been some efforts to invest in this area and its natural attractions from the EU, but these efforts has resulted in small investments in areas where the infrastructure lies in pretty bad conditions.

Tourism does not represent an important economic activity for the region, although due to its geographical positioning the location can benefit from a winter recreational tourism. There are some initial plans for future development of the ski-recreational tourism although nothing concrete until now.

6.14.3 Component sensitivity

According to the baseline information collected, main ecosystem services used in the Aol are wood for heating of houses, pasture lands for animal rearing and water from springs. For this reason the sensitivity of the ecosystem services component is considered to be Medium both for the WF and OHL Aol.

6.15 Main problems faced by households and community

The main problem that their families are currently facing, mentioned by respondents (56%), is unemployment.

Another problem reported (19%) is the weak economy which leads to low income and economic difficulties. The entire region doesn't have a growing economy, and this is also why a lot of young people have emigrated, or at least moved in the urban areas.

It is important to notice that the majority of households emigrated during and after the war in Kosovo of 1999. The community members emigrated mostly in the European countries and most of them did not come back to the households or came just to reconstruct their houses which were destroyed from the war and left again.

After the war and nowadays the community members emigrate due to economic issues and also for a better life in urban areas and European countries. Due to this fact, the school director of Bajgorë village reported that the students have been halved in the last year.

Bajgorë village, the biggest village in the area, had approximately 200 households and now they are reduced in approximately 70 households. During the Survey 64 households were interviewed, which means approx. 90 % of the total households and in this regard we have a clear picture of the living conditions in the village. This situation appears to be similarly in all the villages when the socio-economic survey took place.

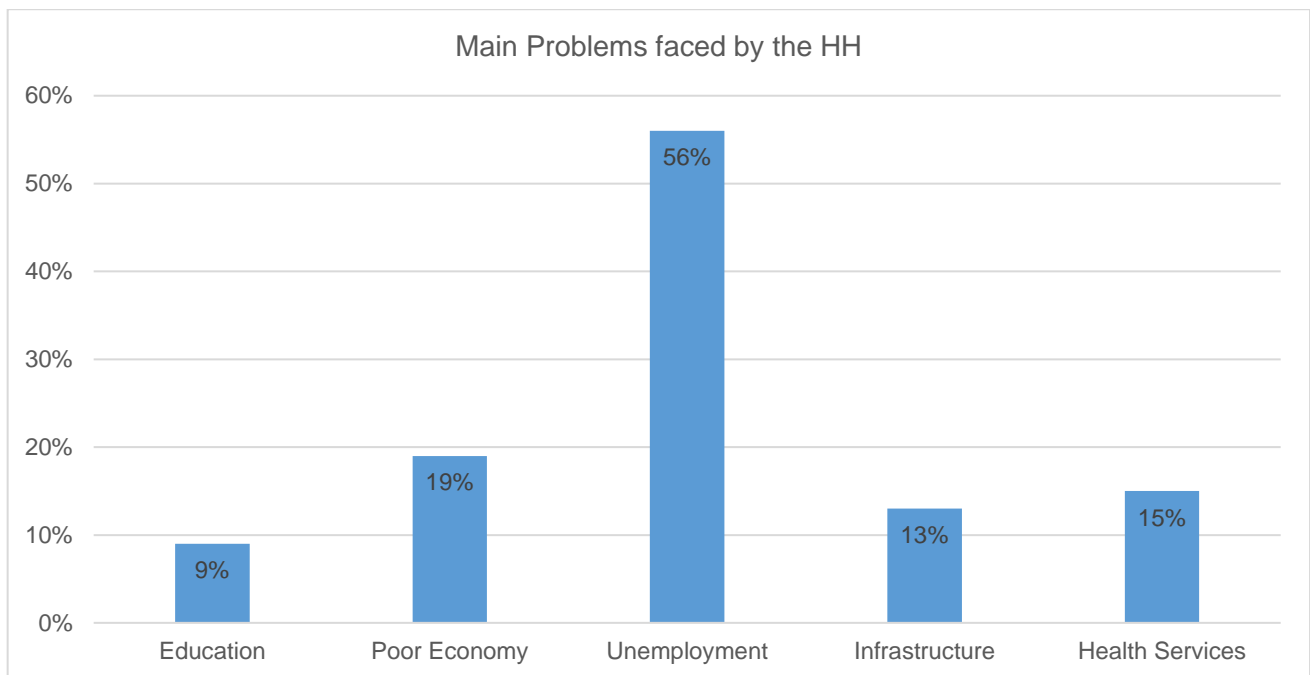


Figure 38: Main household issues in the Aol reported by Survey

When considering community problems, respondents have mentioned in majority (91%) the unemployment has their main issue. Unemployment levels in the area are high mainly due to the fact that the majority of community members in this area were employed in the Trepça Mine, which has significantly reduced the number of workers over the years. Nowadays most of the households have low incomes mostly from social assistance. Majority of households use the livestock products for personal consumption, except a few of the households which have developed the livestock and sell the products. The last category also receives subventions from the state (Ministry of Agriculture)

Other problems mentioned, as shown in the chart below, are health services and road infrastructure. The supply of electric energy and education require improvements as well according to respondents. In particular interruptions in the supply of electric energy is a big problem for this area, especially in winter, when due to weather conditions and the lack of investment in electric infrastructure, the energy interruption is an issue, sometimes even 2 days energy interruption. Considering the fact that the electricity is one of the main enabler for every households activities, it is evident that the electric network needs improvement.

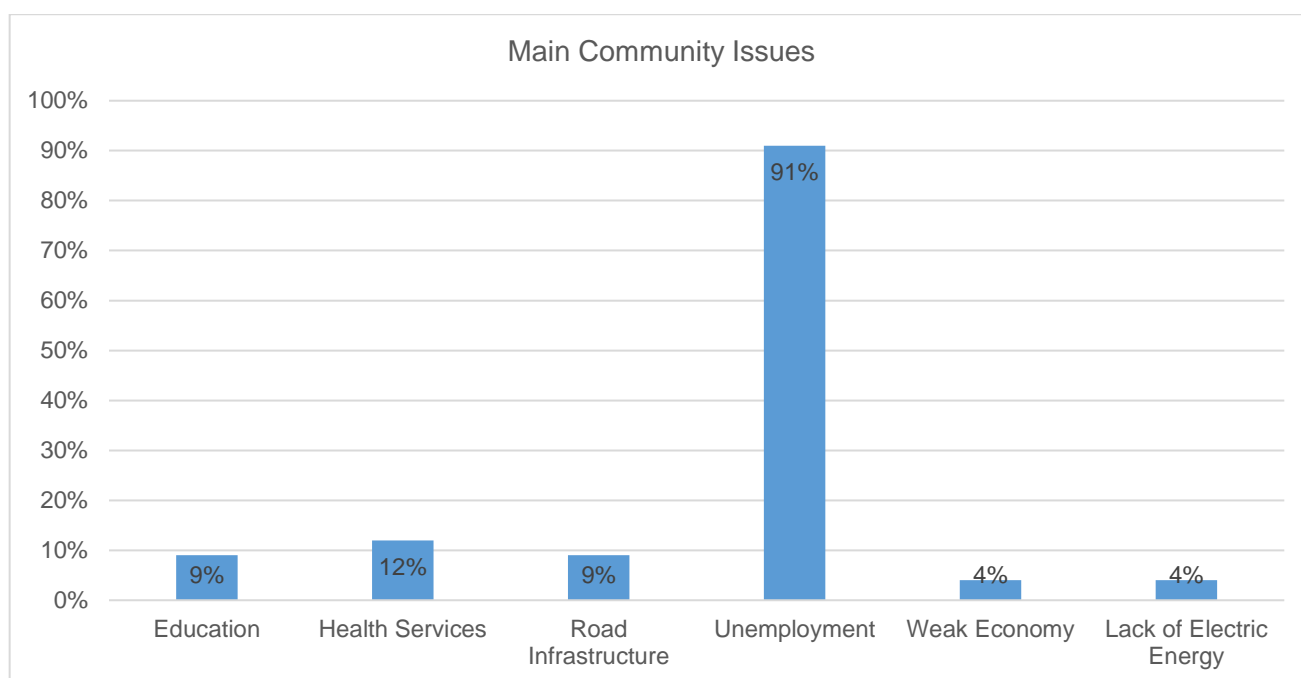


Figure 39: Main community issues in the Aol reported by Survey

In summary, based on the outcomes of field activities performed, economic conditions of households seem to represent the most problematic issue within the Aol and lead to wider social phenomena like emigration. The villages in the Aol are not very far, in terms of distance from the urban areas, or the capital, but they are somehow isolated due to low investments in infrastructure, electric energy or tourism, which leads to a general sense of lack of opportunities for the local population.

APPENDIX A

**Archaeological Consent for the
Wind Farm and for the Overhead
Line**



INSTITUTI ARKEOLOGJIK I KOSOVËS
ARCHEOLOGICAL INSTITUTE OF KOSOVA

INSTITUTI ARKEOLOGJIK I KOSOVËS
Nr. 385-03
11/10/2017
PRISHTINE

Kërkesa e Sh.P.K. "SOWI-Kosovo", Prishtinë, për lëshim të Pëlqimit për ndërtim të Parqeve Energjetike dorëzuar në Institutin Arkeologjik të Kosovës (IAK) me Nr.384/03 dt. 09/10/2017, u realizua nga IAK-u pas punëve - vëzhgimit në terren, Raportit të punës të dt. 10/10/2017. IAK pas shqyrtimit të lëndës, vendos të lëshon këtë:

P Ë L Q I M

Për ndërtimin e Parqeve Energjetike nga Era sipas projekteve Selac 1, Selac 2, Selac 3 ku do të vendosen dhe turbinat e bazamentet në Zonat Kadastrale Selac, Bajgorë, Rzhinë e Kaçandoll


Duke u mbështetur në të dhënat e Trashëgimisë Kulturore – Arkeologjike që posedon Instituti Arkeologjik i Kosovës (IAK) dhe duke u bazuar në përnjohjen e terrenit të realizuar nga grupi i punonjësve të Institutit Arkeologjik me dt. 10/10/2017, IAK konstaton se: në vendet – zonat kadastrale/parcelat të paraqitura nga Kërkesa e SHPK "Sowi-Kosovo" sipas projektit ku do të vendosen pajisjet për prodhimin e energjisë nga era dhe vendosja e turbinave e bazamenteve nuk ka gjurmë arkeologjike – kulturore, historike. Gjatë përnjohjes – vëzhgimit nuk kemi vërejtur ekzistim të lokaliteteve arkeologjike apo të monumenteve të llojeve të tjera të trashëgimisë kulturore e as që kemi vërejtur potencial të mbetjeve-gjetjeve arkeologjike.

IAK i lëshon Pëlqim-in Sh.P.K. "SOWI-Kosovo", Prishtinë për ndërtimin e Parqeve Energjetike – montimin, vendosjen e turbinave dhe pajisjeve përcjellëse për prodhimin e energjisë së ripërtërishme (energji nga era) në sipërfaqet me numër të parcelave dhe zonave kadastrale të shënuara në "Kërkesë për Pëlqim" të hartuar nga Sh.P.K. "SOWI-Kosovo", Prishtinë e dt. 09/10/2017, që përfshin fshatrat: Selac, Bajgorë, Rzhinë e Kaçandoll (Pëlqimit ti bashkëngjitet lënda në fjalë ku paraqiten numrat e parcelave, zonat kadastrale, hapësirat etj.).

Shënim: Sipas Ligjit për Trashëgiminë Kulturore, Nr. 02/L-88, Nenit 7.6, 7.8, 7.9, Udhëheqësi i punimeve - pronari merr përgjegjësi dhe obligohet që me rastin e punimeve në hapësirën e përcaktuar si më lartë të na njoftoj me kohë për përcjelljen e tyre, e po ashtu, pronari detyrohet që në rast se, has në gjurmë arkeologjike apo gjetje me vlera të Trashëgimisë Kulturore të njoftojnë menjëherë (në afatin e caktuar me Ligj) Institutin Arkeologjik të Kosovës apo Departamentin e Trashëgimisë Kulturore në Ministrinë e Kulturës.

Me respekt,

Prishtinë, 11/10/2017

Drejtor

Dr. sc. Enver Rexha



INSTITUTI ARKEOLOGJIK I KOSOVËS
ARCHEOLOGICAL INSTITUTE OF KOSOVA

INSTITUTI ARKEOLOGJIK I KOSOVËS
Nr. 90-03
Dt. 11/04/2019
PRISHTINË

Kërkesa e L.L.C. "SOWI-Kosovo", Prishtinë, për lëshim të Pëlqimit për ndërtimin e largpërcuesit për parqet energjetike Selac 1/2/3 në fshatin Selac, dorëzuar në Institutin Arkeologjik të Kosovës (IAK) me Nr.71/03 dt. 22/03/2019, u realizua nga IAK-u pas punëve - vëzhgimit në terren, Raportit të punës të dt. 11/04/2019. IAK pas shqyrtimit të lëndës, vendos të lëshon këtë:

PËLQIM

Për ndërtimin e Largpërcuesit për Parqet Energjetike Selac 1, Selac 2, Selac 3 në Bajgorë, Komuna Mitrovicë, nga Kompania "Sowi Kosovo", L.L.C

Duke u mbështetur në të dhënat e Trashëgimisë Kulturore – Arkeologjike që posedon Instituti Arkeologjik i Kosovës (IAK) dhe duke u bazuar në përnjohjen e terrenit të realizuar nga grupi i punonjësve të Institutit Arkeologjik me dt. 11/04/2019, IAK konstaton se: në vendet – zonat kadastrale/parcelat të paraqitura në Kërkesë (Projekt) të L.L.C. "Sowi-Kosovo" ku do të vendosen pajisjet për prodhimin e energjisë nga era - vendosja e turbinave e bazamenteve nuk ka gjurmë arkeologjike – kulturore, historike. Gjatë përnjohjes – vëzhgimit nuk kemi vërejtur ekzistim të lokaliteteve arkeologjike apo të monumenteve të llojeve të tjera të trashëgimisë kulturore e as që kemi vërejtur potencial të mbetjeve-gjetjeve arkeologjike.

IAK i lëshon Pëlqim-in L.L.C. "SOWI-Kosovo", Prishtinë, për ndërtimin e Largpërcuesit për Parqet Energjetike – montimin, vendosjen e turbinave dhe pajisjeve përcjellëse për prodhimin e energjisë së ripërtërishme (energji nga era) në sipërfaqet me numër të parcelave dhe zonave kadastrale të shënuara në "Kërkesë për Pëlqim" (Projekt) të hartuar nga L.L.C. "SOWI-Kosovo" për Selac 1, Selac 2, Selac 3 në Bajgorë, Komuna Mitrovicë.

Shënim: Sipas **Ligjit për Trashëgiminë Kulturore, Nr. 02/L-88, Nenit 7.6, 7.8, 7.9**, Udhëheqësi i punimeve - pronari merr përgjegjësi dhe obligohet që me rastin e punimeve në hapësirën e përcaktuar si më lartë të na njoftoj me kohë për përcjelljen e tyre, e po ashtu, pronari detyrohet që në rast se, has në gjurmë arkeologjike apo gjetje me vlera të Trashëgimisë Kulturore të njoftojnë menjëherë (në afatën e caktuar me Ligj) Institutin Arkeologjik të Kosovës apo Departamentin e Trashëgimisë Kulturore në Ministrinë e Kulturës.

Me respekt,

Prishtinë, 11/04/2019


Drejtor
Dr. sc. Enver Rexha



REPORT

Bajgora Wind Project
Environmental and Social Impact Assessment
Section 7 - Impact Assessment

Submitted to:

SOWI Kosovo LLC

Submitted by:

Golder Associates S.r.l.

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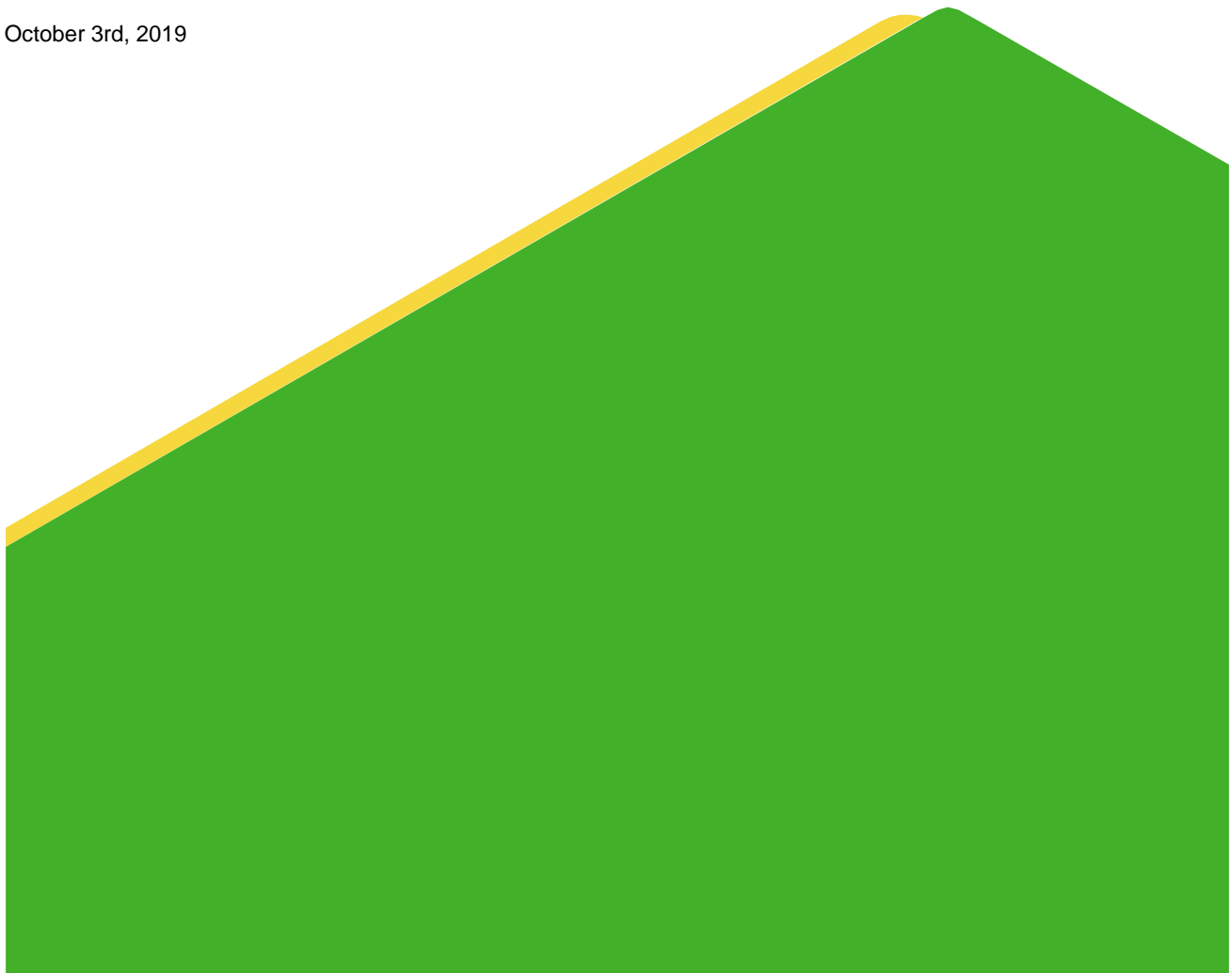


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7.0 IMPACT ASSESSMENT AND MITIGATION

This chapter presents the results of the impact assessment conducted according to the methodology described in Section 5.

7.1 Assessment of the impacts for physical components

7.1.1 Geomorphology and topography

7.1.1.1 Construction phase

7.1.1.1.1 Impact Analysis

The following **project actions** will generate impact factors on the geomorphology and topography component during the construction phase of WF and OHL:

- Surface levelling and grading;
- Vegetation clearance;
- Blasting;
- Construction of deposit areas.

The potential impacts on geomorphology and topography deriving from the above actions are associated with the following **impact factors**:

- Change in the local morphology;
- Removal/degradation of soil and vegetation.

Here follows a description of the above-mentioned **impact factors**:

Change in the local morphology: in the construction phase this impact factor will be mainly related to blasting and surface levelling/grading during the following activities:

- Adaptation/construction of access roads in both WF and OHL areas;
- Land levelling and excavation along the OHL;
- Construction of crane pads and wind turbines' emplacements in WF area;
- Construction of permanent deposit areas of excess material from surface levelling/grading activities.

Removal/degradation of soil and vegetation: in the construction phase this impact factor will be mainly related to vegetation clearance and surface levelling/grading during the following activities:

- Adaptation/construction of access roads in both WF and OHL areas;
- Land levelling and excavation along the OHL;
- Construction of crane pads and wind turbines' emplacements in WF area.

In the WF area and in the mountain area along the OHL blasting, excavation and vegetation clearance may locally modify the flow pattern and infiltration coefficient of meteoric water. These local effects may trigger or enhance sheet erosion and rill/gully accelerated erosion phenomena. Accelerated erosion phenomena may affect the local stability of natural soil, surface eluvial-colluvial deposits and embankments built during above-mentioned activities in correspondence to access roads, wind turbines and OHL pylons. During construction phase accelerated erosion phenomena may also be triggered or enhanced by grooves caused by off-road vehicular traffic in slope areas.

Permanent deposit areas will be located in the WF area, in correspondence to the ridge of the mountain or in the upper part of secondary valleys. In both cases the deposits of material will cause a change of local morphology and may be affected by local instability phenomena caused by gravity or accelerated erosion, if not properly designed and built. The average height of the planned deposit areas ranges from 2.5 m to 4.0 m.

In Sitnica River plain area, changes in the local morphology related to the construction of OHL pylons and access roads may interfere with water flow patterns during flood events. This interaction may result in the disruption of OHL functionality.

7.1.1.1.2 Mitigation measures

The mitigation measures listed below follow the mitigation hierarchy and will be implemented for the construction phase for the entire area that will be disturbed by the Project:

■ **Avoidance:**

- Avoid off-road vehicular traffic;
- Avoid uncontrolled discharge of stormwater from drainage network in correspondence to wind turbines emplacements and access roads;
- Avoid uncontrolled dumping of excavated material during the construction of deposit areas;

■ **Minimization:**

- Minimize the extension of land levelling and excavation areas;
- Minimize the extension of artificial embankments;
- Minimize erosion of artificial embankments and levelled areas by means of erosion control techniques and erosion protection devices;
- Minimize the extension of above ground structures in flood prone areas in the Sitnica River plain area;
- Minimize the potential instability of permanent deposit areas by means of geotechnical design, stability assessment and stormwater drainage and management;

■ **Restore:**

- Reinstatement of deposit areas by means of a final soil cover that shall be revegetated with indigenous grasses and shrubs;
- Restoration of incipient erosion phenomena in slope areas along access road and in correspondence to wind turbines and OHL pylons.

7.1.1.1.3 Residual impacts

Considering the application of the abovementioned mitigation measures, the impact on the geomorphology and topography component is depicted in the following tables and it is expected to be:

- For the WF area: **medium**;
- For the OHL area: **low**.

Table 1: WF area - residual impact assessment matrix for geomorphology and topography component during construction phase

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|--|------------------------|-------------------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| Change in the local morphology | Duration: | Medium | Medium-high | Irreversible | High | Medium-high | Medium |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Project footprint | | | | | |
| | Intensity: | Medium | | | | | |
| Removal/degradation of soil and vegetation | Duration: | Medium | Medium-high | Irreversible | High | Medium-high | Medium |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Low | | | | | |

Table 2: OHL area - residual impact assessment matrix for geomorphology and topography component during construction phase

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|--|------------------------|-------------------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| Change in the local morphology | Duration: | Medium | Medium-low | Irreversible | Medium | Medium-high | Low |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Project footprint | | | | | |
| | Intensity: | Negligible | | | | | |
| Removal/degradation of soil and vegetation | Duration: | Medium | Medium-low | Mid term | Low | Medium-high | Negligible |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Project footprint | | | | | |
| | Intensity: | Negligible | | | | | |

7.1.1.1.4 Monitoring

The following monitoring activities will be performed to ensure the implementation and effectiveness of the proposed mitigation measures:

- Periodic visual inspection of wind turbine emplacements, OHL pylons, access roads and other embankments in slope areas. The aim of the inspection is to identify possible instability and accelerated erosion phenomena, in order to implement early restoration actions;
- Periodic visual inspection and maintenance of erosion control devices put in place in correspondence to artificial embankments;
- Periodic visual inspection and maintenance of permanent deposit areas and associated stormwater drainage network. The aim of the inspection is to identify possible instability and accelerated erosion phenomena affecting the final cover and the body of the deposits.

7.1.2 Geology and seismicity

7.1.2.1 Construction phase

7.1.2.1.1 Impact Analysis

The following **project actions** will generate impact factors on the geology component during the construction phase of WF and OHL:

- Temporary stockpiling of material;
- Construction of the wind turbine foundations;
- Construction of the wind turbines;
- Construction of OHL pylon foundations;

- Construction of the OHL pylons;
- Construction of deposit areas.

The potential impacts on geology deriving from the above actions are associated with the following **impact factors**:

- Presence of new buildings/infrastructures.

Here follows a description of the above-mentioned **impact factors**:

Presence of new buildings/infrastructures: in the construction phase this impact factor will be related to the constructions of all new structures and infrastructures during the following activities:

- Adaptation/construction of access roads in both WF and OHL areas;
- Installation of wind turbines;
- Installation of the OHL pylons;
- Construction of permanent deposit areas of excess material from surface levelling/grading activities.

With regard to the geology component, relevant impacts related to emission of dust and particulate matter may be expected in the part of the WF area characterized by the presence of natural occurring asbestos. In the area included between wind turbines **II-14** and **III-25** natural asbestos may be included not only in the bedrock rock mass (comprised of serpentinized ultramafic rocks), but also in the Quaternary eluvial-colluvial deposits formed by its weathering and erosion. In this area, all the activities causing the emission of dust and particulate matter may also potentially cause the dispersion of airborne asbestos fibres. The impacts on air quality due to asbestos fibres emissions are discussed in Chapter 7.6.

Potential impacts concerning the presence of new buildings and infrastructures are related to the seismicity of the area. With regard to this impact factor, the potential interference with the component is not represented by an effect of the Project on the environment, but rather by the potential effects of seismic events on the integrity and the operativity of structures and infrastructures related to the Project.

In both WF and OHL areas there are sectors where local seismic hazard may be potentially increased by topographic and stratigraphic amplification of seismic waves, such as narrow ridges or thin Quaternary covers overlying crystalline bedrock.

7.1.2.1.2 Mitigation measures

The mitigation measures listed below follow the mitigation hierarchy and will be implemented for the construction phase for the entire area that will be disturbed by the Project:

- **Avoidance:**
 - No actions
- **Minimization:**
 - Minimize the risk related to seismic hazard by means of geotechnical characterization of construction sites and structural design compliant with Eurocodes standards.

7.1.2.1.3 Residual impacts

Considering the application of the abovementioned mitigation measures, the impact on the geology and seismicity component is depicted in the following tables and it is expected to be:

- For the WF area: **low**;
- For the OHL area: **low**.

Table 3: WF area - residual impact assessment matrix for geology and seismicity component during construction phase

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---|------------------------|-------------------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| Presence of new buildings/infrastructures | Duration: | Medium | Very high | Irreversible | Very High | High | Low |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Project footprint | | | | | |
| | Intensity: | Medium | | | | | |

Table 4: OHL area - residual impact assessment matrix for geology and seismicity component during construction phase

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---|------------------------|-------------------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| Presence of new buildings/infrastructures | Duration: | Medium | Medium | Irreversible | High | High | Low |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Project footprint | | | | | |
| | Intensity: | Medium | | | | | |

7.1.2.1.4 Monitoring

No specific monitoring measures are foreseen for this component.

7.1.2.2 Operation Phase

7.1.2.2.1 Impact Analysis

During the operation phase, potential impacts related to the geology component are associated with a single **impact factor**, represented by the Presence of new buildings/infrastructures. Potential impacts concerning the presence of new buildings, deposit areas and infrastructures in both WF and OHL areas are related to the seismicity of the area, as described in section 7.1.2.1.1.

7.1.2.2.2 Mitigation measures

Mitigation measures of impacts related to seismic hazard are mainly implemented in the construction phase, because they are related to geotechnical site characterization and structural design. During operation phase impacts related to seismic hazard can be minimized through suitable maintenance of existing structures and infrastructures.

7.1.2.2.3 Residual impacts

Considering the application of the abovementioned mitigation measures, the impact on the geology component is depicted in the following tables and it is expected to be:

- For the WF area: **low**;
- For the OHL area: **low**.

Table 5: WF area - residual impact assessment matrix for geology and seismicity component during operation phase

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---|------------------------|-------------------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| Presence of new buildings/infrastructures | Duration: | Long | Very high | Irreversible | Very High | High | Low |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Project footprint | | | | | |
| | Intensity: | Medium | | | | | |

Table 6: OHL area - residual impact assessment matrix for geology and seismicity component during operation phase

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---|------------------------|-------------------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| Presence of new buildings/infrastructures | Duration: | Long | Medium | Irreversible | High | High | Low |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Project footprint | | | | | |
| | Intensity: | Medium | | | | | |

7.1.2.2.4 Monitoring

During the operation phase the implementation and effectiveness of the proposed mitigation measures can be ensured by means of a periodic inspection and check of integrity and functionality of existing structures and infrastructures.

7.1.3 Soils and land use

7.1.3.1 Construction phase

7.1.3.1.1 Impact Analysis

The following **project actions** will generate impact factors on the soil and land use component during the construction phase of WF and OHL:

- Surface levelling and grading;
- Vegetation clearance;
- Blasting;
- Land acquisition;
- Construction of deposit areas.

The potential impacts on soil and land use deriving from the above actions are associated with the following **impact factors**:

- Change in the local morphology;
- Removal/degradation of soil and vegetation;
- Change in land use and ownership.

Here follows a description of the above-mentioned **impact factors**:

Change in the local morphology: in the construction phase this impact factor will be mainly related to surface levelling/grading during the following activities:

- Adaptation/construction of access roads in both WF and OHL areas;
- Land levelling and excavation along the OHL;

- Construction of crane pads and wind turbines' emplacements in WF area;
- Construction of permanent deposit areas of excess material from surface levelling/grading activities.

Removal/degradation of soil and vegetation: in the construction phase this impact factor will be mainly related to vegetation clearance and surface levelling/grading during the following activities:

- Site preparation, including construction of temporary deposit and storage areas;
- Adaptation/construction of access roads in both WF and OHL areas;
- Land levelling and excavation along the OHL;
- Construction of crane pads and wind turbines' emplacements in WF area.

As stated in section 7.1.1, in the WF area and in the mountain area along the OHL blasting, excavation and vegetation clearance may locally modify the flow pattern and infiltration coefficient of meteoric water. These local effects may trigger or enhance sheet erosion and rill/gully accelerated erosion phenomena. During construction phase accelerated erosion phenomena may also be triggered or enhanced by grooves caused by off-road vehicular traffic in slope areas. The implications of soil erosion by running water extend beyond the removal of valuable topsoil. Crop emergence, growth and yield, grazing land quality are directly affected by the loss of natural nutrients and applied fertilizers. Seeds and plants can be disturbed or completely removed by the erosion. Organic matter from the soil, residues and any applied manure, is relatively lightweight and can be readily transported off the field, particularly during spring thaw conditions. Pesticides may also be carried off the site with the eroded soil.

Soil quality, structure, stability and texture can be affected by the loss of soil. The breakdown of aggregates and the removal of smaller particles or entire layers of soil or organic matter can weaken the structure and even change the texture. Textural changes can in turn affect the water-holding capacity of the soil, making it more susceptible to extreme conditions such as drought.

The construction of permanent deposit areas of excavated material will cause a change of local morphology that will affect soil and may locally modify the flow pattern and infiltration coefficient of meteoric water. As stated above these local effects may trigger or enhance accelerated erosion phenomena.

Land acquisition and change in land use may affect agricultural productivity and grazing land quality. Change of land use associated with vegetation clearance may permanently alter the setting of vegetated areas.

7.1.3.1.2 Mitigation measures

The mitigation measures listed below follow the mitigation hierarchy and will be implemented for the construction phase for the entire area that will be disturbed by the Project:

- **Avoidance:**
 - Avoid off-road vehicular traffic;
 - Avoid uncontrolled discharge of stormwater from drainage network in correspondence to wind turbines emplacements, deposit areas and access roads;
 - Avoid access to agricultural and grazing areas that have not been acquired or compensated in line with indications of the LALRF;
- **Minimization:**
 - Minimize the extension of land levelling and excavation areas;
 - Minimize the extension of access roads in the OHL area;

- Minimize the extension of artificial embankments;
- Minimize the extension of deposit areas;
- Minimize the extension of temporary storage and deposit areas;
- Design access roads and storage/deposit areas in order to minimize soil disturbance and clearance of vegetation, crops and grazing land;

■ **Restore:**

- Restoration of incipient erosion phenomena in slope areas along access road and in correspondence to wind turbines and OHL pylons;
- During land levelling and excavation works the topsoil must be properly collected and stored on site. It shall be used to rehabilitate the site back to its original state. This mitigation measure shall be adopted also for the reinstatement of temporary sites;
- During the construction of deposit areas, the topsoil must be properly collected and stored on site. It shall be used to build the final capping of the deposit and it shall be revegetated;
- All areas affected by work activities will be reinstated. No surface will be left unrehabilitated or unmanaged at the end of the construction phase.

■ **Compensate:**

- compensate landowner in case of land acquisition or permanent damage to agricultural or grazing land in line with indications of the LALRF.

7.1.3.1.3 Residual impacts

Considering the application of the abovementioned mitigation measures, the impact on the soil and land use component is depicted in the following tables and it is expected to be:

- For the WF area: **medium**;

- For the OHL area: **low**.

Table 7: WF area - residual impact assessment matrix for soil and land use component during construction phase

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|--|------------------------|-------------------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| Change in the local morphology | Duration: | Medium | Medium | Irreversible | High | Medium | Medium |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Project footprint | | | | | |
| | Intensity: | Medium | | | | | |
| Removal/degradation of soil and vegetation | Duration: | Medium | Medium | Mid term | Medium | Medium | Low |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Project footprint | | | | | |
| | Intensity: | Low | | | | | |
| Change in land use and ownership | Duration: | Medium | Medium | Irreversible | High | Medium | Medium |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Project footprint | | | | | |
| | Intensity: | Low | | | | | |

Table 8: OHL area - residual impact assessment matrix for soil and land use component during construction phase

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|--|------------------------|-------------------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| Change in the local morphology | Duration: | Medium | Medium-low | Irreversible | Medium | Medium | Low |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Project footprint | | | | | |
| | Intensity: | Negligible | | | | | |
| Removal/degradation of soil and vegetation | Duration: | Medium | Medium-low | Mid term | Low | Medium | Low |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Project footprint | | | | | |
| | Intensity: | Negligible | | | | | |
| Change in land use and ownership | Duration: | Medium | Medium-low | Irreversible | Medium | Medium | Low |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Project footprint | | | | | |
| | Intensity: | Negligible | | | | | |

7.1.3.1.4 Monitoring

The following monitoring activities will be performed to ensure the implementation and effectiveness of the proposed mitigation measures:

- Periodic visual inspection of wind turbine emplacements, OHL pylons, access roads and other embankments in slope areas. The aim of the inspection is to identify possible instability and accelerated erosion phenomena, in order to implement early restoration actions;
- Periodic visual inspection and maintenance of erosion control devices put in place in correspondence to artificial embankments;
- Periodic visual inspection and maintenance of permanent deposit areas. The aim of the inspection is to verify the integrity of the capping and the functionality of the stormwater drainage network.

7.1.4 Hydrology and surface water

7.1.4.1 Construction phase

7.1.4.1.1 Impact Analysis

The following **project actions** will generate impact factors on the hydrology and surface water component during the construction phase of WF and OHL:

- Surface levelling and grading;
- Construction of wind turbine foundations;
- Construction of OHL pylon foundations.

The potential impacts on hydrology and surface water deriving from the above actions are associated with the following **impact factors**:

- Change in the local hydrology;
- Demand for freshwater.

Here follows a description of the above-mentioned **impact factors**:

Change in the local hydrology: in the construction phase this impact factor will be mainly related to surface levelling/grading during the following activities:

- Site preparation, including construction of temporary deposit and storage areas;

- Adaptation/construction of access roads in both WF and OHL areas;
- Land levelling and excavation along the OHL;
- Construction of crane pads and wind turbines' emplacements in WF area.

Demand for freshwater: in the construction phase this impact factor will be mainly related to potential freshwater abstraction from surface water bodies for concrete production.

As stated in section 7.1.1, in the WF area and in the mountain area along the OHL blasting, excavation and vegetation clearance may locally modify the flow pattern and infiltration coefficient of meteoric water; construction of access roads and impermeable areas (concrete pads) will also affect the natural flow pattern of meteoric water in the area.

Uncontrolled discharge of stormwater from drainage network in correspondence to construction areas, wind turbines emplacements and access roads may cause two main type of impacts on local hydrology:

- Increase of erosion along existing secondary hydrographic network or extension of the secondary hydrographic network caused by rill and gully erosion, that will lead to the formation of new natural flow channels for meteoric water;
- Excavation and levelling/grading activities may increase the availability of erodible particulate matter. Uncontrolled discharge of stormwater and accelerated erosion phenomena may increase the quantity of sediments carried by water to local water bodies, increasing turbidity level.

In the windfarm area, above mentioned impacts may be relevant in the case of the two wetlands located wind turbines I-01 and I-02. Increase of water flow and sediment supply may affect both hydraulic and ecological functionality of these water bodies.

7.1.4.1.2 Mitigation measures

The mitigation measures listed below follow the mitigation hierarchy and will be implemented for the construction phase for the entire area that will be disturbed by the Project:

- **Avoidance:**
 - Avoid of off-road vehicular traffic;
 - Avoid uncontrolled discharge of stormwater from drainage network in correspondence to construction areas, wind turbines emplacements and access roads;
 - Avoid stormwater discharge in correspondence to natural wetlands;
 - Avoid driving across waterbodies and streams without a proper crossing facility (bridge, culvert or other structure). Direct contact between vehicles/equipment and water or stream beds must be avoided. The use of fords must be avoided, even for crossing small streams without perennial flow.
- **Minimization:**
 - Minimize the extension low permeability and impermeable areas;
 - Design a suitable stormwater drainage network in correspondence to access roads, wind turbines, temporary storage/deposit areas and other relevant construction areas. Stormwater from the drainage network must be channelled to secondary hydrographic network or other suitable drainage feature and discharged in a controlled way. Appropriate measures must be adopted to protect discharge points and channels from erosion;
 - Produce and implement a stormwater and erosion management plan;

■ Restore:

- Restoration of incipient erosion phenomena in correspondence to stormwater discharge points.

7.1.4.1.3 Residual impacts

Considering the application of the abovementioned mitigation measures, the impact on the hydrology and surface water component is depicted in the following tables and it is expected to be:

- For the WF area: **low**;
- For the OHL area: **negligible**.

Table 9: WF area - residual impact assessment matrix for hydrology and surface water component during construction phase

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|-------------------------------|------------------------|---------------------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| Change in the local hydrology | Duration: | Medium | Medium-high | Mid term | Medium | Medium-high | Low |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Medium | | | | | |
| Demand for freshwater | Duration: | Medium | Medium-high | Short-term | Low | Medium-high | Negligible |
| | Frequency: | Moderately frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Low | | | | | |

Table 10: OHL area - residual impact assessment matrix for hydrology and surface water component during construction phase

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|-------------------------------|------------------------|---------------------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| Change in the local hydrology | Duration: | Medium | Medium | Short-term | Negligible | Medium-high | Negligible |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Negligible | | | | | |
| Demand for freshwater | Duration: | Medium | Medium | Short-term | Negligible | Medium-high | Negligible |
| | Frequency: | Moderately frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Negligible | | | | | |

7.1.4.1.4 Monitoring

The following monitoring activities will be performed to ensure the implementation and effectiveness of the proposed mitigation measures:

- Periodic visual inspection of stormwater drainage network, in order to verify its integrity and functionality;
- Periodic visual inspection of stormwater discharge points. The aim of the inspection is to identify possible incipient accelerated erosion phenomena, in order to implement early restoration actions.

7.1.4.2 Operation Phase

7.1.4.2.1 Impact Analysis

During the operation phase, potential impacts related to the hydrology and surface water component are associated with a single **impact factor**, represented by the Change in the local hydrology.

During operation, integrity and functionality of the stormwater drainage network along access roads and in correspondence to wind turbines and other permanent structures may be reduced and compromised by normal wear and exceptional rainfall events.

Disruption stormwater drainage network may locally cause the uncontrolled discharge of stormwater on natural slopes and artificial embankments, with the same consequences described in section 7.1.4.1.1 with regard to construction phase.

7.1.4.2.2 Mitigation measures

The mitigation measures listed below follow the mitigation hierarchy and will be implemented for the operation phase for the entire area that will be disturbed by the Project:

■ Avoidance:

- Avoid uncontrolled discharge of stormwater from drainage network in correspondence to wind turbines emplacements, access roads and other permanent structures;
- Avoid stormwater discharge in correspondence to natural wetlands;

■ Minimization:

- Perform a suitable stormwater drainage network in correspondence to access roads, wind turbines, temporary storage/deposit areas and other relevant construction areas. Stormwater from the drainage network must be channelled to secondary hydrographic network or other suitable drainage feature and discharged in a controlled way. Appropriate measures must be adopted to protect discharge points and channels from erosion;
- Implement monitoring and maintenance activities included in the stormwater and erosion management plan.

■ Restore:

- Restoration of incipient erosion phenomena in correspondence to stormwater discharge points.

7.1.4.2.3 Residual impacts

Considering the application of the abovementioned mitigation measures, the impact on the hydrology and surface water component is depicted in the following tables and it is expected to be:

- For the WF area: **low**;
- For the OHL area: **negligible**.

Table 11: WF area - residual impact assessment matrix for hydrology and surface water component during operation phase

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|-------------------------------|------------------------|----------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| Change in the local hydrology | Duration: | Long | Medium-high | Mid term | High | Medium-high | Low |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Low | | | | | |

Table 12: OHL area - residual impact assessment matrix for hydrology and surface water component during operation phase

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|-------------------------------|------------------------|------------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| Change in the local hydrology | Duration: | Long | Medium | Short-term | Negligible | Medium-high | Negligible |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Negligible | | | | | |

7.1.4.2.4 Monitoring

The following monitoring activities will be performed to ensure the implementation and effectiveness of the proposed mitigation measures:

- Periodic visual inspection of stormwater drainage network, in order to verify its integrity and functionality;
- Periodic visual inspection of stormwater discharge points. The aim of the inspection is to identify possible incipient accelerated erosion phenomena, in order to implement early restoration actions.

7.1.5 Climate and climate risks

The project objective is to generate electricity to be dispatched to the electrical grid in Kosovo. The production of electricity by wind farms does not entail the emission of greenhouse gases (GHG) during their operation. According to the “EBRD protocol for assessment of greenhouse gas emissions”, construction related GHG emissions as well as upstream and downstream GHG emissions should not be considered in the case of wind projects.

The current electricity production in Kosovo is based on two lignite fired power plants; Kosova A (5 units with 800 MW installed) and Kosova B (two units with 678 MW installed). Electricity generation from these two plants in 2018 has been around 5600 GWh.

Greenhouse gas emissions from these two plants amount at about 5.4 Mt of CO₂e and represent 82% of the overall GHG emissions in Kosovo. The GHG intensity of the electricity production from the thermal power sector in Kosovo can therefore be estimated in 0.96 tonCO₂e/MWh (which is in line with the estimates of 0,79 – 1,37 t/MWh according to the WNA Report).

The planned Bajgore wind farm has an estimated electricity production between 300,000 and 340,000 MWh/year. Considering the median production at 320,000 MWh/year it is possible to estimate the avoided emissions at about 309,000 tonCO₂/year. This represents about 5.7% of the annual estimated GHG emissions from the electricity generation sector in Kosovo and the 4.7% of the overall GHG emissions for the country.

Negative impacts on climate due to the Project are associated with the release of CO₂ emissions from vehicles and equipment during construction and decommissioning phases or occasionally during project maintenance activities.

Positive impacts on climate are related to the operational phase of the wind farm, as it will contribute to displacing fossil fuels electricity generation with a significant impact on the overall GHG emissions at Country level in Kosovo.

Expected risks from the changing climatic patterns that could affect the project, described below, have been considered, and mitigation measures described.

The most recent analysis of past and future climate change in Kosovo is included in the study “Study on climate change in the Western Balkans region” (Regional Cooperation Council Secretariat Authors: Ana Vuković, PhD and Mirjam Vujadinović Mandić, PhD). The study considers the west Balkan region which includes Albania, Bosnia and Herzegovina, Kosovo, Montenegro, Serbia and North Macedonia.

Average temperature for the whole region in the present climate period (1996-2015) is 10.9°C and has increased by 1.2°C with respect to the past climate period (1961-1980). Annual accumulation of precipitation averaged over the region did not change; the present climate value is 807 mm with 0.2% change relative to the past climate.

Results show that significant temperature increase began during the 1980s. Precipitation has been reducing during the 1980s and 1990s to then begin to increase and returned, in present climate, to the values from the period defined as past climate. This is the reason for a small change of 0.2%.

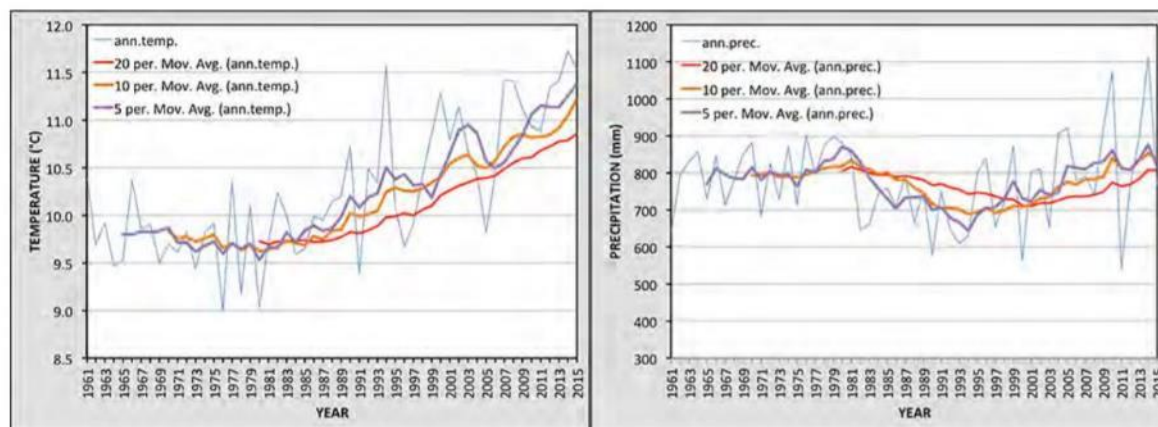


Figure 1: Mean temperature and annual accumulated precipitation averaged over the WB region, and moving averages for 5-yr, 10-yr and 20-yr period, with values assigned to the last year of the averaged period.

Spatial variation of the difference between the present and past climate annual values is presented in Figure 2, together with average 10-year trend slopes. Temperature increase is intensifying from south to north. Over North Macedonia and central and south Albania changes are in the interval from 0.5°C to 1.0°C, and over the north Albania and other four WB economies within the interval 1.0-1.5°C. Average 10-yr trend calculated for the whole 1961-2015 period has similar spatial distribution of intensity of change, with values from 0.15°C to 0.2°C/10yr over the most part of the territory, decreasing towards the south, and increasing mainly over the central part of the region, exceeding the value of 0.2°C/10yr. Spatial distribution of the maximum (T_{max}) and minimum (T_{min}) temperature increase shows more intense T_{max} than T_{min} change in southeast parts of the region, exceeding 1.0°C. However, increase of T_{max} is much higher in northern part of Albania and over the territories of Kosovo*, Montenegro, Bosnia and Herzegovina and Serbia with values in the interval from 1.0°C to 2.0°C. T_{min} increase over this area is mainly 0.5-1.5°C.

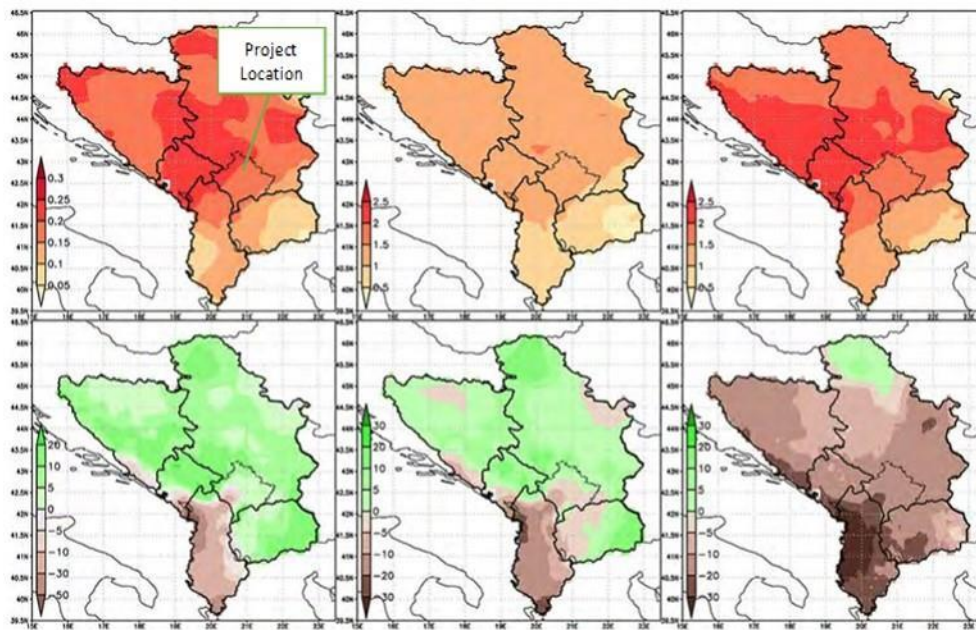


Figure 2: Mean 10-yr trend for the period 1961-2015 (left panels) for temperature (°C) and annual accumulated precipitation (mm), mean temperature (°C) and annual accumulated precipitation (%) change (middle panels) and the same for JJA season (right panels) for pr

To simulate future climates, two Representative Concentration Pathways (RCP) scenarios have been selected, RCP4.5 (stabilization scenario, with GHG emission peak around 2040 and afterwards declining) and RCP8.5 (continuous rise scenario, where GHG concentration continues to increase by the end of the century, known as business-as-usual scenario).

The results of these two scenarios in the West Balkan Region are presented in the figure below (Figure 3) in terms of moving averages for the mean, maximum and minimum temperatures.

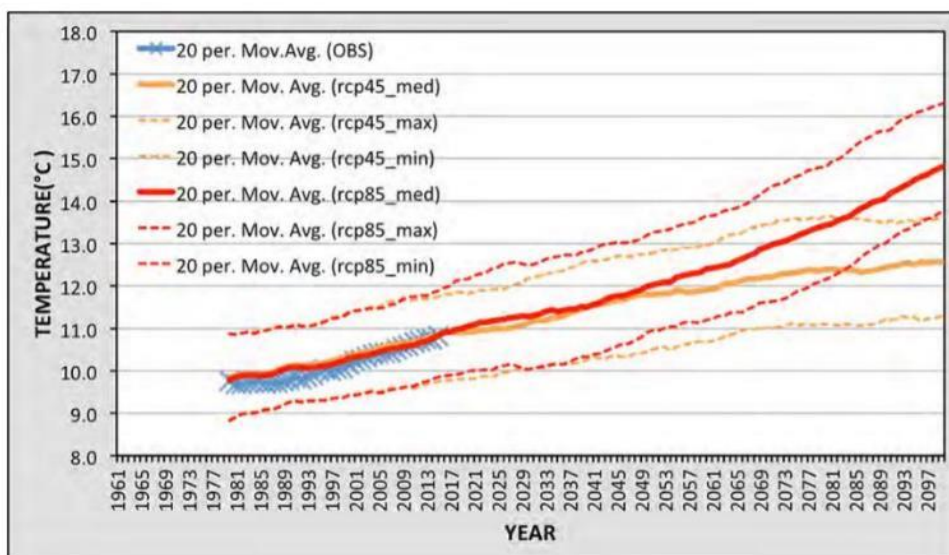


Figure 3: Area averaged mean temperature 20-yr moving average for observed values and model ensemble median, maximum and minimum data according to the RCP4.5 and RCP8.5 scenario; averaged values are assigned to the last year of the 20-yr period.

Considering the expected lifetime of the project as 25 years it is interesting to describe the expected changes in the main climate parameters in the two periods defined as near future and mid-century.

During the near future period (2016-2035) with respect to the baseline period (1986-2005) the expected temperature and precipitation changes are:

- According to the RCP4.5 scenario:
 - Temperature change is significant over the whole region, with average increase of 0.8°C, and seasonally significant change is expected during the JJA and SON, with more significant change in T_{\min} than T_{\max} ;
 - Precipitation change has no significant change in annual nor in seasonal values over the region, mean annual accumulation change is within the -5% and +5% interval, with decrease over the major part of the region during the JJA;
- According to the RCP8.5 scenario:
 - Temperature changes are significant over the whole region with average regional increase of 1.0°C, reaching highest increase during the JJA;
 - Precipitation change shows similar signal as in stabilization scenario, but with somewhat different distribution.

During the mid-century period (2046-2065) with respect to the baseline period (1986-2005) the expected temperature and precipitation changes are:

- According to the RCP4.5 scenario:
 - Mean temperature area averaged increase is 1.6°C, with most pronounced change in JJA and in T_{\max} , within the values between 2.0°C and 3.0°C over the major part of the region;
 - Precipitation change still does not show statistically significant change in mean annual accumulation nor in seasonal values, but the annual values decrease tend to spread over the region, and during JJA the whole region suffers the decrease;
- According to the RCP8.5 scenario:
 - Mean temperature area averaged change is 2.1°C, and spatial analysis shows above 2.0°C over the major part of the region during the most part of the year;
 - Precipitation change decrease becomes significant over Albania and part of Montenegro during JJA and, including North Macedonia but not statistically significant, the values of decrease are over 20%; other seasons and annual values do not show significant change.

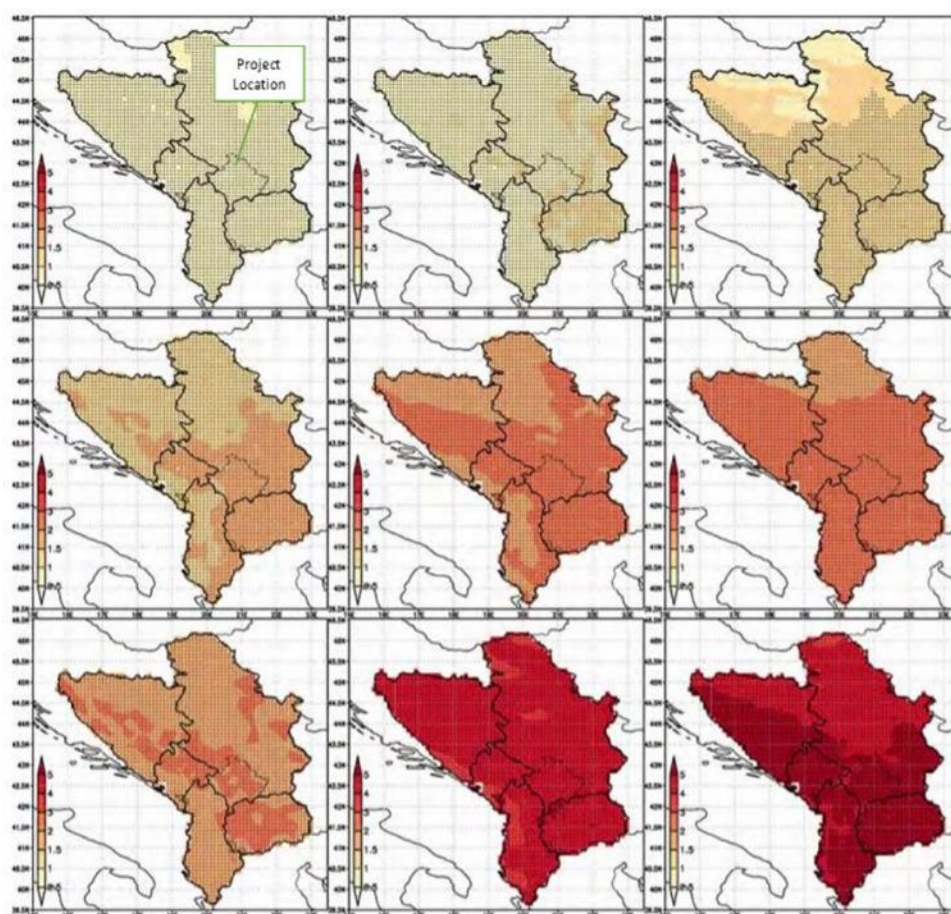


Figure 4: Temperature change (°C) for the near future (top row), mid-century (middle row) and end of the century (bottom row) periods with respect to the baseline period for mean annual values according to RCP4.5 (left), to RCP8.5 (middle) and mean JJA maximum temp

7.1.5.1 Construction phase

7.1.5.1.1 Impact Analysis

The following **project actions** will generate impact factors on climate and climate risks during the construction phase:

- Mobilization of vehicles, workers and equipment, transport of materials and waste;
- Vegetation clearance;
- Surface levelling and grading;
- Construction of the wind turbine foundations;
- Construction of the wind turbines;
- Construction of OHL tower foundations;
- Construction of the OHL towers.

The potential impacts on climate and climate risks deriving from the above actions are associated with the following **impact factor**:

- Emission of greenhouse gases

7.1.5.1.2 Mitigation measures

The mitigation measures listed below will be implemented for the construction phase:

- Ensure that all equipment & vehicles used for maintenance activity are in good condition and are well maintained;
- Ensure that all equipment & vehicles conforms to emission norms.

7.1.5.1.3 Residual impacts

Considering the application of the abovementioned mitigation measures, the impact on climate and climate risks is presented in the following tables and it is expected to be:

- For the WF area: **negligible**;
- For the OHL area: **negligible**.

Table 13: WF area - residual impact assessment matrix for climate and climate risks during construction phase

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|------------------------------|------------------------|-------------------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| Emission of greenhouse gases | Duration: | Medium | Low | Short-term | Negligible | High | Negligible |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Project footprint | | | | | |
| | Intensity: | Low | | | | | |

Table 14: OHL area - residual impact assessment matrix for climate and climate risks during construction phase

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|------------------------------|------------------------|-------------------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| Emission of greenhouse gases | Duration: | Medium | Low | Short-term | Negligible | High | Negligible |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Project footprint | | | | | |
| | Intensity: | Low | | | | | |

7.1.5.1.4 Monitoring

The following monitoring activity will be performed:

- Periodic field inspection. The aim of the inspection is to ensure the implementation of the proposed mitigation measures.

7.1.5.2 Operational phase

7.1.5.2.1 Impact Analysis

Climate

The project will generate electricity without GHG emissions, therefore the positive impacts on climate deriving from the project during operation are associated with the following **impact factor**:

- Greenhouse gas emissions avoidance

The very limited GHG emissions that will come from vehicles used during project maintenance activities that can be considered negligible.

Table 15: WF - impact assessment matrix for climate and climate risks during operational phase

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|-------------------------|------------------------|------------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| GHG emissions avoidance | Duration: | Long | Very high | Long term | Very High | Low | Very High |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Global | | | | | |
| | Intensity: | Negligible | | | | | |

Climate risks

Expected risks from the changing climatic patterns that could affect the project are related mostly to the increased frequency of extreme weather events. The risks identified for the project are the following:

- Increase in days with very high temperatures might affect the functioning of electrical and electronic devices, including the operability of the electrical network in Kosovo;
- Increase in the number of days with heavy precipitations might affect soil stability and increase erosion particularly in the mountainous area;
- Increase of flash floods might damage access roads at water crossing points and increase risks for personnel;
- Increase in thunderstorms might create additional risks to personnel operating in a mountainous environment;
- Increased risk of forest fires and wildfires in general because of extended droughts might affect some WTGs and the transmission line;

7.1.5.2.2 Mitigation/enhancement measures

The mitigation measures listed below will be implemented for the operational phase:

- Prepare an emergency response plan to activate in case of extreme meteorological events, including appropriate training of personnel;
- Avoid working in case of thunderstorms, flash floods or heavy precipitations in order to reduce risks for personnel;
- Prepare a snow related risk management procedure in consultation with local mountain professionals;
- Inspection and check of integrity and functionality of all project structures and infrastructures, including ground stability and effectiveness of stormwater management systems in case of occurrence of such events.

No enhancement measures for the positive impact on climate have been identified.

7.1.5.2.3 Residual impacts

Climate risks

Considering the application of the abovementioned mitigation measures, the impact of changing climatic patterns to the Project is presented in the following tables and it is expected to be:

- For the WF area: **Low**;
- For the OHL area: **Low**.

Table 16: WF area - residual impact assessment matrix for climate and climate risks during operational phase

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|----------------------------|------------------------|--------------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| Changing climatic patterns | Duration: | Medium-short | Medium-high | Short-term | Low | Low | Low |
| | Frequency: | Sporadic | | | | | |
| | Geo. Extent: | Regional | | | | | |
| | Intensity: | Very high | | | | | |

Table 17: OHL area - residual impact assessment matrix for climate and climate risks during operational phase

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|----------------------------|------------------------|--------------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| Changing climatic patterns | Duration: | Medium-short | Medium-high | Short-term | Low | Low | Low |
| | Frequency: | Sporadic | | | | | |
| | Geo. Extent: | Regional | | | | | |
| | Intensity: | Very high | | | | | |

7.1.5.2.4 Monitoring

During the operational phase the implementation and effectiveness of the proposed mitigation measures can be ensured by means of a periodic inspection and check of integrity and functionality of existing structures and infrastructures.

7.1.6 Air quality

This section describes and evaluates the expected impacts on air quality that Project activities might have during construction, operation and decommissioning.

Wind turbines generate electricity without directly emitting air pollutants that are known to affect the climate and human health and reduce air pollution by displacing a more polluting form of electricity generation.

However, wind farms also use electricity and generate pollution when they are built, maintained and then demolished at the end of their life. Therefore, potential air quality impacts are associated with the release of fugitive dust emissions and gaseous pollutants from exhaust gases of vehicles and equipment during construction and decommissioning phases or occasionally during project maintenance activities.

An important aspect to underline is represented by the potential presence of natural occurring asbestos in part of the Wind Farm area. The spatial distribution of asbestos bearing rocks (serpentinized ultramafic rocks) is reported in Section 6.4.2.1 of the Physical baseline (Figure 9). These rocks are located only in part of the WF area (inside and close to the boundary of the geological unit **σJ2-3**); based on information provided by official geological maps and baseline investigations results, outside the boundary of the geological unit **σJ2-3** and along the OHL, no asbestos bearing rocks are expected.

The mitigation measures have been prepared for both areas (WF inside/close unit **σJ2-3** and WF outside unit **σJ2-3/OHL**) and described below in separate sections.

For the WF area inside or close to the boundary of geological unit **σJ2-3**, impacts from airborne asbestos fibres were not quantitatively assessed, due to the lack of site-specific data to characterize the potential emission sources and consequently to develop an air dispersion modelling study, to evaluate air impact in comparison to existing ambient air quality conditions. A specific Natural Occurring Asbestos (NOA) Management Plan has been developed based on existing information following the conclusion of the studies and analysis.

For the WF area outside boundary of geological unit **σJ2-3** and for the OHL area, impacts from dust emissions and mitigation measures have been defined without considering the presence of airborne asbestos fibres, and quantitatively assessed, as reported in the following paragraphs.

Impacts on air quality have been evaluated at potentially affected receptors located close enough to undergo potential adverse impacts. They are mostly isolated farmer houses, except for receptor in Vushtrri located in a residential area and selected for its proximity to the future OHL and the local M2 road. A comprehensive map of receptors has been identified and reported in the Appendixes Section of the present ESIA.

7.1.6.1 Construction phase

7.1.6.1.1 Impact Analysis

The following **project actions** will generate impact factors on the air quality component during the construction phase:

- Mobilization of vehicles, workers and equipment, transport of materials and waste;
- Vegetation clearance;
- Surface levelling and grading;
- Blasting;
- Temporary stockpiling of material;
- Construction of the wind turbine foundations;

- Construction of the wind turbines;
- Construction of OHL tower foundations;
- Construction of the OHL towers;
- Construction of deposit areas.

The potential impacts on air quality deriving from the above actions are associated with the following **impact factors**:

- Emission of dust and particulate matter;
- Emission of gaseous pollutants.

Dust emission has been quantified according to the daily working hours and the expected duration of the single activity and technical data (i.e. amount of material excavated or required for foundation) reported in the Project description (ESIA Chapter 3.0).

The most critical construction phase was then identified for **WF** (outside unit **σJ2-3**) and **OHL** separately, represented by the temporal overlap of several work phases, according to the Project construction works duration, which is assumed to be associated with the maximum dust emission.

The analysis of the Project work schedule highlights the potential worst case, during land levelling and excavation, installation of the OHL and adaptation of access roads for **OHL** area and during construction of WF foundations, adaptation of access roads (including land levelling and excavations for roads) and creation of storage and deposit areas for **WF** area (outside unit **σJ2-3**), as evidenced by the following graph:

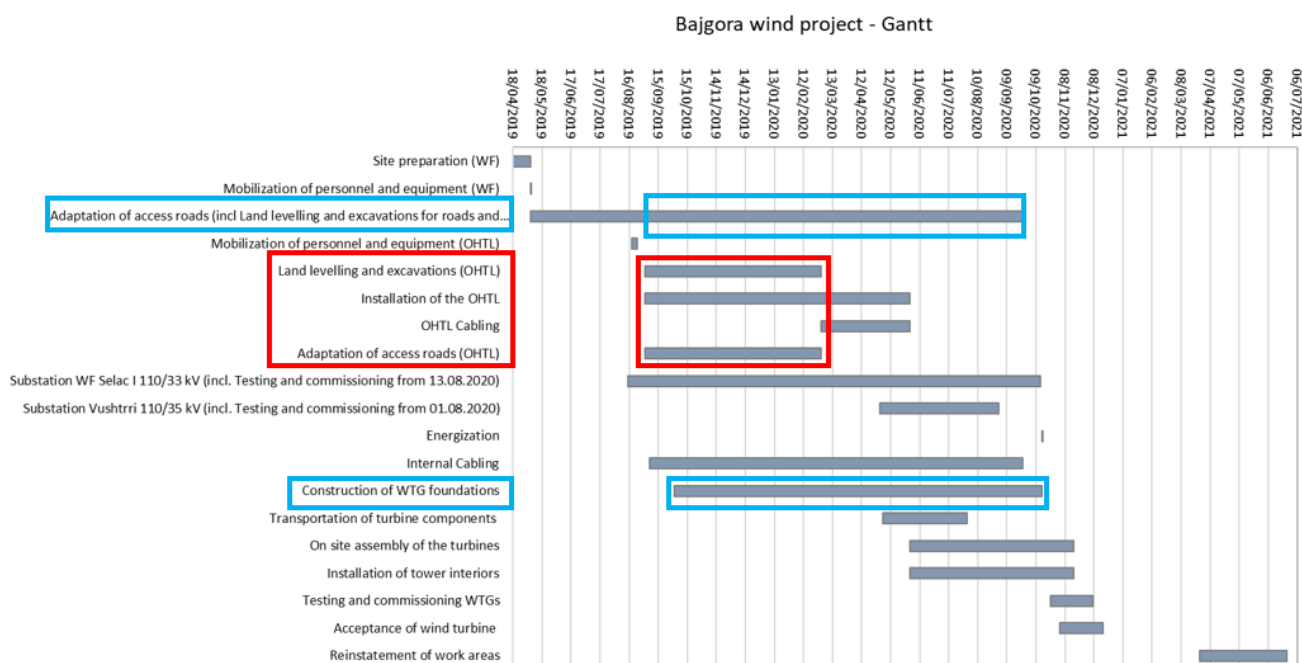


Figure 1: Project Work Schedule and critical construction phases for WF (blue) and OHL (red).

Dust emissions have been quantified using the algorithms recognized and validated by the U.S. Environmental Protection Agency ("USEPA") reported in the document "AP-42 - Development of emission factors for fugitive dust sources". For details with respect to the equations proposed by this methodology, guidelines are available online at the EPA site (<http://www.epa.gov/ttn/chief/ap42>).

Below is the list of activities as defined by USEPA that have been considered significant in terms of dust emission for both areas:

- Overburden removal (Topsoil removal)
- Activities of ground excavation (Soil and rocks excavation / removal);
- Storage piles and wind erosion (wind erosion only for OHL area);
- Transportation of the material on unpaved roads;
- Construction site engines.

Table 28 proposes PM₁₀ emission thresholds considering different receptor distances from the sources and different activities duration (values are expressed in g/h).

Table 18: PM10 emission thresholds (g/h) for different receptor distances and activities duration

| Receptor distance (m) | Duration of the activities (days) | | | | | |
|-----------------------|-----------------------------------|-----------|-----------|-----------|-----------|------|
| | >300 | 300 + 250 | 250 + 200 | 200 + 150 | 150 + 100 | <100 |
| 0 + 50 | 145 | 152 | 158 | 167 | 180 | 208 |
| 50 + 100 | 312 | 321 | 347 | 378 | 449 | 628 |
| 100 + 150 | 608 | 663 | 720 | 836 | 1038 | 1492 |
| >150 | 830 | 908 | 986 | 1145 | 1422 | 2044 |

For **WF** area (outside unit **σJ2-3**) receptors called R8 and R10 have been considered as the most sensitive and closest receptors to future construction activities.

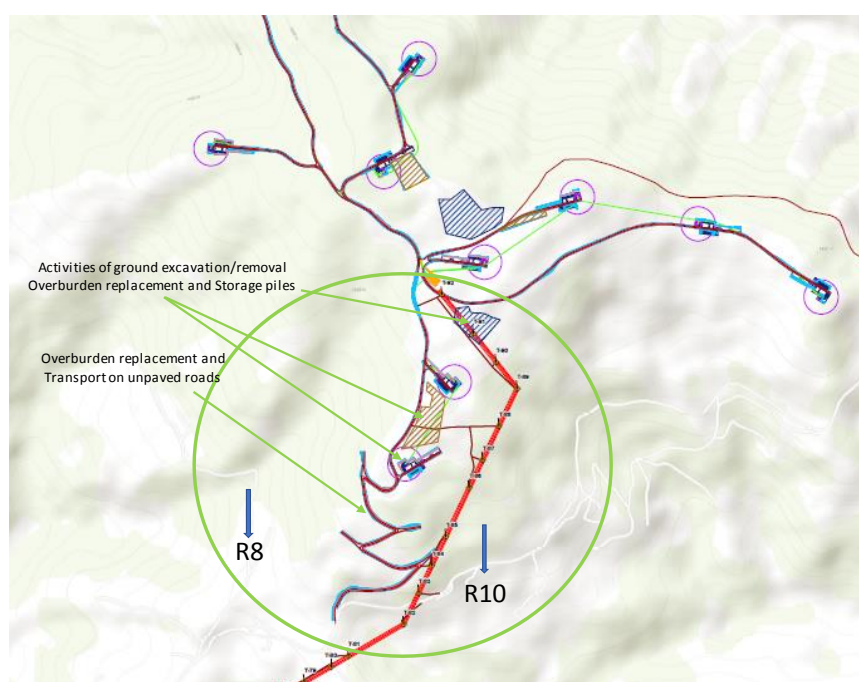


Figure 2: Dust emission sources for WF area outside boundary of geological unit σJ2-3

For **OHL** area receptor called T-10 has been considered as the most sensitive and closest receptor to future construction activities.



Figure 3: Dust emission sources for OHL area

Table 19 presents the PM₁₀ emission rates obtained by applying the equations mentioned above separately for **WF** (outside unit **σJ2-3**) and **OHL** areas.

Table 19: Calculated dust emissions during construction

| Source | WF PM ₁₀ (g/h) | OHL PM ₁₀ (g/h) |
|---|------------------------------|-------------------------------|
| Overburden replacement | 88.39 | 18.95 |
| Activities of around excavation / removal | 66.15 | 1.70 |
| Storage piles | 110.57 | 7.59 |
| Wind erosion | / | 1.39 |
| Transportation of the material on unpaved roads | 427.48 | 13.0 |
| Construction site engines. | 84.3 | 31.2 |
| TOT | 795.17 | 74.1 |

For **WF** area (outside unit **σJ2-3**), R8 and R10 distance from emission sources is at least 200 m, so the PM₁₀ emission threshold, considering 100÷150 days of activities, is 1422 g/h. The estimated emission rate is below the thresholds listed in Table 28.

For **OHL** area, T10 distance from emission sources is less than 50 m, so the PM₁₀ emission threshold, considering less than 100 days of activities, is 208 g/h. The estimated emission rate is below the thresholds listed in Table 28.

The emissions of gaseous pollutants in the atmosphere from diesel engines of the vehicles engaged in construction activities must be considered as well as exhaust gases of heavy vehicles used to transport material

at the site. Emissions resulting from these activities are carbon monoxide ("CO"), volatile organic compounds ("VOC") and nitrogen oxides ("NOx"), in addition to dust/particulate matter ("PM"), already considered in the above-mentioned dust emission quantification.

The methodology to assess the impact of exhaust gases of heavy vehicles during the construction phase involves use standard emission factors (SCAB Fleet Average Emission Factors 2016); these factors indicate the specific emission of pollutants (CO, VOC and NOx) for different categories of industrial vehicles. An estimation of the emissions generated by the construction site vehicles is obtained multiplying the emission factors by the number of operating vehicles at Site, according to the daily working hours and the expected duration of the single activity and technical data.

Table 20 showing the gaseous emission rates obtained by applying the abovementioned procedure.

Table 20: Calculated gaseous emissions during construction

| Area | CO (ton/year) | VOC (ton/year) | NOx (ton/year) |
|------|------------------|-------------------|----------------|
| WF | 2.60 | 0.48 | 3.24 |
| OHL | 1.42 | 0.27 | 1.83 |

The power plants and cement manufacturing in Kosovo are the main sources of CO and NOx. As an example, excluding Kosovo A and B plants, other industries are contributors of NOx for estimated 8,860 tons a year (MEM 2010). Considering the amount of gaseous emission calculated above, the contribution of construction works is extremely low compared to the available reference values.

7.1.6.1.2 Mitigation measures

For WF area inside/close boundary of geological unit **σJ2-3**, mitigation measures are those reported in detail in the NOA Management Plan.

For WF area outside geological unit **σJ2-3** and for OHL area, estimated dust and gaseous pollutants emission rates are below the thresholds indicated by the USEPA. Anyhow, the following mitigation measures as good industry practices to minimize air pollution will be implemented:

- Use of water suppression to reduce dust emissions from the transport of material on unpaved road. Considering for example a quantity of water equals to 1 l/m² and an interval between two applications of 9 hours for an average hourly traffic values below 5, the estimated efficiency of the water suppression can be considered equal to 90%;
- Restriction of the speed limit of vehicles within the construction area;
- Use tarpaulins to cover material that is transported to and from the site by truck;
- Clean wheels of haul trucks prior to leaving construction area;
- Avoid unnecessary traffic.

Reduction of emission of pollutants from vehicles and equipment:

- Ensure that all equipment & vehicles used for construction activity are in good condition and are well maintained;
- Ensure that all equipment & vehicles conform to emission and noise norms.

7.1.6.1.3 Residual impacts

Considering the application of the abovementioned mitigation measures, the impact on air quality is presented in the following tables and it is expected to be:

- For the WF area: **low**;
- For the OHL area: **negligible**.

Table 21: WF area - residual impact assessment matrix for air quality component during construction phase

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|--|------------------------|----------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| Emission of dust and particulate matter (inside unit σJ2-3) | Duration: | Medium | Very high | Short-mid-term | Medium | High | Negligible |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | High | | | | | |
| Emission of dust and particulate matter (outside unit σJ2-3) | Duration: | Medium | Medium-low | Short-mid-term | Low | High | Negligible |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Low | | | | | |
| Emission of gaseous pollutants | Duration: | Medium | Medium-low | Short-term | Negligible | Low | Negligible |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Low | | | | | |

Table 22: OHL area - residual impact assessment matrix for air quality component during construction phase

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---|------------------------|----------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| Emission of dust and particulate matter | Duration: | Short | Medium-low | Short-mid-term | Negligible | High | Negligible |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Low | | | | | |
| Emission of gaseous pollutants | Duration: | Short | Medium-low | Short-term | Negligible | Low | Negligible |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Low | | | | | |

7.1.6.1.4 Monitoring

The following monitoring activities will be performed to ensure the implementation and effectiveness of the proposed mitigation measures:

- Production of a specific Monitoring Plan of airborne asbestos fibres to be implemented during blasting and excavation/levelling activities in areas characterized by the potential presence of naturally occurring asbestos;
- Periodic visual inspection and maintenance of permanent deposit areas. The aim of the inspection is to verify the integrity of the capping and the containment of asbestos bearing material.

7.1.6.2 Operational phase

7.1.6.2.1 Impact Analysis

Wind farm is a renewable energy technology that does not involve any burning of fossil fuels therefore no pollutants emissions are predicted during operational phase.

Wind farm just requires rather low maintenance that results in low frequency check of the O&M staff and consequently in very limited air emissions from exhaust of vehicles used during project maintenance activities, that can be considered negligible. Furthermore, dust emissions could be linked to vehicle traffic and wind erosion from exposed rocks and soils. Exposed rocks and soils in areas of geological unit **σJ2-3** might generate airborne asbestos fibres.

7.1.6.2.2 Mitigation measures

Mitigation measures during operational phase consist in:

- the proper maintenance of the deposit area and other asbestos containing rocks exposed areas. A remedial restoration protocol will be developed to ensure a prompt coverage of the damaged areas detected by visual inspections (see monitoring below).
- Avoidance of off-road vehicular traffic to prevent dust production and accelerated erosion phenomena that may increase exposure and wind erodibility of asbestos bearing materials.

Reduction of emission of pollutants from vehicles and equipment:

- Ensure that all equipment & vehicles used for construction activity are in good condition and are well maintained;
- Ensure that all equipment & vehicles conform to emission and noise norms.

7.1.6.2.3 Residual impacts

Considering the application of the abovementioned mitigation measures, the impact on air quality component is presented in the following tables and it is expected to be:

- For the WF area: **negligible**;
- For the OHL area: **negligible**.

Table 23: WF area - residual impact assessment matrix for air quality component during operational phase

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---|------------------------|-------------------|-----------------------|---------------------------------|-------------------|--------------------------|-----------------------|
| Emission of dust and particulate matter | Duration: | Short | Low | Short-term | Negligible | High | Negligible |
| | Frequency: | Sporadic | | | | | |
| | Geo. Extent: | Project footprint | | | | | |
| | Intensity: | Negligible | | | | | |
| Emission of gaseous pollutants | Duration: | Short | Low | Short-term | Negligible | Low | Negligible |
| | Frequency: | Sporadic | | | | | |
| | Geo. Extent: | Project footprint | | | | | |
| | Intensity: | Negligible | | | | | |

Table 24: OHL area - residual impact assessment matrix for air quality component during operational phase

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---|------------------------|-------------------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| Emission of dust and particulate matter | Duration: | Short | Low | Short-term | Negligible | High | Negligible |
| | Frequency: | Sporadic | | | | | |
| | Geo. Extent: | Project footprint | | | | | |
| | Intensity: | Negligible | | | | | |
| Emission of gaseous pollutants | Duration: | Short | Low | Short-term | Negligible | Low | Negligible |
| | Frequency: | Sporadic | | | | | |
| | Geo. Extent: | Project footprint | | | | | |
| | Intensity: | Negligible | | | | | |

7.1.6.2.4 Monitoring

During the operation phase the implementation and effectiveness of the proposed mitigation measures can be ensured by means of a periodic inspection and maintenance of permanent deposit areas. The aim of the inspection is to verify the integrity of the capping and the containment of asbestos bearing material.

7.1.7 Noise and vibrations

In October 2018, UL International GmbH has prepared a noise propagation model to calculate the expected noise impact of the wind farm at the nearby receptor locations (RL) and compare the resulting noise levels to IFC guideline values.

The calculated expected sound pressure levels do not exceed the IFC night-time limit (45 dB) and fall below the day-time limit (55 dB) by at least 10 dB.

A complete description of the noise propagation model and results are included in the Appendixes Section of the present ESIA (Ref. 181010_UL DEWI_Selac_Noise Estimation Report).

In June 2019, a specific phonometric survey has been carried out by GR Albania for the identified sensitive receptors of the WF and OHL areas. A complete description of the applied procedures, field activities and results are included in the Appendixes Section of the present ESIA.

Twenty-four hours noise measurements have been done at the **4** most sensitive receptors in the **WF** area, while 3-15 minutes day-time measures have been done for **5** most sensitive receptors of the **OHL**.

The noise monitoring assessment provided the following results:

WF Area

Comparing the day-time monitoring results at the sensitive receptors with the IFC limit of 55 dB (A), all the receptors are within the limit. Comparing the night-time monitoring results at the sensitive receptors with the IFC limit of 45 dB (A), all the receptors are within the limit except for the receptor coded RL 10 with a result of 52,2 dB(A), exceeding the limit for 7,2 dB(A). The same receptor as per the day-time monitoring result, is within the day-time allowed value but still close to it, with a result of 54,9 dB(A) compared to the limit of 55 dB(A).

OHL Area

Comparing the noise monitoring results of the sensitive monitored receptors with the IFC limit of 55 dB (A), all the receptors are within the limit except for the receptor coded T-10 which is close to Vushtri with a difference of 5 to 8 dB (A) more than the allowed norm (IFC limit of 55 dB (A)). The results of the receptor T-10 were expected to be higher as it is a residential area.

This section describes and evaluates the expected impacts due to Project activities that might have impact on noise component including construction, operational and decommissioning phase, combining results from noise propagation calculation and noise monitoring assessment.

A complete description of noise impact assessment and mitigation measures are included in in the Appendixes Section of the present ESIA.

Impacts on noise have been evaluated at potentially affected receptors located close enough to undergo potential adverse impacts. They are mostly isolated farmer houses, except for receptor in [Vushtrri](#) located in a residential area and selected for its proximity to the future OHL and the local M2 road. A comprehensive map of receptors has been identified and reported in the Appendixes Section of the present ESIA.

7.1.7.1 Construction phase

7.1.7.1.1 Impact Analysis

The following **project actions** will generate impact factors on noise during the construction phase:

- Mobilization of vehicles, workers and equipment, transport of materials and waste;
- Vegetation clearance;
- Surface levelling and grading;
- Blasting;
- Construction of the wind turbine foundations;
- Construction of the wind turbines;
- Construction of OHL tower foundations;
- Construction of the OHL towers;
- Construction of deposit areas.

The potential impacts on air quality deriving from the above actions are associated with the following **impact factor**:

- Emission of noise and vibrations.

All the construction activities onsite will be performed during daytime for both WF and OHL areas. The construction phase is likely to generate noise due to equipment used for construction activities and traffic related to vehicles to and from the Site.

WF Area

Comparing the daytime monitoring results at the sensitive receptors with the IFC limit of 55 dB (A), all the receptors are within the limit. The potential noise impact due to construction activities compared to the current state is expected to be lower than during operational phase (construction activity due to its nature is a temporary activity and thus any impacts will be short term typically). Considering that the noise impact during operational phase (as will be shown in the following paragraph 7.6.8.2 Operational phase), calculated at the receptors as sum of contribution due to the aerodynamic noise from wind turbines and the daily noise measured level, is compliance with IFC daily limit and the maximum tolerated increase of 3 dB, potential noise impact due to construction activities is expected to be compatible with IFC daily limits during the construction phase.

OHL Area

Comparing the noise monitoring results of the sensitive monitored receptors with the IFC limit of 55 dB (A), all the receptors are within the limit except for the receptor coded T-10. The same considerations made for the WF area can be considered valid. For receptor T-10, that shows at the current state a non-compliant situation, some mitigation measures must be considered in order not worsen the current situation.

7.1.7.1.2 Mitigation measures

The mitigation measures that will be implemented for the construction phase for the entire Project area are:

- Construction activities must be limited to between 08:00 to 20:00 every working day.
- Equipment and technology with generation of low noise levels must be selected where possible.
- Noise generating equipment must be located as far as possible from local noise sensitive areas identified.
- Temporary barriers or screens should be erected if necessary, around noisy equipment such as generators and compressors.
- Operators of all mobile equipment must be instructed to avoid unnecessary revving of machinery.
- Use of modern and well-maintained mobile equipment must be ensured.
- Additional measures might be required based on (i) feedback from stakeholders, directly or through the grievance mechanism, and (ii) consultation with the management of sensitive sites (schools, hospitals, religious/cult sites) potentially located in the vicinity of the OHL. These measures will be discussed and agreed on a case by case basis with affected stakeholders.

7.1.7.1.3 Residual impacts

Considering the application of the abovementioned mitigation measures, the impact on noise and vibrations component is presented in the following tables and it is expected to be:

- For the WF area: **negligible**;
- For the OHL area: **negligible**.

Table 25: WF area - residual impact assessment matrix for noise and vibrations component during construction phase

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|----------------------------------|------------------------|----------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| Emission of noise and vibrations | Duration: | Medium | Medium-high | Short-term | Low | Medium | Negligible |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Medium | | | | | |

Table 26: OHL area - residual impact assessment matrix for noise and vibrations component during construction phase

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|----------------------------------|------------------------|--------------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| Emission of noise and vibrations | Duration: | Medium-short | Medium-high | Short-term | Low | Medium | Negligible |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Medium | | | | | |

7.1.7.1.4 Monitoring

The following monitoring activities will be performed:

- Periodic field inspection. The aim of the inspection is to ensure the implementation of the proposed mitigation measures;
- A noise monitoring campaign will be performed to monitor accurately the acoustic impact of construction phase and effectiveness of the proposed mitigation measures.

7.1.7.2 Operational phase

7.1.7.2.1 Impact Analysis

The following **project actions** will generate impact factors on the air quality component during the operational phase:

- Operation and maintenance of the WF.

The potential impacts on air quality deriving from the above actions are associated with the following **impact factors**:

- Emission of noise and vibrations.

The IFC states that noise impacts should not exceed the levels presented in **Table 2** or result in a maximum increase above background levels of 3 dBA at the nearest receptor location off-site (IFC, 2007).

Table 27: World Bank noise limits, Laeq in dB(A)

| Noise Levels Guidelines | | |
|---|-------------------|---------------------|
| Area | Day (07:00-22:00) | Night (22:00-07:00) |
| Residential, institutional, educational | 55 | 45 |
| Industrial, Commercial | 70 | 70 |

WF Area

Based on the prediction noise levels at the receptors (Ref. 181010 UL DEWI Selac Noise Estimation Report) and the background noise levels (Ref. GR Albania Noise Monitoring Assessment), the respect of the foreseen limits at receptors RL8, RL 10, RL11 and RL 12, has been assessed on two different phases:

Day-time first phase verification (compliance with the limit of 55 dB).

The noise impact at the receptor is calculated applying the logarithmic sum of the model prediction level and the daily noise measured level at the receptor.

| Receptor | Model result | Measured result (Daytime) | Final result | | Limit (dB) | Verification |
|----------|--------------|---------------------------|--------------|---------|------------|--------------|
| | | | Calculated | Approx. | | |
| RL8 | 43.1 | 53.5 | 53.87 | 54 | 55 | YES |
| RL10 | 43.8 | 54.9 | 55.22 | 55 | 55 | YES |
| RL11 | 44.7 | 53.5 | 54.03 | 54 | 55 | YES |
| RL12 | 43.6 | 48.2 | 49.49 | 49 | 55 | YES |

Figure 4: First check results Day-time

As shown in the table above all the calculated results are within the IFC noise limit of 55 dB.

Day-time second phase verification (compliance with max. increase of 3 dB).

The second check has been applied to understand if the noise impact is within the 3 dB as a maximum increase in background level at the receptors. This check consists on the arithmetic difference between the calculated result (first phase) and the daily measured result.

| Receptor | Model result + Measured result (Daytime) | Measured result (Daytime) | Final result | | Limit (dB) | Verification |
|----------|--|---------------------------|--------------|---------|------------|--------------|
| | | | Calculated | Approx. | | |
| RL8 | 53.87 | 53.5 | 0.37 | 0.4 | 3 | YES |
| RL10 | 55.22 | 54.9 | 0.32 | 0.3 | 3 | YES |
| RL11 | 54.03 | 53.5 | 0.53 | 0.5 | 3 | YES |
| RL12 | 49.49 | 48.2 | 1.29 | 1.3 | 3 | YES |

Figure 5: Second check results Day-time

As shown in the table above all the calculated results are within the 3 dB of limit.

Night-time first phase verification (compliance with the limit of 45 dB).

The same procedure has been followed for the night-time period.

| Receptor | Model result + Measured result (Night-time) | Measured result (Night-time) | Final result | | Limit (dB) | Verification |
|----------|---|------------------------------|--------------|---------|------------|--------------|
| | | | Calculated | Approx. | | |
| RL8 | 43.1 | 44.4 | 46.80 | 47 | 45 | NO |
| RL10 | 43.8 | 52.2 | 52.78 | 53 | 45 | NO |
| RL11 | 44.7 | 45.1 | 47.91 | 48 | 45 | NO |
| RL12 | 43.6 | 34.4 | 44.09 | 44 | 45 | YES |

Figure 6: First check results Night-time

As shown in **Figure 6** most of the calculated results are above the IFC noise limit of 45 dB during the night-time monitoring except of the RL12 receptor.

Night-time second phase verification (compliance with max. increase of 3 dB).

The same procedure has been followed for the night-time period.

| Receptor | Model result + Measured result (Night-time) | Measured result (Night-time) | Final result | | Limit (dB) | Verification |
|----------|---|------------------------------|--------------|---------|------------|--------------|
| | | | Calculated | Approx. | | |
| RL8 | 46.80 | 44.4 | 2.4 | 2.5 | 3 | YES |
| RL10 | 52.78 | 52.2 | 0.58 | 1 | 3 | YES |
| RL11 | 47.91 | 45.1 | 2.81 | 3 | 3 | YES |
| RL12 | 44.09 | 34.4 | 9.69 | 10 | 3 | NO |

Figure 7: Second check results Night-time

The verification process is positive as most of the values are within the 3 dB limit except for the RL12 receptor.

OHL Area

The OHL during operational phase just requires rather low maintenance that results in low frequency check of the O&M staff and consequently in very limited noise emissions that might come from equipment used occasionally during project maintenance activities that can be considered negligible.

7.1.7.2.2 Mitigation measures

The mitigation measure that will be implemented for the operational phase for the wind farm area is:

- A more precise noise propagation model will be performed in order to better detail the noise levels simulated at any sensitive receptor, according to site-specific atmospheric conditions (different wind directions and wind speed classes) and reviewed model input data such as different operation modes resulting in different sound power levels of the wind turbines (L_{WA}) determined for different classes of wind speed; if new simulations should confirm actual results or planned noise measures during operational phase should validate the current estimated noise impact, it will be necessary to consider to turning off a combination (one or two or all) of wind turbines (I-01, I-02 and I-06) closest to receptors RL8, RL10, RL11 and RL12 during night-time (from 22:00 to 07:00). For RL8 and RL12 receptors, the application of this approach, could mean to be compliance with IFC limits (nocturnal limit and max. allowed increase in background levels of 3 dB). For RL10 and RL11 receptors, that have shown measures results above IFC limit, this mitigation measure allows not worsen the current noise state.

7.1.7.2.3 Residual impacts

Considering the application of the abovementioned mitigation measures, the impact on noise and vibrations component is presented in the following tables and it is expected to be:

- For the WF area: **low**;
- For the OHL area: **negligible**.

Table 28: WF area - residual impact assessment matrix for noise and vibrations component during operational phase

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|----------------------------------|------------------------|------------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| Emission of noise and vibrations | Duration: | Long | Medium-high | Short-mid-term | High | Medium-high | Low |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Regional | | | | | |
| | Intensity: | Very high | | | | | |

Table 29: OHL area - residual impact assessment matrix for noise and vibrations component during operational phase

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|----------------------------------|------------------------|-------------------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| Emission of noise and vibrations | Duration: | Short | Medium-high | Short-term | Negligible | Low | Negligible |
| | Frequency: | Sporadic | | | | | |
| | Geo. Extent: | Project footprint | | | | | |
| | Intensity: | Negligible | | | | | |

7.1.7.2.4 Monitoring

The following monitoring activity will be performed:

- a noise monitoring plan to be developed according to site atmospheric conditions and corrected for background speeds (in accordance with international noise standards) to monitor accurately the acoustic impact of wind farm at any potentially sensitive receptor, validate the current estimated noise impact at the receptors and evaluate effectiveness of the proposed mitigation measures. If during operation, exceedance of limits should be detected at receptors, mitigation measures will be evaluated case by case, based on

the kind of exceedance (IFC night time limit value or no compliance with max.increase in 3 dbA). Potential measures include improving insulation of receptors (doors and windows), positioning of noise screens.

7.2 Assessment of the impacts for biological components

The impact assessment for biodiversity follows the semi-quantitative method described in the Impact Assessment Methodology Chapter 5, which is very briefly summarized again here.

Project actions, resulting impact factors and biodiversity components potentially affected have been outlined in Chapter 5 and are explored more below. An impact value for an impact factor affecting a biodiversity feature is calculated by summing scores for impact criteria, such as duration and intensity, and multiplying by the sensitivity of the biodiversity feature. The sensitivity scale is given in the IA Methodology Chapter and Sensitivity rankings have been provided at the end of the Biodiversity baseline (Chapter 6B). Priority Biodiversity Features (PBFs) and Critical Habitats (CHs) identified within the LSA are triggered by different habitats, flora and fauna species but also by other significant biodiversity features, such as an Important Bird Area (IBA).

The sensitivity of the various biodiversity components is defined in the baseline section as follows:

- the general sensitivity of the component is considered to be:
 - for the Wind Farm LSA: Medium;
 - for the Powerline LSA: Low;
- Natural habitats and PBFs are considered having a Medium sensitivity;
- Critical Habitats CHs are considered having a High sensitivity.

Impacts on general biodiversity, including flora fauna and habitats, are assessed in section 7.2.1 for the construction phase and in section 7.2.2 for the operation phase. During the operation phase the residual impacts of the wind farm were considered separately for birds and bats due to the specific impacts and mitigation measure planned for this sub-components.

Specific impacts on Key Biodiversity Features, including Natural Habitats, Priority Biodiversity Features and Critical Habitats are discussed in depth in section 7.2.3 for the construction and operation phases. Additional specific mitigation and monitoring measures are presented in this section.

A No Net Loss /Net Gain Assessment is performed in section 7.2.4 for those Key Biodiversity Features that could still have residual and unavoidable impacts even considering the application of additional mitigation measures.

The conclusions of the impact assessment for the biological components are summarized in section 7.2.5.

7.2.1 Construction phase

7.2.1.1 Impact Analysis

The potential impacts on biodiversity are associated with the following impact factors:

- 1) vegetation and topsoil removal;
- 2) changes in local hydrology;
- 3) increase in vehicular traffic;
- 4) emission of noise and vibration;
- 5) introduction and spreading of alien species.

All the impact factors identified above are described and discussed in the following assessment.

- 1) Vegetation and topsoil removal:

Construction works will cause direct habitat loss and habitat fragmentation. The removal of vegetation causes the destruction of suitable habitats for fauna species that use the vegetation present as food, shelter or nesting site.

Flora species present in the area will be directly impacted by vegetation clearing at the beginning of construction during ground preparation works.

Local fauna could be directly impacted by the vegetation clearing and soil disturbance activities performed during site preparation. Species characterized by low mobility (such as reptiles and amphibians) may not be able to move ahead of construction. Species with a hiding strategy to escape predators might also be accidentally killed during the construction operations. Nesting sites could be destroyed by vegetation clearing with different effects depending on timing and the species reproduction strategy. In forest areas, bats in maternity or hibernating might not be able to escape from vegetation clearing activities.

Vegetation present within footprint of the construction sites and associated facilities will be cleared and the topsoil will be removed, ground will be excavated, excavated materials will be moved to storage areas, ground will be flattened and compacted in order to create a suitable ground for construction.

The areas affected by this impact factor will be limited to the Project footprints, including Project foundations under wind turbines, the substation, including the transformer, the switchyard and the administrative buildings, the access roads and temporary facilities present during the construction phase.

A corridor of 8+8 meters will be kept around the OHL in the long term, directly impacting the habitat only in the forest areas for easier construction and maintenance during the operation. Access roads to the powerline of the OHL will also be constructed existing roads.

2) Changes in local hydrology:

Construction activities such as surface levelling and grading, and the decreased permeability of the areas where concrete will be laid (foundations + various platforms) will cause changes in local morphology and hydrology.

Within the LSA were also identified during field surveys 51 wet sources dividing in 40 natural springs, 2 small wetlands, 4 wells and 5 small fountains (see, Figure 6).

Of the total sources mentioned above, 2 natural springs (SP27, SP36) are directly impacted by the WF footprint. Additionally, 8 natural springs (SP05, SP06, SP07, SP11, SP19, SP25, SP31, SP33) and 2 small wetlands (WL01, WL02) are indirectly impacted by the WF footprint within a 100m buffer, while others sixteen natural springs (SP08, SP09, SP10, SP13, SP24, SP26, SP28, SP29, SP30, SP32, SP34, SP35, SP37, SP38, SP39, SP40) are indirectly impacted within a 300m buffer.

None of the wet sources are directly impacted by the OHL footprint. However, 1 natural springs (SP16) and 1 small fountains (SP02) are indirectly impacted by the OHL footprint within a 100m buffer, while 3 natural springs (SP17, SP18, SP20), 3 small fountains (SP01, SP03, SP04) and 1 well are located within the 300m buffer and might be impacted.

Using a precautionary approach, it is considered that local morphology and hydrology could be locally affected, especially in relation to road and platforms construction.

Some springs have been identified during the early construction works and could be affected by changes in morphology. Fauna species, especially invertebrate fauna in the springs, could be impacted by pollution.

Using a precatory approach, a 100 m buffer is considered around internal and external roads.

3) Increase in vehicular traffic:

During construction, an increase in vehicular traffic is expected within the construction site and the different project facilities. In addition, construction and improvement of access roads may lead to increases in average vehicle speeds. Therefore, accidental collisions with wildlife might occur.

Increased vehicular traffic may result in direct mortality for fauna species and indirect habitat degradation. Road kills can have a significant impact on some wildlife populations. Animals subject to roadkill are attracted to roads for a variety of reasons.

More in general, traffic can have an important influence on the behaviour of wildlife and on its distribution, thus the use of the space, of local populations (Sr. Clair and Forrest, 2009). As an example:

- Amphibians might be attracted by stagnant water that forms at roadside or within the construction area.
- Reptiles and other ectotherms go there to bask in the sun, some birds use roadside gravel to aid their digestion of seeds.
- Songbirds come to dust bathe on dirt roads, where they are vulnerable to vehicles as well as predators. Vultures, crows, foxes and other scavengers seek out roadkill and often become roadkill themselves.
- Mammals might be attracted by organic waste or to de-icing salts, browsing herbivores are attracted to the vegetation of roadside edge, rodents proliferate in the artificial grasslands of road verges, and many large mammals find roads to be efficient travel ways.

Using a precautionary approach, a 300 m buffer is considered around internal and external roads.

4) Emission of noise and vibration:

The emission of noise and vibration is expected to be of high intensity for the wind farm construction. Construction activities such as vegetation clearance, surface levelling and grading, blasting, excavation of construction material, transport and temporary stockpiling of material, construction of the facilities are expected to generate noise and vibration.

The emission of noise and vibration could cause indirect habitat degradation due to temporary avoidance of surrounding areas by sensitive fauna species. Disturbance from anthropogenic noise, for example, is known to be correlated with reduced densities of breeding birds (Reijnen *et al.*, 1995; Canaday and Rivadeneyra, 2001).

Noise has the greatest effect on wildlife that relies heavily on auditory signals for survival and especially on birds and mammals. The effects of vibration on wildlife is poorly studied, however avoidance behaviour around the source of vibration is likely to exist for birds, reptiles and amphibians. Birds and reptiles are highly sensitive to vibration (e.g., Shen 1983), which low-frequency noise can be a source of information about approaching predators and prey. Also, amphibians have exquisite sensitivity to vibration (Lewis and Narins 1985): there are species that use low-frequency acoustic cues detected via ground vibrations to communicate, to time their emergence from burrows (Dimmittand Ruibal 1980).

An impact could be expected especially during the breeding period on birds and mammals, which may be frightened by noise and might abandon their nest /mating ground. In particular, the breeding period for bird species in the area ranges from April to July, with a peak period from May to June.

During the construction phase, most fauna species may temporarily avoid wind farms and, according to Helldin *et al.* (2012), this behaviour is mainly due to the increase in human activity. However, this phase is generally short in time and when construction and human presence is removed, animals acclimate to wind energy infrastructure (Łopucki and Mróz, 2016).

Sudden and discontinuous loud noises like rock blasting may cause an adverse response in many fauna species present in the surroundings of the construction site.

Preliminary results of a wolves' study at a portuguese wind farm show that this species avoid the area during the construction phase (Alvares *et al.*, 2011), but the effect is limited to a single year.

At the construction of Hitra wind farm on Eldsfjellet in Norway, there were some indications that red deer stags temporarily left the area closest to the wind farm (Veiberg & Pedersen, 2010). Walter *et al.* (2006) describes some impact on north american elk from the wind farm during construction, however the individuals did not shift home ranges and no effects on population level could be noted.

A study of Wallin (1998) suggests, also for black bears, a certain avoidance during construction and, according to Arnett *et al.* (2007), an avoidance during this phase can be expected also in species such as mule deer, white-tailed deer and pronghorn.

In addition, results from the Norwegian project VindRein, that has been running since 2005, show that during construction phase the reindeer avoided wind farms in open terrain such as mountain areas. However, they subsequently came back to graze within the wind farms (Colman *et al.* 2008).

The effects of noise disturbance from human activity on wildlife are mostly perceived over short distances in a species- specific way (up to ~ 300 m, Reijnen *et al.*, 1995; Canaday and Rivadeneyra, 2001). Therefore, using a precautionary approach, a 300 m buffer is considered around Project components, associated facilities and temporary facilities present during construction.

5) Introduction and spreading of alien species:

The presence of new roads may always induce other impact factors, among them the long-term possibility to get allochthonous seeds/insects from outside. Especially during roadworks, where heavy trucks coming from outside the study area can climb off road areas by 4X4 vehicles, the risk of getting undesired seeds is relevant.

Removal of natural vegetation cover and soil disturbance could facilitate the spreading of invasive alien (non-native) species accidentally introduced. These species tend to have an advantage in disturbed ecosystems, and if they penetrate into a habitat, they can potentially change its functionality and species composition, including priority biodiversity species. Local fauna that depend on those ecosystems could also be indirectly affected.

The habitats around the construction sites could experience a decrease in biodiversity in the immediate vicinity of the roads, with a consequent trivialization (potential appearance of more dominant species) of the ecosystem in a small buffer area close to the roads with a higher traffic.

Using a precautionary approach, a 100 m buffer around the Project facilities is considered for this impact factor.

Direct impacts of the wind farm from vegetation clearing and disturbance of terrestrial topsoil will impact less than 1% of the total LSA. All the direct impacts will be mainly concentrated on mountain pastures (E1.7, about 1% of the total habitat present in the LSA). The project will largely make use of existing access roads and adjacent areas, that have a higher level of degradation than the average in the LSA, and as such will minimize further habitat destruction/degradation.

In addition, direct impacts of the OHL will impact less than 1% of the total LSA. All the direct impacts will be mainly concentrated on oak forests (G1.762, 3% of the total habitat present in the LSA).

Indirect impacts in the 100 m buffer deriving from the wind farm, such as changes in morphology and hydrology, increase in vehicular traffic and introduction of invasive alien species, could impact a total of 5% of the LSA. Indirect impacts from the wind farm in the 100 m buffer will be mainly on mountain pastures (E1.7, 8% of the total habitat present in the LSA) and beech coppice forests (G1.691 coppice, 3% of the total habitat present in the LSA).

In addition, indirect impacts in the 100 m buffer deriving from the OHL could impact a total of 5% of the LSA, mainly impacting on fields (I1.3, 34% of the total habitat present in the LSA), mountain pastures (E1.7, 2% of the total habitat present in the LSA) and coppice forests (G1.762, 35% of the total habitat present in the LSA).

Indirect impacts in the 300 m buffer deriving from the wind farm, such as noise and vibration, could impact a total of 13% of the LSA. Indirect impacts from the wind farm within the 300 m buffer will be mostly on mountain pastures (E1.7, 18% of the total habitat present in the LSA) and beech coppice forests (G1.691 coppice, 8% of the total habitat present in the LSA).

In addition, indirect impacts in the 300 m buffer deriving from the OHL could impact a total of 12% of the LSA., mostly on fields (I1.3, 96% of the total habitat present in the LSA), oak forests (G1.762, 98% of the total habitat present in the LSA) and mountain pastures (E1.7, 4% of the total habitat present in the LSA).

The areas potentially impacted are represented in Figure 6, their numerical estimation is presented in Table 30.

Table 30: construction impacts on habitats of the LSA

| Code | Habitat | Direct impacts (ha) | Direct impacts (%) | Indirect impacts on 100 m buffer (ha) | Indirect impacts on 100 m buffer (%) | Indirect impacts on 300 m buffer (ha) | Indirect impacts on 300 m buffer (%) |
|---------------------------|---|---------------------|--------------------|---------------------------------------|--------------------------------------|---------------------------------------|--------------------------------------|
| Wind farm | | | | | | | |
| E1.7 | Closed non-Mediterranean dry acid and neutral grassland | 64.61 | 1,5 | 326.94 | 8 | 742.49 | 18 |
| F3.2 | Sub-mediterranean deciduous thickets and brushes | 0.27 | <1 | 4.90 | 3 | 14.38 | 10 |
| G1.691 | Southwestern Moesian beech forests (forest) | 2.21 | <1 | 34.16 | 7 | 91.81 | 19 |
| G1.691 (coppice) | Southwestern Moesian beech forests (coppice) | 3.58 | <1 | 65.72 | 3 | 204.26 | 8 |
| G1.762 (coppice) | Helleno-Moesian Quercus fainted forests (coppice) | - | - | - | - | 1.25 | 3 |
| G1.763 | Helleno-Moesian Quercus dalechampii forests | 0.62 | <1 | 4.56 | <1 | 21.28 | 4 |
| G3.1E5 | Balkan Range Picea abies forests | 1.55 | 2 | 17.87 | 26 | 38.28 | 55 |
| G3.4C | South-eastern European Pinus sylvestris forests | - | - | 0.60 | 2 | 7.28 | 24 |
| G3.F12 | Native pine plantations | - | - | 0.85 | 3 | 9.35 | 36 |
| J1.2 | Residential buildings of villages and urban peripheries | - | - | - | - | 2.11 | 3 |
| <i>Windfarm sub-total</i> | | <i>72.84</i> | <i><1</i> | <i>455.60</i> | <i>5</i> | <i>1132.50</i> | <i>13</i> |
| Powerline (OHL) | | | | | | | |

| Code | Habitat | Direct impacts (ha) | Direct impacts (%) | Indirect impacts on 100 m buffer (ha) | Indirect impacts on 100 m buffer (%) | Indirect impacts on 300 m buffer (ha) | Indirect impacts on 300 m buffer (%) |
|----------------------------|--|---------------------|--------------------|---------------------------------------|--------------------------------------|---------------------------------------|--------------------------------------|
| C2.3 | Permanent non-tidal, slow, smooth-flowing watercourses | - | - | 2.22 | 42 | 5.19 | 99 |
| E1.7 | Closed non-Mediterranean dry acid and neutral grassland | 2.08 | <1 | 83.09 | 2 | 174.00 | 4 |
| E1.A | Open Mediterranean dry acid and neutral grassland | 0.91 | <1 | 62.89 | 47 | 133.45 | 99 |
| G1.691 | Southwestern Moesian beech forests (forest) | 1.85 | <1 | 15.98 | 3 | 47.82 | 10 |
| G1.691 (coppice) | Southwestern Moesian beech forests (coppice) | 3.53 | <1 | 36.24 | 1 | 101.98 | 4 |
| G1.762 | Helleno-Moesian Quercus frainetto forests (forest) | 6.43 | 3 | 80.01 | 35 | 226.06 | 98 |
| G1.763 | Helleno-Moesian Quercus dalechampii forests | 0.56 | <1 | 7.82 | 2 | 11.95 | 2 |
| I1.3 | Arable land with unmixed crops grown by low intensity agricultural methods | 1.63 | <1 | 114.63 | 34 | 319.79 | 96 |
| J1.2 | Residential buildings of villages and urban peripheries | 0.11 | <1 | 14.13 | 22 | 54.18 | 83 |
| <i>Powerline sub-total</i> | | <i>17,10</i> | <i><1</i> | <i>417.02</i> | <i>5</i> | <i>1074.42</i> | <i>12</i> |
| <i>Overall total</i> | | <i>89,95</i> | <i>1</i> | <i>872.62</i> | <i>10</i> | <i>2206.91</i> | <i>25</i> |

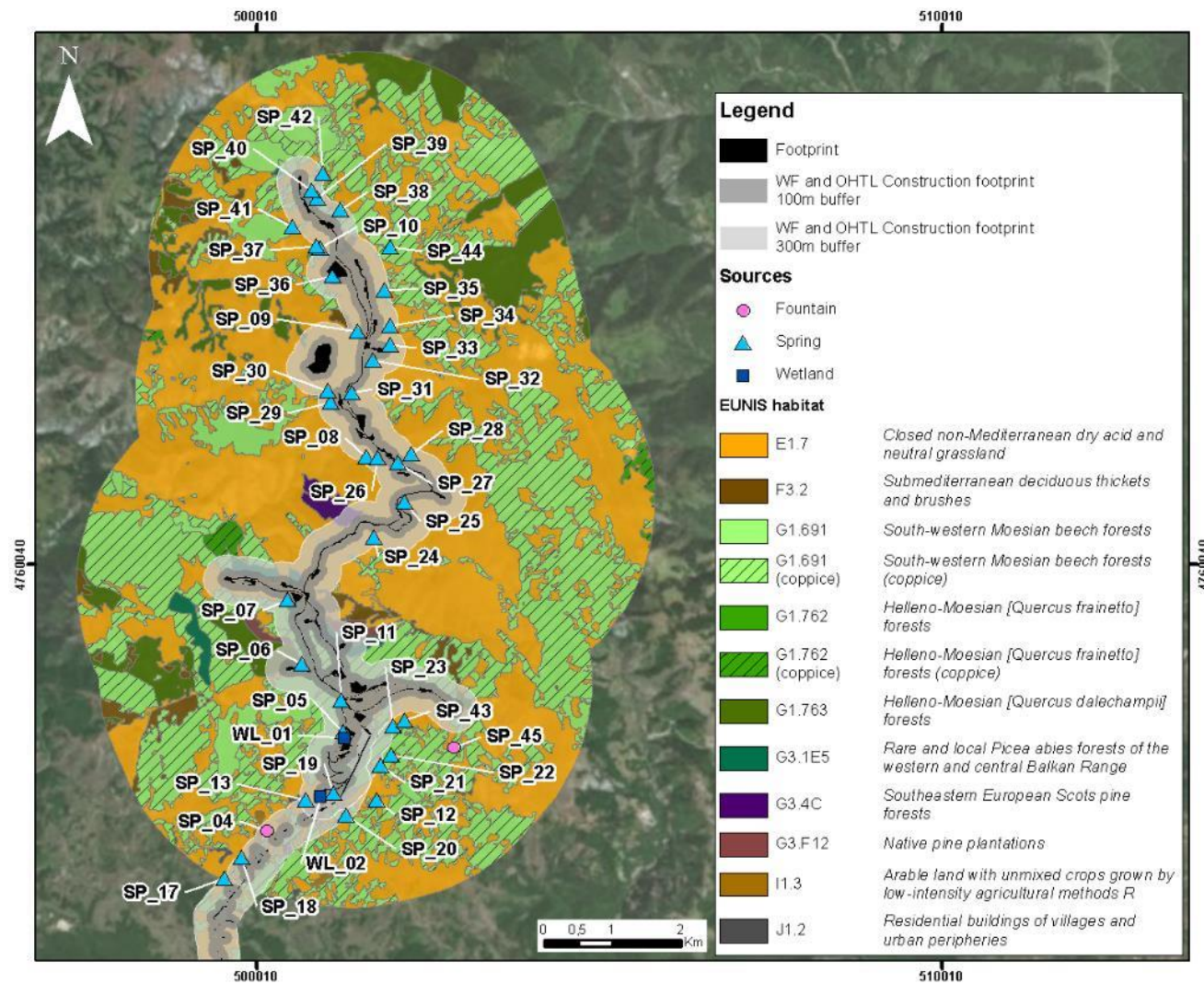


Figure 5: Map of the potential construction impacts on natural and modified habitats within the Wind Farm LSA

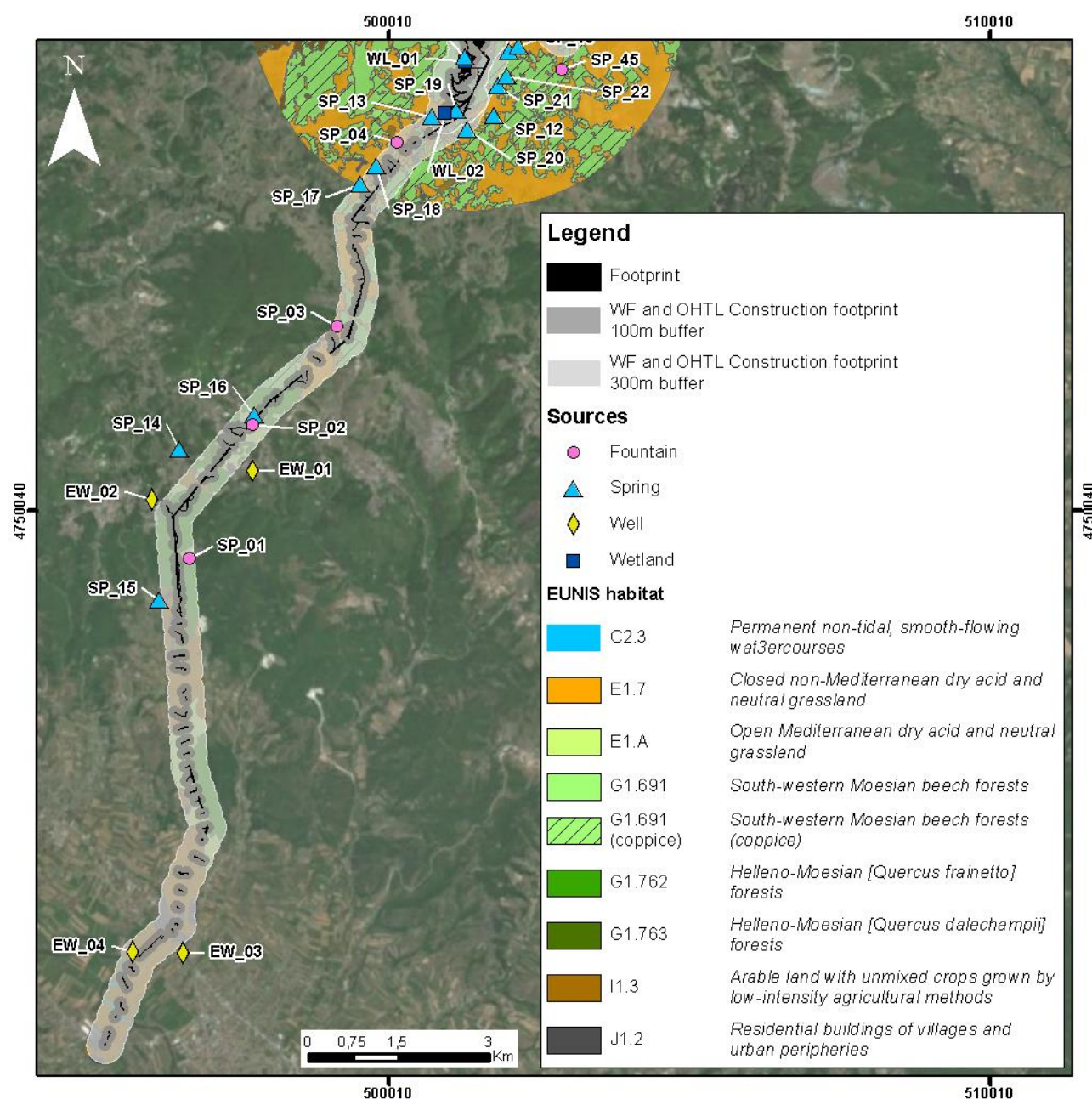


Figure 6: Map of the potential construction impacts on natural and modified habitats within the powerline LSA

7.2.1.2 Mitigation measures

The mitigation measures listed below follow the mitigation hierarchy and are proposed for the construction phase for the entire area that will be disturbed by the Project:

■ Avoidance:

Avoidance measures have been considered particularly during the design of the facilities and include:

- minimisation of the footprint of individual facilities;
- delimitation of the construction areas in order to reduce the risk of footprint creep.

■ Minimization:

1) vegetation and topsoil removal (morphology):

- no tree cutting will be performed during the nesting/maternity period for birds and bats (between April and July), during the same period new ground disturbance activities will also be limited in order to avoid disturbing ground nesting species
- in order to minimize the mortality, biological surveys (pre-construction surveys) will be implemented before vegetation clearance to identify and relocate fauna species. An expert wildlife ecologist will perform pre-construction surveys in the areas to be cleared (not earlier than 7 days before). The survey will focus on fauna species with limited mobility (e.g. reptiles and amphibians) that cannot move ahead of construction. If any of these species are observed, they will be collected by the ecologist and translocated to undisturbed but similar sites within the LSA.
- on-site conservation areas for natural habitats adjacent to Project sites will be protected from unintentional disturbance during construction. Temporary demarcation could be provided by highly visible wooden sticks (50 cm high) planted into the ground and /or flagging tape, while a more permanent fencing could be provided in areas of particular sensitivity (e.g. wetlands) or subject to higher risk of disturbance. In this case appropriate signage will be installed to make the area recognisable by operators and to comply with H&S regulations and plans.
- vehicle movement will be restricted to the existing roads that connect the Project site with the surrounding areas. Off road driving will be prohibited in order to avoid any unnecessary disturbance of natural vegetation.

2) changes in local hydrology:

- all the springs identified during the ongoing fieldwork have been mapped and considered for fencing. During construction works survey the risk of outflow will be identified and minimum viable flow (*sensu* EU Water framework) will have to be kept.
- changes in surface water quality, mainly due to dust from blasting or morphological changes, will be managed by keeping blasting sites as far as possible from water sources.
- domestic wastewater will be treated in package wastewater treatment plant. No water will be discharged. Chemical toilets will be provided to workers and periodically emptied under a safe protocol.
- the presence of stagnant water within and around the construction areas will be avoided through the use of culverts/channels as appropriate.
- if erosion phenomena are observed environmental engineering techniques will be put in place to stop the erosion and ensure soil protection and the development of natural vegetation. Environmental engineering techniques will include as appropriate: erosion control mat, live crib wall, rock mattresses, hydro seeding and afforestation with appropriate species etc.

3) increase in vehicular traffic:

- newly built roads should be considered in the long term only as service roads of the project, in order not to increase, through the project itself, vehicular traffic other than the one linked to the project.
- install speed limits and animal crossing signs on the access road and enforce speed limit along the site access road;
- if necessary, install speed bumps and noise stripes on straight sections of the access road;
- avoid the accumulation of stagnant water and organic waste within the construction site and on the roads, that could attract wildlife, especially amphibians;
- if fauna species are encountered employees and contractors will wait until it moves on by itself or they will ask the assistance of the Environmental technician for its safe removal and relocation in a suitable environment.

- awareness among employees and contractor working on site about the protected species/habitats potentially present in the area will be developed, in order to ensure constant monitoring and promote actions to be taken if wildlife is encountered;

4) emission of noise and vibration:

- care will be taken to select machines and equipment with low noise emissions;
- night works will be avoided (from 8 pm to 6 am at least) to reduce impacts to nocturnal fauna species, especially bats;
- rock blasting activities will be performed during daytime and at regular times to enhance local fauna habituation to noise and to avoid disturbance during critical hours for many species (dusk and dawn).

5) introduction and spreading of alien species:

- if spreading of invasive species is observed, an appropriate eradication program will be developed and implemented.

■ Rehabilitation/Restoration:

Areas cleared during construction for temporary use will be progressively restored, as soon as possible (e.g., with the goal of producing a stable vegetative cover to minimize erosion, dust and spreading of invasive alien species). In fact, vegetation and topsoil restoration activities will be performed in the Wind Farm on all storage areas, which account for a total of 7.21 ha, in order to restore their original habitat. Restoration activities will be performed also on all deposit areas, which account for a total of 20,02 ha, and they will be restored as mountain pasture (E1.7) with a positive impact on biodiversity. In addition, access roads to the OHL will also be restored at the end of the construction phase to their previous habitat for a total of 5.72 ha.

Restoration of areas cleared during construction but not subject to the placement of permanent facilities (deposit areas and storage areas) will be carried out, with the goal of producing a stable vegetative cover to minimize erosion, dust and spreading of invasive alien species.

The action has a positive impact and an important landscape value, as well as an ecological value which is growing with the rapidity by which it is done after excavating the soil. Much of the soil excavated for foundations of pylons will thus allow to restore empty area – also after blasting, contributing positively to a fast re-colonization of native plants.

7.2.1.3 Residual impacts

Considering the application of the abovementioned mitigation measures, the impact on biodiversity components is presented in the following tables and it is expected to be:

- for the windfarm construction LSA: Low
- for the powerline construction LSA: Negligible

Table 31: residual impact assessment matrix for biodiversity during construction phase for the Wind Farm

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|--------------------------------|------------------------|--------------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| Vegetation and topsoil removal | Duration: | Medium-short | Medium | Long term | Medium | Medium | Low |
| | Frequency: | Sporadic | | | | | |

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---|------------------------|-------------------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| | Geo. Extent: | Project footprint | | | | | |
| | Intensity: | Medium | | | | | |
| Changes in local hydrology | Duration: | Medium | Medium | Mid term | Medium | Medium-high | Low |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Medium | | | | | |
| Increase in vehicular traffic | Duration: | Medium | Medium | Mid term | Medium | Medium-high | Low |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Medium | | | | | |
| Emission of noise and vibration | Duration: | Medium | Medium | Short-term | Low | Low | Negligible |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | High | | | | | |
| Introduction and spreading of alien species | Duration: | Medium | Medium | Long term | Medium | Medium-high | Low |
| | Frequency: | Sporadic | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Negligible | | | | | |

Table 32: residual impact assessment matrix for biodiversity during construction phase for the Overhead Line

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---------------|------------------------|----------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| | Duration: | Short | Medium-low | Mid term | Negligible | Medium | Negligible |
| | Frequency: | Sporadic | | | | | |

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---|------------------------|---------------------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| Vegetation and topsoil removal | Geo. Extent: | Project footprint | | | | | |
| | Intensity: | Low | | | | | |
| Increase in vehicular traffic | Duration: | Medium-short | Medium-low | Mid term | Low | Medium-high | Negligible |
| | Frequency: | Moderately frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Low | | | | | |
| Emission of noise and vibration | Duration: | Medium-short | Medium-low | Short-term | Negligible | Low | Negligible |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Medium | | | | | |
| Introduction and spreading of alien species | Duration: | Medium-short | Medium-low | Long term | Low | Medium-high | Negligible |
| | Frequency: | Sporadic | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Negligible | | | | | |

7.2.1.4 Monitoring

The following monitoring activities are foreseen to ensure the implementation and effectiveness of the proposed mitigation measures:

- indirect and direct inadvertent impacts on natural habitats present around the construction site will be monitored monthly in order to assess eventual footprint creep outside designated areas, signs of erosion or stagnant water accumulation, functioning of the water run-off management system, dust deposition on vegetation, presence of waste or hazardous substances spill;

- accidents involving wildlife or the observation of live animal or carcasses along the access road or on the construction site will be recorded. Additional mitigation measures to discourage wildlife presence on site and avoid roadkill will be taken if needed;
- presence and spreading of invasive flora species within and around the construction site will be monitored every three months during the vegetative season by an expert botanist, if necessary, extirpation campaign will be put in place in order to avoid the spreading of the invasive species.
- Bird survey with the Vantage Point technique will be repeated for the breeding season in 2020 (60 h for each Vantage Point from March - August). This will allow to verify if the intense kestrel presence observed in 2019 is regular or not in the area.
- Bats activity will be monitored on all turbines during construction using Static Acoustic Monitoring with the same methodology used during the baseline study on a selection of turbine sites in all three sectors of the Project.

7.2.2 Operational phase

7.2.2.1 Impact Analysis

The potential impacts on biodiversity deriving from the above actions are associated with the following **impact factors**:

- 1) presence of new buildings/infrastructures;
- 2) changes in local hydrology;
- 3) emission of noise and vibration;
- 4) emission of light;

The direct impacts are expected within the facilities footprints (turbines, substations, roads, powerline etc.). Indirect impacts were conservatively considered within a buffer of 100 and 300 meters from the facilities.

All the impact factors identified above are described and discussed in the following assessment.

1) Presence of new buildings/infrastructures:

The presence of the facilities during operation will cause a loss of available natural habitat during the entire operation phase that will directly and indirectly affect habitats, flora and fauna species. The presence of 27 wind turbines, with such morphological characteristics (total height: 178.5 m, hub height: 110 m, rotor diameter: 137 m) will represent a relevant collision risk for bats and birds.

For birds, a complex combination of factors can greatly influence the probability of collision. According to literature (review by Marques et al. 2014), factors contributing to collision risk are:

- Species characteristics (morphology, sensorial perception, phenology, behaviour or number of individuals).
- Site (landscape, flight paths, food availability and weather) as well as wind farm features (turbine type, configuration and lighting).
- Turbine features (height of the turbine, blade length, blade speed) can influence the collision risk, as well as it the wind farm configuration

Based on the results of the Collision Risk Assessment (Annex D to the ESIA package), conducted following the Collision Risk Model developed by the Scottish Natural Heritage since 2000 and following the guidance in their latest versions (SNH 2017 and 2018), the impact on migrant and raptor species is expected to be negligible. According to the model, the IBA-triggering species Short-toed Snake-eagle (*Circaetus gallicus*) may lose one individual every 20 years due to collision with turbines.

The Common Kestrel (LC) is the only bird species that could have a significant impact due to collision with the turbines. The model estimates 100 fatalities of these species during the breeding period, however it is important to consider that this represents a huge overestimate since the model is counting the same individuals over and over again. This is due to the fact that the survey method does not allow assessing whether the observed individuals are always the same and the model assumes no changes in bird numbers and density during the observation period. As Kestrels tend to be territorial and sedentary, it is possible that the observations refer to a limited number of family groups and not to a constant flux of birds. Nevertheless, it is clear that the wind farm has the potential to have a measurable impact on local Common Kestrel population, therefore specific mitigation measures are suggested.

Bats are the most affected animal group by Wind Farm projects. The impact can be through bat mortality as a result of collision with moving turbine blades and/or barotrauma (Arnett et al. 2008, Baerwald et al. 2008, Grodsky et al. 2011, Rollins et al. 2012), or as a result of habitat loss and/or fragmentation that can also negatively reflect to bat populations. Due to their long generation times and low reproductive rates, bats rely on high adult survival to maintain populations (Racey and Entwistle 2000; Barclay and Harder 2003), for this reason it is necessary to guarantee the conservation of bat populations by reducing direct mortality by collision or keep it at rather low levels. Mitigation measures to reduce bat fatalities at wind turbines are thus critically important to maintain viable bat populations and their ecosystem services, and also for the environmental-friendly development of wind energy.

Amorim et al. (2012) extensively studied the Wind farms in Portugal, stating that bats mortality in the Mediterranean region is related to some environmental and seasonal variables:

- Deaths occur more in some periods of the year and (August to October).
- Deaths are also significantly correlated with wind speed (especially if lower than 5 m/s).
- Death occur more with higher temperature (higher than 13 °C);
- Mortality can be influenced by wind direction and humidity.

The Bajgora Wind Farm, despite the rather low bat activity, sees the presence of species from the high flight and sensitive to collision (*Nyctalus leisleri* and *Pipistrellus pipistrellus*) which show a relative high collision risk, while some other species like the group *Pipistrellus kuhlii/nathusii* show a moderate/high collision risk. For this reason, the adoption of conservative mitigative measures to limit mortality is recommended, at least for the wind turbines near the arboreal vegetation.

Despite pre-construction estimation of bat collision risk at wind facilities based on acoustic data gathered prior to the construction, it is not possible to reliably predict post-construction bat fatalities (Hein et al., 2013). A possible explanation for difficulties in predicting bat fatalities from pre-construction data could be that the presence of wind turbines alters the bats' habitat and behavior. Bats may be attracted to wind turbines (Cryan et al. 2014) and/or change their habits of site use due to changes in habitat. These changes may include the creation of new hunting grounds (eg. clearings) and guidance

structures (eg access routes) (Arnett et al. 2008; Cryan 2008; Cryan and Barclay 2009). Additional monitoring for two year during the operation phase are suggested in order to elaborate turbine specific mitigation measures (see section 7.2.2.4 Monitoring).

For terrestrial wildlife, the presence of the construction facilities is not expected to cause functional habitat fragmentation within the LSA due to the distance between the towers (375 m to 980 m). Nonetheless, some impacts on animal behaviour was recorded for some WFs and is reported in the scientific literature. Arnett et al. (2007) proposed that the largest impact of wind power on terrestrial mammals lies in the indirect factors, mainly human disturbance (including a facilitation of hunting activities). Helldin et al. 2012, confirm that the main factor is thus indirect, probably the increased access for recreation, hunting and leisure traffic.

The OHL is a potential element of linear fragmentation in forest habitat. In addition, for birds and bats there is a risk of mortality from collision and electrocution. The risk depends also on the configuration of the OHL that still needs to be confirmed. Since rivers are ecological corridors in general, especially when located in farming areas, the River Sitnica crosses the powerline in a perpendicular way, making the crossroad a point where the impact could be higher.

2) Emission of noise and vibration:

Noise generated from wind turbines are mainly of two types: mechanical and aerodynamic. Mechanical noise is generated from various machinery components in the wind turbine and is tonal in character. Aerodynamic noise is generated due to flow of air above the blades which interacts in different ways with the blade surface, leading to different aerodynamic noise source (Desmuck et al. 2019).

The sound power level of a wind generator is typically in the order of 95 to 105 dBA (a measure of the noise power emitted by the machine, not of the noise humans hear) and this generally create a sound pressure level of about 50 to 60 dBA at 40m away from the base of the generator. At 500m downwind of the turbine the sound pressure level would be 30 to 40 dBA (SEA Pty Ltd., 2004). In addition, the most prominent frequency range of the aerodynamic sound created by wind turbines is 63-4,000 Hz (Naturvårdsverket, 2010).

Mammals can hear in the bandwidth from below 10 Hz to over 150 kHz, with sensitivity down to 20 dB, while rodents and bats hear best at high frequencies (Ketten 1992). Birds have more uniform hearing capabilities than mammals (Dooling 1980): all birds hear well in the range from 100 Hz to around 8–10 kHz, and most have best sensitivities around 0–10 dB (owls are 15–20 dB more sensitive in their best range than other birds). Reptile hearing is poorly-studied (Fay 1988), but in general, as a group, have more limited range than birds, from 50 Hz to at most 2 kHz. Amphibians have variable hearing capacities specialized for the perception of social and other meaningful signals, but overall, their bandwidth lies between 100 Hz and 2 kHz with a best sensitivity ranging widely from 10 dB to 60 dB (Bowles, 1995).

Accordingly, the above-mentioned species overlap in hearing with the frequency range of wind turbine noise, suggesting that individuals will readily perceive this sound.

The emission of noise and vibration is relevant during the operational phase of a wind plant, but in the long term it also can be defined more usual and “predictable” in time and space (Helldin *et al.*, 2012). In fact, animals exposed to prolonged or repeated human disturbance may eventually adapt both behaviourally and physiologically and become “habituated” (Petrinovich 1973). Additionally, the fact that the wind turbine noise is not associated with an immediate risk suggests that the animals should be able to habituate to the sound (Helldin *et al.*, 2012).

Reactions of terrestrial animals to wind farms is different and species dependent, since foraging methods and environmental factors (e.g., predator presence) may significantly affect the behaviour of animals.

Nevertheless, different studies on domestic animals have shown that noise levels of 60–75 dBA may cause increased respiration and heart rate, increased vigilance, and decreased time for grazing (Ames & Arehart 1972, Christensen et al. 2005). There is no corresponding limit for wild animals in outdoor environments, however, Helldin *et al.* (2012) calculations (based on Naturvardsverket, 2010) confirm that the noise level directly under a wind turbine (1.5 MW, hub height 60 m) is between 50 and 60 dBA (equivalent continuous sound level), thus below the limit where effects on domestic animals have been described.

Wind turbine noise can also be masked by other sounds in the environment, such as traffic or the wind in the vegetation, and thus at least at times appear less annoying (Naturvardsverket 2010). The impact of wind turbine noise on animal well-being and health can therefore be assumed to be limited (Helldin *et al.*, 2012).

Terrestrial animals can potentially be affected by wind power development in various ways (Lovich and Ennen 2013), but the empirical evidence suggests a lack of such effects during the operational phase of wind farms or a swift habituation of animals to the disturbance, thus suggesting a limited impact (Helldin et al. 2012; Lovich and Ennen 2013; Łopucki and Mróz 2016; Menzel and Pohlmeier 1999; Walter et al. 2006; Winder et al. 2014a, b).

The effects of noise disturbance from human activity on wildlife are mostly perceived over short distances in a species- specific way (up to ~ 300 m, Reijnen et al., 1995; Canaday and Rivadeneyra, 2001). Therefore, using a precautionary approach, a 300 m buffer is considered around the wind turbines.

Nevertheless, the fact that an animal remains in a place in spite of human disturbance does not necessarily mean that the animal is not disturbed, but may indicate that there are no alternative habitats (Gill et al. 2001, Stankowich 2008). It is therefore difficult to determine if the animals have become accustomed to human disturbance or if there are no other options.

3) Changes in local hydrology;

During operation, integrity and functionality of the stormwater drainage network along access roads and in correspondence to wind turbines and other permanent structures may be reduced and compromised by normal wear and exceptional rainfall events. Disruption stormwater drainage network may locally cause the uncontrolled discharge of stormwater on natural slopes and artificial embankments.

This could have negative affect on surrounding habitats, and as a consequence to flora and fauna, due to the formation of stagnant water or water erosion features.

Additionally, using a precatory approach, a 100 m buffer is considered around internal and external roads.

4) Emission of light:

During the operational phase, the impact could be due to aviation obstruction lights placed at the nacelle and tower lights (installed on middle of the tower) of most of the turbines. This light will be flashing lights with a white colour during the day and a red colour during the night.

Similar flashlight will be positioned on the OHL pylons on both sides of the highway. The presence of long-term security lights is still unsure.

Lights can have an attracting effect on night-flying wildlife, which would result being attracted towards the rotor of the turbine, with a high risk of collision and mortality. Ecological light pollution can affect fauna species foraging and reproductive behaviour, biological clocks, predator-prey interactions, movement and dispersal patterns, community structure, and interactions among and within species (Longcore T., Rich, C. 2004¹). Effects are likely species-specific, based on the role ambient light plays in physiology and behaviour, and might also depend on the type of lighting used. The taxa that are more likely to be affected by light pollution are bats, birds and insects.

Bats, depending on the species, are either attracted to lights by the presence of insects or they avoid lighted areas. Artificial lighting increases the foraging efficiency of many bat species, but it might simultaneously increase their risk of being predated. For bats Voigt et al. (2018) highlight a response of migratory bats toward light that was dependent on light color. According to the authors, migratory bats can be attracted by a red lights such as the project aviation lights.

Birds are particularly subject to negative impacts from light emissions. Artificial lighting can affect nocturnal and migratory species (Rich C., Longcore T., 2006²). Also diurnal species, such as swallows, and raptors, can be affected if the lights are bright enough, however it is not the case with aviation safety lights. Nocturnal migratory species are disorientated and attracted by the sky glow during the night. This effect arises especially under foggy and rainy weather conditions (Kyba, Ruhtz, Fischer, Hölker, 2011³). Bird mortality as a result of tall lighted structures is relatively well documented, especially along migratory routes, due to collision with the structure or with other birds. The fatalities depend on the type of light. Fixed white lights attract more individuals than flashing or coloured.

Insects are not only attracted to lights, but they are also more susceptible to predation around lighted areas. Species of reptiles, amphibians, birds, bats and spiders have been shown to wait around artificial lights for prey. Artificial lighting might also undermine the evasive and defensive tactics normally used by insects.

Direct impacts of the wind farm from presence of new buildings/infrastructures will impact less than 1% of the total LSA. All the direct impacts will be on mainly concentrated on mountain pastures (E1.7, <1% of the total habitat present in the LSA).

In addition, direct impacts of the OHL will impact less than 1% of the total LSA. All the direct impacts will be mainly concentrated on oak forests (G1.762, 2% of the total habitat present in the LSA). No indirect impacts in the 100 m and 300 m buffer deriving from the OHL footprint are expected to be presents.

Indirect impacts in the 100 m buffer deriving from the wind farm, such as changes in morphology and hydrology could impact a total of 5% of the LSA. Indirect impacts from the wind farm in the 100 m buffer will be mainly on mountain pastures (E1.7, 7.5% of the total habitat present in the LSA) and beech coppice forests (G1.691 coppice, 2% of the total habitat present in the LSA).

Indirect impacts in the 300 m buffer deriving from the wind farm, such as noise and vibration and emission of light, could impact a total of 10% of the LSA. Indirect impacts from the wind farm within the 300 m buffer will be

¹ LONGCORE, T., RICH, C. 2004. Ecological light pollution. *Front Ecol Environ* 2004; 2[4]: 191– 198.

² RICH, C. & LONGCORE, T., 2006. *Ecological Consequences of Artificial Night Lighting*. Island Press Washington, DC.

³ Kyba, C.C.M., Ruhtz, T., Fischer, J., Hölker, F., 2011. Cloud Coverage Acts as an Amplifier for Ecological Light Pollution in Urban Ecosystems. *PLoS ONE*. 2011, Vol. 6 Issue 3, p1-9. 9p.

mostly on mountain pastures (E1.7, 13% of the total habitat present in the LSA) and beech coppice forests (G1.691 coppice, 7% of the total habitat present in the LSA).

The areas potentially impacted are represented in Figure 7 and Figure 8 and their numerical estimation is presented in Table 33.

Table 33: operation impacts on habitats of the LSA

| Code | Habitat | Direct impacts (ha) | Direct impacts (%) | Indirect impacts on 100 m buffer (ha) | Indirect impacts on 100 m buffer (%) | Indirect impacts on 300 m buffer (ha) | Indirect impacts on 300 m buffer (%) |
|------------------|---|---------------------|--------------------|---------------------------------------|--------------------------------------|---------------------------------------|--------------------------------------|
| Wind farm | | | | | | | |
| E1.7 | Closed non-Mediterranean dry acid and neutral grassland | 37.81 | <1 | 313.70 | 7 | 556.37 | 13 |
| F3.2 | Sub-mediterranean deciduous thickets and brushes | 0.27 | <1 | 4.90 | 3 | 9.22 | 6 |
| G1.691 | Southwestern Moesian beech forests (forest) | 2.21 | <1 | 33.31 | 7 | 59.19 | 12 |
| G1.691 (coppice) | Southwestern Moesian beech forests (coppice) | 3.24 | <1 | 61.79 | 2 | 167.57 | 7 |
| G1.762 (coppice) | Helleno-Moesian Quercus fainted forests (forest) | - | - | - | - | 1.04 | 2 |
| G1.763 | Helleno-Moesian Quercus dalechampii forests | 0.62 | <1 | 4.55 | <1 | 19.63 | 4 |
| G3.1E5 | Balkan Range Picea abies forests | 1.55 | 2 | 17.87 | 26 | 39.07 | 56 |
| G3.4C | South-eastern European Pinus sylvestris forests | - | - | 0.60 | 2 | - | - |
| G3.F12 | Native pine plantations | - | - | 0.85 | 3 | 7.89 | 30 |

| Code | Habitat | Direct impacts (ha) | Direct impacts (%) | Indirect impacts on 100 m buffer (ha) | Indirect impacts on 100 m buffer (%) | Indirect impacts on 300 m buffer (ha) | Indirect impacts on 300 m buffer (%) |
|-------------------------------|--|---------------------|---------------------|---------------------------------------|--------------------------------------|---------------------------------------|--------------------------------------|
| <i>Windfarm sub-total</i> | | <i>45.71</i> | <i><1</i> | <i>437.58</i> | <i>5</i> | <i>859.98</i> | <i>10</i> |
| <u>Powerline (OHL)</u> | | | | | | | |
| E1.7 | Closed non-Mediterranean dry acid and neutral grassland | 0.28 | <0,01 | n.a. | - | n.a. | - |
| E1.A | Open Mediterranean dry acid and neutral grassland | 0.11 | <0,1 | n.a. | - | n.a. | - |
| G1.691 | Southwestern Moesian beech forests (forest) | 1.63 | <1 | n.a. | - | n.a. | - |
| G1.691 (coppice) | Southwestern Moesian beech forests (coppice) | 3.08 | <1 | n.a. | - | n.a. | - |
| G1.762 | Helleno-Moesian Quercus fainted forests (coppice) | 5.49 | 2 | n.a. | - | n.a. | - |
| I1.3 | Arable land with unmixed crops grown by low intensity agricultural methods | 0.55 | <1 | n.a. | - | n.a. | - |
| <i>Powerline sub-total</i> | | <i>11.38</i> | <i><1</i> | <i>n.a.</i> | <i>-</i> | <i>-</i> | <i>-</i> |
| <i><u>Overall total</u></i> | | <i><u>57.08</u></i> | <i><u><1</u></i> | <i><u>437.58</u></i> | <i><u>5</u></i> | <i><u>859.98</u></i> | <i><u>10</u></i> |

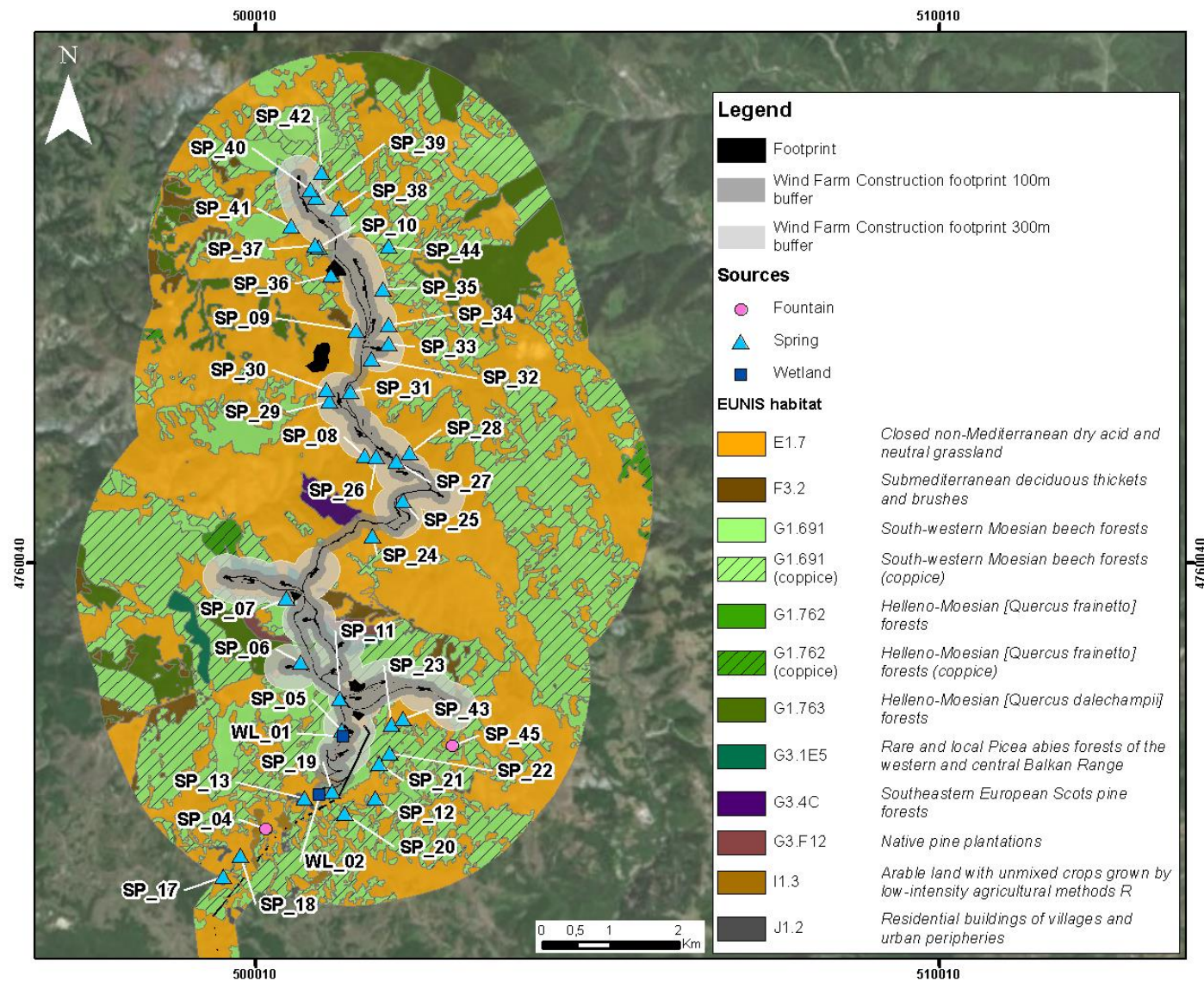


Figure 7: Map of the potential operation impacts on natural and modified habitats within the Wind Farm LSA

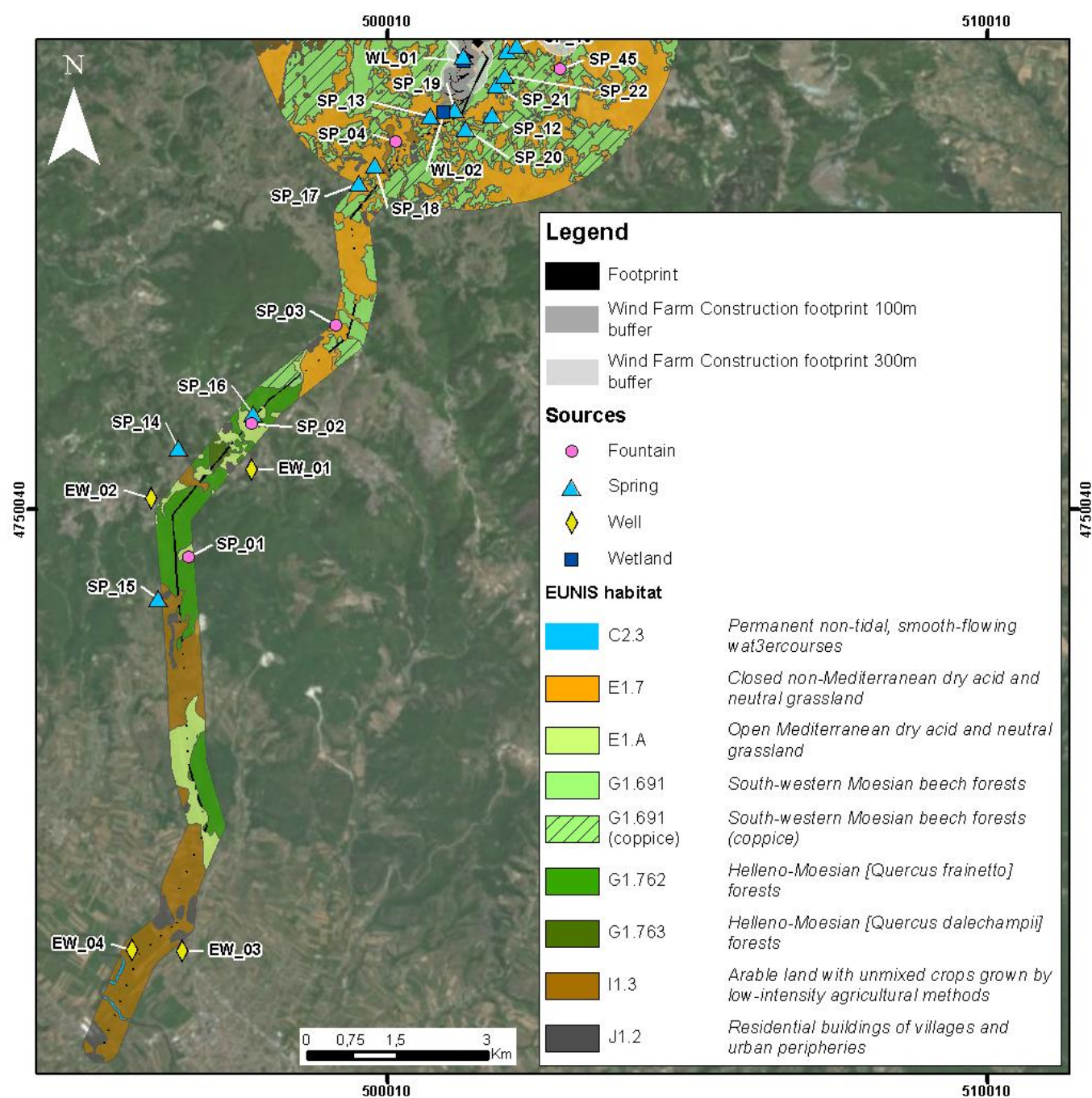


Figure 8: Map of the potential operation impacts on natural and modified habitats within the powerline LSA

7.2.2.2 Mitigation measures

The mitigation measures listed below follow the mitigation hierarchy and are proposed for the operation phase for the entire area that will be disturbed by the Project:

1) Presence of new buildings/infrastructures:

- For the Wind Farm:
- General measures:

- Hunting and collection of wild animals, by employee and contractors will be strictly prohibited within the Project area, at least in the Wind farm area, in order to avoid further stress to present wildlife;
 - Avoid attracting wildlife: by periodical removal of carcasses from the ground is key, appropriate garbage management and disposal, elimination of stagnant water;
 - Hunting and collection of wild animals, and in particular of *Testudo hermanni* (Hermann's tortoise) by employees and contractors will be strictly prohibited within the Project area;
 - Feeding of wildlife or stray cats and dogs will be prohibited on-site and organic waste will be carefully managed and disposed of in order to avoid attraction of wildlife or stray cats and dogs
- Bird and Bats specific measures:
- Turbines and infrastructures will not offer perching or breeding opportunities for birds and bats.
 - Free-wheeling i.e. free spinning of rotors under low wind conditions with no power generation, will be eliminate;
 - A minimum of 10 aluminum nesting boxes will be installed of the pylons of the OHL in suitable habitats. This will offer breeding opportunity for new pairs of Common Kestrel in order to compensate for the potential loss of the population at Bajgora. The nests will be located at least at 5 km distance from the turbines.
 - For all turbines the cut-in wind speed will be set to 5 m/s from sunset to sunrise for two year according to the following scheme:
 - ◆ from 1st May to 30th September;
 - ◆ from 1st to 30th April and from 1st to 31st October only with temperature above 6°C;
- Turbine specific cut-in wind speed mitigation measures will be proposed, if necessary, after the first year of monitoring of bat activity and correlation with meteorological parameters (wind, temperature and precipitation). The measures will be reassessed after each year based on the new information collected
- For the OHL lines (OHL):
- the lower power line cables are to the ground, the better for preventing bird collision.
 - in order to minimize the risk of collision, the main aim is to make lines more visible to birds, since the assumption is that birds collide with overhead cables because they cannot see them (AEWA, 2012). Such measure is particularly needed in case of potential flying corridors such as the River Sitnica. In this portion of the powerline line markers need to be installed on the earth wire (also called ground or shield wire) according to the following best practice measures suggested below.
 - line markers should be as large as possible, and increase the visible thickness of the line by at least 20 cm, for a length of at least 10-20 cm;
 - spacing of devices should be not more than 5-10 m apart;
 - line markers should incorporate as much contrast with relevant backgrounds as possible, colour is probably less important than contrast;

- movement of the device and markers that protrude vertically both above and below the cable are likely important;
- since we suspect that many collisions may occur at night, devices that are nocturnally visible (phosphorescence, ultraviolet radiation and other means) would be advantageous;

2) Changes in local hydrology:

- perform a suitable stormwater drainage network in correspondence to access roads, wind turbines, temporary storage/deposit areas and other relevant construction areas. Stormwater from the drainage network must be channelled to secondary hydrographic network or other suitable drainage feature and discharged in a controlled way. Appropriate measures must be adopted to protect discharge points and channels from erosion;
- implement monitoring and maintenance activities included in the stormwater and erosion management plan.

3) Emission of noise and vibration:

- during regular operation and maintenance, keep selecting and using machines and equipment with low noise emissions (e.g. suitable mufflers on engine exhausts and compressor components; machines and equipment with low noise emissions).

4) Emission of light:

- while respecting the national aviation authority and relevant international codes prescriptions it is recommended to keep the number of light sources to the minimum;
- all lights should flash synchronously, lights should flash at around 3 seconds frequency.
- preferred types of light in exterior lighting (e.g: lights on site due to security reasons) applications are:
 - Low pressure sodium lamps (SOX): orange lamps seen along roadsides
 - Light emitting diodes (LEDs): light source of choice, emitted more directional, warmer colour temperatures (~ 3000°K),
 - lights triggered by presence detectors, and lights oriented to the ground.
- these types of lights should be avoided:
 - mercury lamps (MBF): bluish-white lamps (attract insects and tolerant bat species)
 - high pressure sodium lamps (SON): brighter pinkish-yellow lamps; used as road lighting

7.2.2.3 *Residual impacts*

After application of the abovementioned mitigation measures, the impact on biodiversity components is presented in the following tables. Considering the different potential residual impacts of the wind farm on the general biodiversity component and on birds and bats, a separate table was prepared for the latter.

For the evaluation of residual impacts on birds and bats a precautionary approach was applied since studies on the sensitivity of this component are still ongoing.

Residual impacts on biodiversity are expected to be:

- for the windfarm LSA:

- general biodiversity: Low
- birds and bats: Negligible
- for the powerline LSA: Negligible

Table 34: residual impact assessment matrix for biodiversity (except birds and bats) during the operation phase for the Wind Farm

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|--|------------------------|---------------------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| Presence of building and infrastructures | Duration: | Long | Medium | Long term | High | Medium-high | Low |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Project footprint | | | | | |
| | Intensity: | Low | | | | | |
| Emission of noise and vibration | Duration: | Long | Medium | Short-term | Negligible | Low | Negligible |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Negligible | | | | | |
| Emission of light | Duration: | Long | Medium | Short-term | Low | Medium | Negligible |
| | Frequency: | Highly frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Low | | | | | |
| Changes in local hydrology | Duration: | Long | Medium | Short-mid-term | Low | Medium-high | Negligible |
| | Frequency: | Moderately frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Negligible | | | | | |

Table 35: residual impact assessment matrix for birds and bats during the operation phase for the Wind Farm

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|--|------------------------|---------------------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| Presence of building and infrastructures | Duration: | Long | Medium | Long term | High | High | Negligible |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Project footprint | | | | | |
| | Intensity: | Low | | | | | |
| Emission of noise and vibration | Duration: | Long | Medium | Short-term | Negligible | Low | Negligible |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Negligible | | | | | |
| Emission of light | Duration: | Long | Medium | Short-term | Low | Medium | Negligible |
| | Frequency: | Highly frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Low | | | | | |
| Changes in local hydrology | Duration: | Long | Medium | Short-mid-term | Low | Medium-high | Negligible |
| | Frequency: | Moderately frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Negligible | | | | | |

Table 36: residual impact assessment matrix for biodiversity during operation phase for the Overhead Line

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---------------|------------------------|------------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| | Duration: | Long | Medium | Mid term | Medium | High | Negligible |
| | Frequency: | Continuous | | | | | |

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|--|------------------------|-------------------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| Presence of building and infrastructures | Geo. Extent: | Project footprint | | | | | |
| | Intensity: | Negligible | | | | | |
| Emission of light | Duration: | Long | Medium | Short-term | Low | Medium | Negligible |
| | Frequency: | Highly frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Negligible | | | | | |

7.2.2.4 Monitoring

The following monitoring activities are foreseen to ensure the implementation and effectiveness of the proposed mitigation measures:

- the rehabilitation of dumping areas and storage areas presence will be monitored every three months during the vegetative season (April to September) in order to ensure the correct re-vegetation of the area and intervene in a timely manner in case of signs of erosion;
- presence and spreading of invasive flora species within and around the construction site will be monitored every three months during the vegetative season by an expert botanist, if necessary, extirpation campaign will be put in place in order to avoid the spreading of the invasive species;
- Common Kestrel nest boxes installed on the OHL will be monitored for occupancy and breeding success for the first 5 years to assess impact of compensation measure;
- Bats activity will be monitored on all turbines for the first two years of operation. A recording device of bats calls called Batcorders (<https://ecoobs.com/products/hardware/gsm-batcorder/>) will be installed on all nacelles and operated every day from sunset to sunrise from April 1st to October 31st. Temperature and a precipitation sensor should also be installed. Recorded acoustic sequences will be analysed by appropriate software to automatically identify bat calls in the batcorder recordings and also to identify species and species groups. The data collected during the two years of monitoring will be analyzed with the software-tool ProBat (available in German and English from: <http://windbat.techfak.fau.de>) in order to estimate fatality rates, and calculates specific algorithms cut-in wind speeds for each turbine based on acoustic activity data and wind speed to maintain an acceptable possible mortality of less than 2 dead bats per turbine (Behr et al., 2017).

7.2.3 Key Biodiversity Features

Impacts are assessed separately during construction and operation for the following key biodiversity features identified during the baseline assessment:

- Natural Habitats and habitats triggering PBF:
- flora species determining PBF and CH;

- fauna species determining PBF and CH.

7.2.3.1 Construction phase

7.2.3.1.1 Impact analysis

Natural Habitats and Habitats triggering PBF

The potential impacts on Natural Habitats and habitats triggering PBF are associated with the following impact factors:

- 1) vegetation and topsoil removal;
- 2) changes in local hydrology;
- 3) increase in vehicular traffic;
- 4) emission of noise and vibration;
- 5) emission of light;
- 6) introduction and spreading of alien species;

The general effects of impact factors were described in the previous chapter, while the potential direct and indirect impact that could occur on the individual habitats are summarized in the table below.

| Habitat type | PBF /NH /CH | Distribution | WF/ OHL | Potential direct impacts | Potential indirect impacts |
|---|-------------|---|-------------------------|---|---|
| Natural Habitats | NH | - | WF/OHL | The loss due to direct impacts is calculated as 88.21 ha | The indirect impacts could affect 743.01 ha in the 100 m buffer and 1821.47 ha in the 300 m buffer |
| Kopaonik KBA - IBA | PBF | - | WF | The loss due to direct impacts is calculated as 39.74 ha | The indirect impacts could affect 227.99 ha in the 100 m buffer and 379.04 ha in the 300 m buffer |
| 91W0 Moesian beech forests | PBF | Found within EUNIS G1.691 (no coppice area) | WF/OHL (higher section) | The loss due to direct impacts is calculated as 4.06 ha | The indirect impacts could affect 50.13 ha in the 100 m buffer and 139.63 ha in the 300 m buffer |
| 9410 Acidophilous <i>Picea</i> forests of the montane to alpine levels (<i>Vaccinio-Piceetea</i>) | PBF | Potentially found within EUNIS habitat G3.1E5 | WF | It is not possible to calculate exact impact since the distribution of this habitat is unknown. In the worst-case scenario, the loss could be equal to that of G3.1E5 (1.55 ha) | It is not possible to calculate exact impact since the distribution of this habitat is unknown. In the worst-case scenario, the loss could be equal to that of G3.1E5 (17.87 ha in the 100 m buffer and 38.28 ha in the 300 m buffer) |

| Habitat type | PBF /NH /CH | Distribution | WF/ OHL | Potential direct impacts | Potential indirect impacts |
|--|-------------|--------------------|-------------------------|--|---|
| E1.7 - Closed non-Mediterranean dry acid and neutral grassland | PBF | EUNIS habitat E1.7 | WF/OHL (higher section) | The loss due to direct impacts is calculated as 66.69 ha | The indirect impacts could affect 410,04 ha in the 100 m buffer and 916.49 ha in the 300 m buffer |

Flora species determining PBF and CH

The potential impacts on flora species triggering PBF and CH are associated with the following impact factors:

- 1) vegetation and topsoil removal;
- 2) changes in local hydrology;
- 3) introduction and spreading of alien species;

The general effects of these impact factors were described in the previous chapter, while the potential direct and indirect impact that could occur on the individual SCCs are summarized in the table below. It is important to highlight that the areas investigated represent a small part of the LSA, and therefore the estimate of the percentage of lost habitat does not reflect the percentage of the actual distribution within the LSA.

| Species | Common name | PBF /CH | Potential direct impacts | Potential indirect impacts |
|------------------------------|----------------------------|---------|--|--|
| | | | Area (ha)* | Area (ha)* |
| <i>Echium russicum</i> | Red-flowered viper's grass | PBF | The loss due to direct impacts is calculated as 0.16 ha (2% of the area where the species has been detected), which include 8 sub- populations for a total of 45 individuals | 3.67 ha (46% of the area where the species has been detected) |
| <i>Gentianella bulgarica</i> | Dwarf Bulgarian gentian | PBF | The loss due to direct impacts is calculated as 0.16 ha (3% of the area where the species has been detected) | 3.67 ha (68% of the area where the species has been detected) |
| <i>Daphne blagayana</i> | Blagay's Daphne | CH | The loss due to direct impacts is calculated as 7.53 ha (9% of the area where the species has been detected) | 43.28 ha (49% of the area where the species has been detected) |
| <i>Senecio procerus</i> | Groundsel | CH | The loss due to direct impacts is calculated as 0.96 ha (17% of the area where the species has been detected) | 3.26 ha (57% of the area where the species has been detected) |

*Distribution area of threatened plant species in the WF Selac Project area, determined by Biomaster Ltd. during 2018 surveys.

Fauna species determining PBF and CH

The potential impacts on fauna species triggering PBF are associated with the following impact factors:

- 1) vegetation and topsoil removal;
- 2) changes in local hydrology;
- 3) increase in vehicular traffic;
- 4) emission of noise and vibration;
- 5) emission of light;
- 6) introduction and spreading of alien species;

The general effects of impact factors were described in the previous chapter, while the potential direct and indirect impacts that could occur on a selection of the SCCs are discussed in the table below. The species have been selected to represent ecological requirements of the entire range of SCCs identified in Chapter 6B.

| Taxon | Species | Common name | PBF /CH | Potential direct impacts | Potential indirect impacts |
|-------------|-------------------------------|---------------------|---------|--|--|
| Coleoptera | <i>Lucanus cervus</i> | Stag beetle | PBF | Direct impacts could be associated with loss of individuals during vegetation and top soil removal in forest habitats. | Indirect impacts from the project could occur in a 100 m and 300 m buffer and are mainly associated with the possible changes in the habitat suitability because of habitat fragmentation and behavioural changes in predator species due to the presence of noise and light. |
| Lepidoptera | <i>Coenonympha orientalis</i> | Balkan Heath | PBF | Direct impacts could be associated with loss of individuals or host flora species during vegetation and topsoil removal, mainly in grassland habitats, but also in forests and wetlands. | Indirect impacts from the project could occur in a 100 m and 300 m buffer and are mainly associated with the possible changes in the habitat suitability due to the effects of habitat fragmentation, changes in local hydrology and behavioural changes in predator species due to the presence of noise and light. |
| | <i>Euphydryas aurinia</i> | Marsh fritillary | PBF | | |
| | <i>Lycaena dispar</i> | Large copper | PBF | | |
| | <i>Parnassius apollo</i> | Apollo | PBF | | |
| Amphibians | <i>Bombina variegata</i> | Yellow-bellied toad | PBF | Direct impacts could be associated with loss of | Indirect impacts from the project could occur in a 100 m |

| Taxon | Species | Common name | PBF /CH | Potential direct impacts | Potential indirect impacts |
|----------|---------------------------|--------------------|---------|---|---|
| | <i>Triturus cristatus</i> | Crested newt | PBF | individuals during vegetation and topsoil removal, mainly in or close to wetland habitats and accidental loss due to increased traffic. | and 300 m buffer and are mainly associated with changes in local hydrology and behavioural changes in predator species due to the presence of noise and light. |
| Reptiles | <i>Testudo hermanni</i> | Hermann's tortoise | PBF | Direct impacts could be associated with loss of individuals during vegetation and topsoil removal, mainly in grassland /shrubland habitats and accidental loss due to increased traffic. | Indirect impacts from the project could occur in a 100 m and 300 m buffer and are mainly associated with presence of noise and light and artificial hydrological and morphological features that could limit the species mobility within its home range. |
| Birds | <i>Alcedo atthis</i> | Common kingfisher | PBF | No direct impact is expected on this species since freshwater habitats are not affected by the Project. | Limited indirect impacts from the 300 m buffer and are mainly associated with the emission of noise for the construction of the pylons situated close to the River. |
| | <i>Alectoris graeca</i> | Rock partridge | CH | Direct impacts could be associated with loss of individuals (chicks and eggs) during vegetation and topsoil removal, mainly in grassland habitats, due to potential ground nest disturbances caused by the Project. | Indirect impacts from the project could occur in a 100 m and 300 m buffer and are mainly associated with the possible changes in the foraging areas because of habitat fragmentation and attraction or repulsion of preys and predator species due to the presence of noise |
| | <i>Circaetus gallicus</i> | Short-toed snake | CH | No direct impact is expected on this species. | Indirect impacts from the project could occur in a 100 m and 300 m buffer and are mainly associated with the possible changes in the foraging areas because of habitat fragmentation and attraction or repulsion of preys due to the presence of noise |

| Taxon | Species | Common name | PBF /CH | Potential direct impacts | Potential indirect impacts |
|---------|---------------------------------|---------------------------|---------|---|---|
| | <i>Monticola saxatilis</i> | Rufous-tailed Rock-thrush | CH | No direct impact is expected on this species. | Indirect impacts from the project could occur in a 100 m and 300 m buffer and are mainly associated with the possible changes in the foraging areas because of habitat fragmentation and attraction or repulsion of preys and predator species due to the presence of noise |
| Bats | <i>Tadarida teniotis</i> | European free tailed bat | PBF | Direct impact could be associated with the loss of individuals related to the destruction of roosting or maternities sites during tree cutting. | Indirect impacts from the project could occur in a 100 m and 300 m buffer and are mainly associated with the possible changes in the foraging areas because of habitat fragmentation and attraction or repulsion of preys and predator species due to the presence of noise. The effect of fragmentation could be particularly important for <i>Rhinolophus mehelyi</i> , as it is already patchily distributed, and <i>Rhinolophus hipposideros</i> , as it's known to forage almost exclusively in woodlands and avoids open areas. |
| | <i>Rhinolophus hipposideros</i> | Lesser Horseshoe bat | PBF | | |
| | <i>Rhinolophus mehelyi</i> | Mehely's Horseshoe Bat | PBF | | |
| Mammals | <i>Canis lupus</i> | Grey wolf | PBF | No direct impact is expected on this species. | Indirect impacts from the project could occur in a 100 m and 300 m buffer and are mainly associated with the possible changes in the foraging areas because of habitat fragmentation and attraction or repulsion of preys species due to the presence of noise. |

7.2.3.1.2 Mitigation measures

In addition to the avoidance, minimization and rehabilitation/restoration measures proposed in the section 7.2.1.2, the following measure are proposed specifically for key biodiversity features.

General

Avoidance/Minimization:

- **Scouting of temporary storage areas:** the micro-siting of temporary storage areas (and dumping areas to the extent possible) will be decided after scouting activities performed by an expert ecologist. The scope of the micro-siting will be to avoid the natural habitats, PBF and CH and instead select modified habitat or natural habitat already heavily degraded by sources other than the Project (e.g. overgrazing, erosion, off-road driving).

Natural Habitats and habitats triggering PBF

Rehabilitation/restoration:

- **Restoration of pre-existing degraded areas:** natural habitat not directly included into the project footprint and severely degraded by sources other than the Project (e.g. overgrazing, erosion, off-road driving) will be rehabilitated in order to increase their naturalness level, reduce the risk of invasive species spreading and control erosion. The presence of well-maintained roads will also likely discourage off-road driving which is an evident source of habitat degradation on site.

Flora species determining PBF and CH

Minimization:

- **Flora salvaging:** flora individuals belonging to flora species determining CH and PBF, directly impacted by the project shall be identified, salvaged prior to construction and directly translocated to the appropriate sites. The flagging of individuals to be translocated will take place preferably during the flowering season of the species. The translocation of individuals will be preferably performed during the dormant stage in order to minimize stresses to the plant. The data regarding date, location, source populations and number of individuals collected and translocated will be recorded. A Salvaging and Translocation Plan will be prepared based on the construction schedule. Collection and translocation techniques and suitable translocation sites will also be identified within the Plan.
- **Flora on-site conservation:** conservation of flora species determining CH and PBF, situated in the vicinity of the Project (100 m) shall be guaranteed. These areas will be clearly identified both on the maps and in the field as exclusion zones where soil and vegetation will be preserved, and access will not be permitted. Demarcation could be provided by highly visible wooden sticks (50 cm high) planted into the ground and/or flagging tape, while a more permanent fencing should be provided in areas subject to higher risk of disturbance because they are closer to active sites or downhill from ground preparation.

Fauna species determining PBF and CH

Minimization:

- **Fauna on-site conservation:** specific additional pre-construction surveys will be performed within the WF targeting birds and bats determining PBF and CH by an expert ecologist targeting nests and roosts. Similar surveys will also be conducted along the OHL for *Circaetus gallicus*. If nests or maternity roosts are found within 100m from the planned construction sites, the construction activities will be postponed until the young are able to leave the nest/roost.

7.2.3.1.3 Residual impacts

Natural Habitats and habitats triggering PBF

Considering the application of the abovementioned mitigation measures, the impact on habitat triggering PBF is presented in the following tables and it is expected to be:

- for the windfarm construction LSA: Low
- for the powerline construction LSA: Negligible

Table 37: residual impact assessment matrix for habitat triggering PBF during construction phase for the Wind Farm

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---|------------------------|-------------------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| Vegetation and topsoil removal | Duration: | Medium-short | Medium | Long term | Medium | High | Negligible |
| | Frequency: | Sporadic | | | | | |
| | Geo. Extent: | Project footprint | | | | | |
| | Intensity: | Medium | | | | | |
| Changes in local hydrology | Duration: | Medium | Medium | Mid term | Medium | High | Negligible |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Medium | | | | | |
| Increase in vehicular traffic | Duration: | Medium | Medium | Mid term | Medium | High | Negligible |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Medium | | | | | |
| Emission of noise and vibration | Duration: | Medium | Medium | Short-term | Low | Low | Negligible |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | High | | | | | |
| Introduction and spreading of alien species | Duration: | Medium | Medium | Long term | Medium | High | Negligible |
| | Frequency: | Sporadic | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Negligible | | | | | |

Table 38: residual impact assessment matrix for habitat triggering PBF during construction phase for the Overhead Line

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---|------------------------|---------------------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| Vegetation and topsoil removal | Duration: | Short | Medium-low | Mid term | Negligible | Medium | Negligible |
| | Frequency: | Sporadic | | | | | |
| | Geo. Extent: | Project footprint | | | | | |
| | Intensity: | Low | | | | | |
| Increase in vehicular traffic | Duration: | Medium-short | Medium-low | Mid term | Low | Medium-high | Negligible |
| | Frequency: | Moderately frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Low | | | | | |
| Emission of noise and vibration | Duration: | Medium-short | Medium-low | Short-term | Negligible | Low | Negligible |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Medium | | | | | |
| Introduction and spreading of alien species | Duration: | Medium-short | Medium-low | Long term | Low | Medium-high | Negligible |
| | Frequency: | Sporadic | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Negligible | | | | | |

Flora species determining PBF and CH

Considering the application of the abovementioned mitigation measures, the impact on flora species determining PBF and CH is presented in the following tables and it is expected to be:

- for flora species determining PBF in the windfarm construction LSA: Negligible
- for flora species determining CH in the windfarm construction LSA: Low

Table 39: residual impact assessment matrix for flora species determining PBF during construction phase for the Wind Farm

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---|------------------------|-------------------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| Vegetation and topsoil removal | Duration: | Medium-short | Medium | Long term | Medium | High | Negligible |
| | Frequency: | Sporadic | | | | | |
| | Geo. Extent: | Project footprint | | | | | |
| | Intensity: | Medium | | | | | |
| Changes in local hydrology | Duration: | Medium | Medium | Mid term | Medium | High | Negligible |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Medium | | | | | |
| Introduction and spreading of alien species | Duration: | Medium | Medium | Long term | Medium | High | Negligible |
| | Frequency: | Sporadic | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Negligible | | | | | |

Table 40: residual impact assessment matrix for flora species determining CH during construction phase for the Wind Farm

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|--------------------------------|------------------------|-------------------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| Vegetation and topsoil removal | Duration: | Medium-short | Medium-high | Long term | Medium | Medium-high | Low |
| | Frequency: | Sporadic | | | | | |
| | Geo. Extent: | Project footprint | | | | | |
| | Intensity: | Medium | | | | | |
| Changes in local hydrology | Duration: | Medium | Medium-high | Mid term | Medium | High | Negligible |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Medium | | | | | |

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---|------------------------|------------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| Introduction and spreading of alien species | Duration: | Medium | Medium-high | Long term | Medium | High | Negligible |
| | Frequency: | Sporadic | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Negligible | | | | | |

Fauna species determining PBF and CH

Considering the application of the abovementioned mitigation measures, the impact on fauna species determining PBF and CH is presented in the following tables and it is expected to be:

- for fauna species determining PBF in the windfarm construction LSA: Negligible
- for fauna species determining CH in the windfarm construction LSA: Low
- for fauna species determining PBF in the powerline construction LSA: Negligible
- for fauna species determining CH in the powerline construction LSA: Negligible

Table 41: residual impact assessment matrix for fauna species determining PBF during construction phase for the Wind Farm

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---------------------------------|------------------------|-------------------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| Vegetation and topsoil removal | Duration: | Medium-short | Medium | Long term | Low | Medium-high | Negligible |
| | Frequency: | Sporadic | | | | | |
| | Geo. Extent: | Project footprint | | | | | |
| | Intensity: | Low | | | | | |
| Changes in local hydrology | Duration: | Medium | Medium | Mid term | Medium | High | Negligible |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Medium | | | | | |
| Increase in vehicular traffic | Duration: | Medium | Medium | Mid term | Medium | High | Negligible |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Medium | | | | | |
| Emission of noise and vibration | Duration: | Medium | Medium | Short-term | Low | Medium | Negligible |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | High | | | | | |
| Introduction and spreading | Duration: | Medium | Medium | Long term | Medium | High | Negligible |
| | Frequency: | Sporadic | | | | | |
| | Geo. Extent: | Local | | | | | |

| | | | | | | |
|------------------|------------|------------|--|--|--|--|
| of alien species | Intensity: | Negligible | | | | |
|------------------|------------|------------|--|--|--|--|

Table 42: residual impact assessment matrix for fauna species determining CH during construction phase for the Wind Farm

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---|------------------------|-------------------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| Vegetation and topsoil removal | Duration: | Medium-short | Medium-high | Long term | Medium | Medium-high | Low |
| | Frequency: | Sporadic | | | | | |
| | Geo. Extent: | Project footprint | | | | | |
| | Intensity: | Low | | | | | |
| Changes in local hydrology | Duration: | Medium | Medium-high | Mid term | Medium | High | Negligible |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Medium | | | | | |
| Increase in vehicular traffic | Duration: | Medium | Medium-high | Mid term | Medium | High | Negligible |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Medium | | | | | |
| Emission of noise and vibration | Duration: | Medium | Medium-high | Short-term | Low | Medium | Negligible |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | High | | | | | |
| Introduction and spreading of alien species | Duration: | Medium | Medium-high | Long term | Medium | High | Negligible |
| | Frequency: | Sporadic | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Negligible | | | | | |

Table 43: residual impact assessment matrix for fauna species determining PBF during construction phase for the Overhead Line

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---|------------------------|---------------------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| Vegetation and topsoil removal | Duration: | Short | Medium | Mid term | Low | Medium | Negligible |
| | Frequency: | Sporadic | | | | | |
| | Geo. Extent: | Project footprint | | | | | |
| | Intensity: | Low | | | | | |
| Increase in vehicular traffic | Duration: | Medium-short | Medium | Mid term | Low | Medium-high | Negligible |
| | Frequency: | Moderately frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Low | | | | | |
| Emission of noise and vibration | Duration: | Medium-short | Medium | Short-term | Negligible | Low | Negligible |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Medium | | | | | |
| Introduction and spreading of alien species | Duration: | Medium-short | Medium | Long term | Low | Medium-high | Negligible |
| | Frequency: | Sporadic | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Negligible | | | | | |

Table 44: residual impact assessment matrix for fauna species determining CH during construction phase for the Overhead Line

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---------------|------------------------|-------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| | Duration: | Short | Medium-high | Mid term | Low | | Negligible |

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---|------------------------|---------------------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| Vegetation and topsoil removal | Frequency: | Sporadic | | | | Medium-high | |
| | Geo. Extent: | Project footprint | | | | | |
| | Intensity: | Low | | | | | |
| Increase in vehicular traffic | Duration: | Medium-short | Medium-high | Mid term | Medium | High | Negligible |
| | Frequency: | Moderately frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Low | | | | | |
| Emission of noise and vibration | Duration: | Medium-short | Medium-high | Short-term | Low | Medium | Negligible |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Medium | | | | | |
| Introduction and spreading of alien species | Duration: | Medium-short | Medium-high | Long term | Medium | High | Negligible |
| | Frequency: | Sporadic | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Negligible | | | | | |

7.2.3.1.4 Monitoring

Natural Habitats and habitats triggering PBF

No additional specific monitoring activities are considered necessary for these key biodiversity feature.

Flora species determining PBF and CH

- Flora salvaging: Flora translocation sites identified for flora species determining PBF and CH shall be monitored periodically for any sign of stress or disturbance. A monitoring register will be filled in and photographic documentation will be collected at each monitoring and shared with the Specialized Contractor(s)

- **Flora on-site conservation:** on-site Conservation Areas identified for flora species shall be monitored monthly during the construction phase and any signs of direct or indirect disturbance will be noted (e.g. trampling, dust deposition, soil erosion, presence of stagnant water). A monitoring register will be filled in and photographic documentation will be collected at each monitoring and shared with the Specialized Contractor(s)

Fauna species determining PBF and CH

No additional specific monitoring activities are considered necessary for these key biodiversity feature.

7.2.3.2 Operation Phase

7.2.3.2.1 Impact analysis

Natural Habitats and habitats triggering PBF

The potential impacts on Natural Habitats and habitats triggering PBF are associated with the following impact factors:

- 1) presence of new buildings/infrastructures:
- 2) changes in local hydrology:
- 3) emission of noise and vibration:
- 4) emission of light:

The general effects of impact factors were described in the previous chapter, while the potential direct and indirect impact that could occur on the individual habitats are summarized in the table below.

| Habitat type | PBF /NH /CH | Distribution | WF/ OHL | Potential direct impacts | Potential indirect impacts |
|---|-------------|---|--------------------------|---|---|
| Natural Habitats | NH | - | WF/OHL | The loss due to direct impacts is calculated as 57 ha | The indirect impacts could affect 437 ha in the 100 m buffer and 852 ha in the 300 m buffer |
| Kopaonik KBA - IBA | PBF | - | WF | The loss due to direct impacts is calculated as 20.96 ha | The indirect impacts could affect 210.90 ha in the 100 m buffer and 222.87 ha in the 300 m buffer |
| 91W0 Moesian beech forests | PBF | Found within EUNIS G1.691 (no coppice area) | WF/ OHL (higher section) | The loss due to direct impacts is calculated as 3.85 ha | The indirect impacts could affect 33.31 ha in the 100 m buffer and 59.19 ha in the 300 m buffer |
| 9410 Acidophilous <i>Picea</i> forests of the montane to alpine levels (<i>Vaccinio-Piceetea</i>) | PBF | Potentially found within EUNIS habitat G3.1E5 | WF | It is not possible to calculate exact impact since the distribution of this habitat is unknown. In the worst-case scenario, the | It is not possible to calculate exact impact since the distribution of this habitat is unknown. In the worst-case scenario, the loss could be |

| Habitat type | PBF /NH /CH | Distribution | WF/ OHL | Potential direct impacts | Potential indirect impacts |
|--|-------------|--------------------|--------------------------|--|---|
| | | | | loss could be equal to that of G3.1E5 (1.55 ha) | equal to that of G3.1E5 (17.87 ha in the 100 m buffer and 39.07 ha in the 300 m buffer) |
| E1.7 - Closed non-Mediterranean dry acid and neutral grassland | PBF | EUNIS habitat E1.7 | WF/ OHL (higher section) | The loss due to direct impacts is calculated as 38.16 ha | The indirect impacts could affect 313.70 ha in the 100 m buffer and 556.37 ha in the 300 m buffer |

Flora species determining PBF and CH

The potential impacts on flora species triggering PBF are associated with the following impact factors:

- 1) presence of new buildings/infrastructures.
- 2) changes in local hydrology.

The general effects of impact factors were described in the previous chapter, while the potential direct and indirect impact that could occur on the individual SCCs are summarized in the table below.

| Species | Common name | PBF /CH | Potential direct impacts | Potential indirect impacts |
|------------------------------|----------------------------|---------|---|---|
| | | | Area (ha)* | Area (ha)* |
| <i>Echium russicum</i> | Red-flowered viper's grass | PBF | The loss due to direct impacts is calculated as 0.16 ha (2% of the area observed on site) | 3.67 ha (46% of the area observed on site) |
| <i>Gentianella bulgarica</i> | Dwarf Bulgarian gentian | PBF | The loss due to direct impacts is calculated as 0.16 ha (3% of the area observed on site) | 3.67 ha 68% of the area observed on site) |
| <i>Daphne blagayana</i> | Blagay's Daphne | CH | The loss due to direct impacts is calculated as 5.28 ha (6% of the area observed on site) | 45.52 ha (51% of the area observed on site) |
| <i>Senecio procerus</i> | Groundsel | CH | The loss due to direct impacts is calculated as 0.3 ha (5% of the area observed on site) | 3.92 ha (68% of the area observed on site) |

*Distribution area of threatened plant species in the WF Selac Project area, determined by Biomaster Ltd. during 2018 surveys.

Fauna species determining PBF and CH

The potential impacts on fauna species triggering PBF are associated with the following impact factors:

- 1) presence of new buildings/infrastructures:
- 2) changes in local hydrology:
- 3) emission of noise and vibration:
- 4) emission of light:

The general effects of impact factors were described in the previous chapter, while the potential direct and indirect impact that could occur on the individual SCCs are summarized in the table below.

| Taxon | Species | Common name | PBF /CH | Potential direct impacts | Potential indirect impacts |
|-------------|-------------------------------|---------------------|---------|--|--|
| Coleoptera | <i>Lucanus cervus</i> | Stag beetle | PBF | Direct impacts could be associated with loss of suitable habitat mainly associated with forest areas. | Indirect impacts from the project could occur in a 100 m and 300 m buffer and are mainly associated with the possible changes in the habitat suitability because of habitat fragmentation and behavioural changes in predator species due to the presence of noise and light. |
| | <i>Rosalia alpina</i> | Rosalia longicorn | PBF | | |
| Lepidoptera | <i>Coenonympha orientalis</i> | Balkan Heath | PBF | Direct impacts could be associated with loss of suitable habitat mainly in grassland habitats, but also in forests and wetlands. | Indirect impacts from the project could occur in a 100 m and 300 m buffer and are mainly associated with the possible changes in the habitat suitability due to the effects of habitat fragmentation, changes in local hydrology and behavioural changes in predator species due to the presence of noise and light. |
| | <i>Euphydryas aurinia</i> | Marsh fritillary | PBF | | |
| | <i>Lycaena dispar</i> | Large copper | PBF | | |
| | <i>Parnassius apollo</i> | Apollo | PBF | | |
| Amphibians | <i>Bombina variegata</i> | Yellow-bellied toad | PBF | Direct impacts could be associated with loss of suitable habitat, mainly in or close to wetland habitats. | Indirect impacts from the project could occur in a 100 m and 300 m buffer and are mainly associated with changes in local hydrology and behavioural changes in predator species due to the presence of noise and light. |
| | <i>Triturus cristatus</i> | Crested newt | PBF | | |
| Reptiles | <i>Testudo hermanni</i> | Hermann's tortoise | PBF | Direct impacts could be associated with loss of suitable habitat, mainly in grassland /shrubland habitats. | Indirect impacts from the project could occur in a 100 m and 300 m buffer and are mainly associated with presence of noise and light and artificial hydrological and morphological features that could limit the species mobility within its home range. |
| Birds | <i>Alcedo atthis</i> | Common kingfisher | PBF | No direct impact is expected on this species since freshwater habitats | No indirect impact is expected on this species since freshwater habitats are not affected by the Project |

| Taxon | Species | Common name | PBF /CH | Potential direct impacts | Potential indirect impacts |
|-------|---------------------------------|-----------------------------|---------|---|--|
| | | | | are not affected by the Project | |
| | <i>Alectoris graeca</i> | Rock partridge | CH | Direct impacts could be associated with loss of suitable habitat, mainly in grassland habitats. | Indirect impacts from the project could occur in a 100 m and 300 m buffer and are mainly associated with the possible changes in the foraging areas due to the effects of habitat fragmentation and attraction or repulsion of preys and predator species due to the presence of noise and light. |
| | <i>Circaetus gallicus</i> | short-toed snake | CH | Direct impacts could be associated with loss of suitable foraging habitat. This species is also susceptible to collision and electrocution with the OHL and Windfarm. | Indirect impacts from the project could occur in a 100 m and 300 m buffer and are mainly associated with the possible changes in the foraging areas due to the effects of habitat fragmentation and attraction or repulsion of preys due to the presence of noise and light. |
| | <i>Monticola saxatilis</i> | Rufous-tailed Rock-thrush | CH | Direct impacts could be associated with loss of suitable foraging habitat. | Indirect impacts from the project could occur in a 100 m and 300 m buffer and are mainly associated with the possible changes in the foraging areas because of habitat fragmentation and attraction or repulsion of preys and predator species due to the presence of noise and light. |
| Bats | <i>Barbastella barbastellus</i> | Western Barbastelle | PBF | Direct impacts could be associated with loss of suitable foraging habitat. This species is also susceptible to collision with the OHL and Windfarm. | Indirect impacts from the project could occur in a 100 m and 300 m buffer and are mainly associated with the possible changes in the foraging areas because of habitat fragmentation and behavioural changes of prey species due to the presence of noise and light. The effect of fragmentation could be particularly important for <i>Rinolophus mehelyi</i> , as it is already patchily distributed, and <i>Rhinolophus hipposideros</i> how is known to forage |
| | <i>Miniopterus schreibersi</i> | Schreiber"s Bent-winged bat | PBF | | |
| | <i>Myotis emarginatus</i> | Geoffroy's bat | PBF | | |
| | <i>Myotis blythi</i> | Lesser Mouse-eared Myotis | PBF | | |
| | <i>Myotis capaccini</i> | Long-fingered Bat | PBF | | |

| Taxon | Species | Common name | PBF /CH | Potential direct impacts | Potential indirect impacts |
|---------|----------------------------------|-----------------------------|---------|--|---|
| | <i>Myotis myotis</i> | Greater Mouse - eared bat | PBF | | almost exclusively in woodlands and avoids open areas. |
| | <i>Nyctalus lasiopterus</i> | Giant Noctule | PBF | | |
| | <i>Rhinolophus euryale</i> | Mediterranean Horseshoe Bat | PBF | | |
| | <i>Rhinolophus ferrumequinum</i> | Greater Horseshoe bat | PBF | | |
| | <i>Rhinolophus hipposideros</i> | Lesser Horseshoe bat | PBF | | |
| | <i>Rhinolophus mehelyi</i> | Mehely's Horseshoe Bat | PBF | | |
| Mammals | <i>Canis lupus</i> | Grey wolf | PBF | Direct impacts could be associated with loss of suitable hunting habitat, however considering the home range of the species this impact is negligible. | Indirect impacts from the project could occur in a 100 m and 300 m buffer and are mainly associated with the possible changes in the foraging areas because of habitat fragmentation and attraction or repulsion of preys species due to the presence of noise. |

7.2.3.2.2 Mitigation measures

In addition to the avoidance, minimization and rehabilitation/restoration measures proposed in the section 7.2.2.2, the following measure are proposed specifically for key biodiversity features.

Natural Habitats and habitats triggering PBF

Rehabilitation/restoration:

- Restoration of pre-existing degraded areas: natural habitat not directly included into the project footprint and severely degraded by sources other than de Project (e.g. overgrazing, erosion, off-road driving) will be rehabilitated in order to increase their naturalness level, reduce the risk of invasive species spreading and control erosion. The presence of well-maintained roads will also likely discourage off-road driving which is an evident source of habitat degradation on site.

Flora species determining PBF and CH

- Flora on-site conservation: conservation of flora species determining CH and PBF, situated in the vicinity of the Project (100 m) shall be ensured including translocation areas. These areas will be by protected during the cooperation phase by impacts other than the Project such as grazing, trampling and off-road driving. If necessary, the populations will be fenced.

Fauna species determining PBF and CH

No additional specific mitigation measures are considered necessary for these key biodiversity feature.

7.2.3.2.3 Residual impacts

Natural Habitats and habitats triggering PBF

Considering the application of the abovementioned mitigation measures, the impact on habitat triggering PBF is presented in the following tables and it is expected to be:

- for the windfarm operation LSA: Low
- for the powerline operation LSA: Negligible

Table 45: residual impact assessment matrix for habitat triggering PBF during operation phase for the Wind Farm

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|--|------------------------|---------------------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| presence of building and infrastructures | Duration: | Long | Medium | Long term | High | High | Low |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Project footprint | | | | | |
| | Intensity: | Low | | | | | |
| emission of noise and vibration | Duration: | Long | Medium | Short-term | Negligible | Low | Negligible |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Negligible | | | | | |
| emission of light | Duration: | Long | Medium | Short-term | Low | Medium | Negligible |
| | Frequency: | Highly frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Low | | | | | |
| changes in local hydrology | Duration: | Long | Medium | Short-mid-term | Low | Medium-high | Negligible |
| | Frequency: | Moderately frequent | | | | | |

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---------------|------------------------|------------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Negligible | | | | | |

Table 46: residual impact assessment matrix for habitat triggering PBF during operation phase for the Overhead Line

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|--|------------------------|-------------------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| Presence of building and infrastructures | Duration: | Long | Medium | Mid term | Medium | High | Negligible |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Project footprint | | | | | |
| | Intensity: | Negligible | | | | | |
| Emission of light | Duration: | Long | Medium | Short-term | Low | Medium | Negligible |
| | Frequency: | Highly frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Negligible | | | | | |

Flora species determining PBF and CH

Considering the application of the abovementioned mitigation measures, the impact on flora species determining PBF and CH is presented in the following tables and it is expected to be:

- for flora species determining PBF in the windfarm operation LSA: Negligible
- for flora species determining CH in the windfarm operation LSA: Low

Table 47: residual impact assessment matrix for flora species determining PBF during operation phase for the Wind Farm

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|--------------------------|------------------------|------------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| Presence of building and | Duration: | Long | Medium | Long term | High | High | Negligible |
| | Frequency: | Continuous | | | | | |

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|----------------------------|------------------------|---------------------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| infrastructure s | Geo. Extent: | Project footprint | | | | | |
| | Intensity: | Low | | | | | |
| Changes in local hydrology | Duration: | Long | Medium | Short-mid-term | Low | Medium-high | Negligible |
| | Frequency: | Moderately frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Negligible | | | | | |

Table 48: residual impact assessment matrix for flora species determining CH during operation phase for the Wind Farm

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---|------------------------|---------------------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| presence of building and infrastructure s | Duration: | Long | Medium-high | Long term | High | High | Low |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Project footprint | | | | | |
| | Intensity: | Low | | | | | |
| changes in local hydrology | Duration: | Long | Medium-high | Short-mid-term | Medium | Medium-high | Negligible |
| | Frequency: | Moderately frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Negligible | | | | | |

Fauna species determining PBF and CH

Considering the application of the abovementioned mitigation measures, the impact on fauna species determining PBF and CH is presented in the following tables and it is expected to be:

- for fauna species determining PBF (except birds and bats) in the windfarm operation LSA: Low

- for fauna bird and bat species determining PBF in the windfarm operation LSA: Negligible
- for fauna bird species determining CH in the windfarm operation LSA: Low
- for fauna species determining PBF in the powerline operation LSA: Negligible
- for fauna bird species determining CH in the powerline operation LSA: Negligible

Table 49: residual impact assessment matrix for fauna species determining PBF (except birds and bats) during operation phase for the Wind Farm

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---|------------------------|---------------------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| presence of building and infrastructure | Duration: | Long | Medium | Long term | High | Medium-high | Low |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Project footprint | | | | | |
| | Intensity: | Low | | | | | |
| emission of noise and vibration | Duration: | Long | Medium | Short-term | Negligible | Low | Negligible |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Negligible | | | | | |
| emission of light | Duration: | Long | Medium | Short-term | Low | Medium | Negligible |
| | Frequency: | Highly frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Low | | | | | |
| changes in local hydrology | Duration: | Long | Medium | Short-mid-term | Low | Medium-high | Negligible |
| | Frequency: | Moderately frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Negligible | | | | | |

Table 50: residual impact assessment matrix for bird and bat species determining PBF during operation phase for the Wind Farm

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|--|------------------------|---------------------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| presence of building and infrastructures | Duration: | Long | Medium | Long term | High | High | Negligible |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Project footprint | | | | | |
| | Intensity: | Low | | | | | |
| emission of noise and vibration | Duration: | Long | Medium | Short-term | Negligible | Low | Negligible |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Negligible | | | | | |
| emission of light | Duration: | Long | Medium | Short-term | Low | Medium | Negligible |
| | Frequency: | Highly frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Low | | | | | |
| changes in local hydrology | Duration: | Long | Medium | Short-mid-term | Low | Medium-high | Negligible |
| | Frequency: | Moderately frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Negligible | | | | | |

Table 51: residual impact assessment matrix for bird species determining CH during operation phase for the Wind Farm

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---------------|------------------------|------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| | Duration: | Long | | Long term | High | High | Low |

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|--|------------------------|---------------------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| presence of building and infrastructures | Frequency: | Continuous | Medium-high | | | | |
| | Geo. Extent: | Project footprint | | | | | |
| | Intensity: | Low | | | | | |
| emission of noise and vibration | Duration: | Long | Medium-high | Short-term | Low | Low | Low |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Negligible | | | | | |
| emission of light | Duration: | Long | Medium-high | Short-term | Low | Medium | Negligible |
| | Frequency: | Highly frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Low | | | | | |
| changes in local hydrology | Duration: | Long | Medium-high | Short-mid-term | Medium | Medium-high | Negligible |
| | Frequency: | Moderately frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Negligible | | | | | |

Table 52: residual impact assessment matrix for fauna species determining PBF during operation phase for the Overhead Line

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|--|------------------------|-------------------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| presence of building and infrastructures | Duration: | Long | Medium | Mid term | Medium | High | Negligible |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Project footprint | | | | | |

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|-------------------|------------------------|-----------------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| | Intensity: | Negligible | | | | | |
| emission of light | Duration: | Long | Medium | Short-term | Low | Medium | Negligible |
| | Frequency: | Highly frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Negligible | | | | | |

Table 53: residual impact assessment matrix for fauna species determining CH during operation phase for the Overhead Line

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|--|------------------------|-------------------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| presence of building and infrastructures | Duration: | Long | Medium-high | Mid term | High | High | Negligible |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Project footprint | | | | | |
| | Intensity: | Negligible | | | | | |
| emission of light | Duration: | Long | Medium-high | Short-term | Low | Medium | Negligible |
| | Frequency: | Highly frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Negligible | | | | | |

7.2.3.2.4 Monitoring

Natural Habitats and habitats triggering PBF

No additional specific monitoring activities are considered necessary for these key biodiversity feature.

Flora species determining PBF and CH

- Flora on-site conservation: on-site Conservation Areas identified for flora species shall be monitored every three months during the vegetative, any signs of direct or indirect disturbance will be noted (e.g. trampling, dust deposition, soil erosion, presence of stagnant water). A monitoring register will be filled in and photographic documentation will be collected at each monitoring and shared with the Specialized Contractor(s)

Fauna species determining PBF and CH

No additional specific monitoring activities are considered necessary for these key biodiversity feature.

7.2.4 No Net Loss / Net Gain Assessment for Key Biodiversity Features

The present net loss assessment identifies and discusses residual and unavoidable impacts on Natural Habitats, Priority Biodiversity Features and Critical Habitats identified in the previous chapters.

Residual impacts are assessed separately for the following key biodiversity features:

- Natural Habitats (NHs);
- Habitats triggering PBF:
 - Kopaonik KBA and IBA
 - 91W0 Moesian beech forests;
 - 9410 Acidophilous Picea forests of the montane to alpine levels (Vaccinio-Piceetea);
 - E1.7 - Closed non-Mediterranean dry acid and neutral grassland.
- flora species determining CH;
 - *Daphne blagayana* (Blagay's Daphne)
 - *Senecio procerus* (Groundsel)
- fauna species determining PBF;
- fauna bird species determining CH;
 - *Alectoris graeca* (Rock partridge);
 - *Circaetus gallicus* (Short-toed snake);
 - *Monticola saxatilis*.

7.2.4.1 Natural Habitats and habitats triggering PBF

For these habitats direct impacts are mainly associated with loss in correspondence of the footprint of the Project and its associated facilities. At the end of the construction phase restoration/rehabilitation activities will be conducted on all temporary facilities such as storage areas and deposit areas, therefore the only direct impacts remaining will be those due to presence of new buildings/infrastructures.

Indirect impacts from the project could occur in a 100 m buffer and that could cause changes in the habitat suitability and with competition due to the introduction and spreading of alien species into disturbed habitats. Mitigation and monitoring measures presented for the construction and operation phase are considered sufficient for indirect impacts on populations of the species indirectly impacted.

Considering that no detailed information is available at this stage on the decommissioning and closure plan, using a precautionary approach, the net loss is calculated conservatively at the end of the operation phase.

For natural habitats the calculation was performed considering the baseline degradation level (d) present in the LSA since these habitats are already characterized by different levels of anthropogenic disturbance causing habitat degradation and loss of ecological function.

The d coefficient has a value ranging from 0.2 to 1 that express the average degradation level. The values of the coefficient are assigned for each habitat of a study area according to the following scale.

Table 54: Natural habitats degradation levels and relative d score

| Degradation level | Value | d score |
|--|-----------|-----------|
| Very high anthropogenic and/or natural disturbance | Very high | 0.2 |
| High anthropogenic and/or natural disturbance | High | 0.4 |
| Medium anthropogenic and/or natural disturbance | Medium | 0.6 |
| Low anthropogenic and/or natural disturbance | Low | 0.8 |
| No anthropogenic and/or natural disturbance | None | 1 |

The habitat equivalent (in hectares) is therefore calculated using the following equation to factor in the different d values assigned to different habitat types:

$$H eq. = \sum_{i=1}^n (a_i * d_i)$$

$H eq$ = habitat equivalents of a group of patches of a given habitat type.

a_i = The area of the i^{th} habitat patch.

d_i = The degradation coefficient of the i^{th} habitat patch (coefficient ranging from 0-1).

This equation is used to calculate the total habitat loss as quality habitat equivalents considering the different levels of habitat degradation. However, the same equation could also be used as an accounting methodology to calculate the positive effects deriving from eventual offsets activities that are planned to act on degradation factors.

The expected net loss of natural habitats and habitats determining PBFs in hectares equivalents associated with the Project is calculated using the methodology given above.

The net loss calculated is quite low compare to the total LSA (<1%). The total net loss is calculated as 56.29 ha or 25.29 qu ha.

Considering the limited footprint of the Project and the extension of the natural habitats impacted in their areas of distribution, it is not expected that the Project will have significant adverse impacts on natural habitats.

Table 55: potential Net Loss of Natural Habitats

| Habitat type | Degrad. level (d) | Total area (ha) | Net Loss (ha) | Total area (qu ha) | Net Loss (qu ha) | % of loss in LSA |
|---|-------------------|-----------------|---------------|--------------------|------------------|------------------|
| C2.3 - Permanent non-tidal, slow, smooth-flowing watercourses | 0.6 | 5.23 | - | 3.14 | - | - |
| E1.7 - Closed non-Mediterranean dry acid and neutral grassland | 0.4 | 4205.57 | 38.09 | 1682.23 | 15.24 | <1 |
| E1.A - Open Mediterranean dry acid and neutral grassland | 0.4 | 135.03 | 0.11 | 54.01 | 0.04 | <0.1 |
| F3.2 - Sub-Mediterranean deciduous thickets and brushes | 0.6 | 149.91 | 0.27 | 89.95 | 0.16 | <1 |
| G1.691 - Southwestern Moesian beech forests | 0.8 | 478.47 | 3.84 | 382.75 | 3.07 | <1 |
| G1.691 - Southwestern Moesian beech forests (coppice) | 0.4 | 2568.9 | 6.32 | 1027.56 | 2.53 | <1 |
| G1.762 - Helleno-Moesian <i>Quercus frainetto</i> forests (coppice) | 0.4 | 229.9 | 5.49 | 91.96 | 2.20 | 2 |
| G1.762 - Helleno-Moesian <i>Quercus frainetto</i> forests | 0.8 | 46.58 | - | 37.26 | - | - |
| G1.763 - Helleno-Moesian <i>Quercus dalechampii</i> forests | 0.8 | 497.03 | 0.62 | 397.62 | 0.50 | <1 |
| G3.1E5 - Balkan Range <i>Picea abies</i> forests | 1 | 70.01 | 1.55 | 70.01 | 1.55 | 2 |
| G3.4C - South-eastern European <i>Pinus sylvestris</i> forests | 1 | 30.6 | - | 30.6 | - | - |
| Total | | 8417.23 | 56.29 | 3867.09 | 25.29 | <1 |

For habitats triggering PBF the net loss calculated is equally quite low compare to the total LSA. In fact, it could exceed 1% only for “9410 Acidophilous *Picea* forests of the montane to alpine levels (*Vaccinio-Piceetea*)”, although the presence of this habitat has not been confirmed. Impacts and habitat losses on the species triggering the definition of the Kopaonik IBA have been assessed separately and are considered not significant.

Considering the limited footprint of the Project and the extension of the habitat impacted, it is not expected that the Project will have significant adverse impacts on these habitats.

It is important to highlight that both hectare and hectare equivalent calculations were performed without considered the benefit of restoration and closure. Once a “Restoration and Closure Plan” is prepared with realistic objectives and targets, the positive effects are expected to sensibly lower the total Net Loss calculated for the Project.

Table 56: potential Net Loss of habitats determining PBF

| Habitat type | Total area (ha) | Net Loss (ha) | % of loss |
|---|-----------------|---------------|-----------|
| Kopaonik KBA - IBA | 73822.47 | 20.96 | <0.1 |
| 91W0 Moesian beech forests | 478.47 | 3.85 | <1 |
| 9410 Acidophilous <i>Picea</i> forests of the montane to alpine levels (<i>Vaccinio-Piceetea</i>) | 70.01 | 1.55 | 2.21 |
| E1.7 - Closed non-Mediterranean dry acid and neutral grassland | 4205.57 | 38.09 | <1 |

7.2.4.2 Flora species determining CH

For these species direct impacts are mainly associated with loss of populations present under the footprint of the Project and its associated facilities. Since little is known about the ecological requirements of these flora species, using a precautionary approach, it is considered that it will not be possible to restore the specific ecological niche of the species triggering CHs directly impacted by the Project. Moreover, considering that the translocation of natural species in the wild is not always successful and no information are available at the moment on the survival rate of these particular species, the potential positive effects of these actions were not considered at present.

The net loss is therefore calculated conservatively as the area affected by direct impacts at the end of the construction phase or in the worst-case scenario based on current knowledge of the species distribution.

Indirect impacts from the project could occur in a 100 m buffer and are mainly associated with the possible changes in local hydrology that could cause changes in the habitat suitability and with competition due to introduction and spreading of alien species into disturbed habitats. Mitigation and monitoring measures presented for the construction and operation phase are considered sufficient for indirect impacts on populations of the species indirectly impacted.

The net loss of flora species determining CH was estimated based on current information as 7.53 ha (9% of the area where the species has been detected) for *Daphne blagayana* and 0.96 ha (17% of the area where the species has been detected) for *Senecio procerus*.

Using a precautionary approach, these numbers do not consider the positive effect of "Flora Salvaging" activities since little is known on the species survival rate. It is also likely that other populations of these species exist in the LSA since field studies were limited to the Project footprint and its immediate vicinity. Therefore, the calculated net loss percentage it is not to be interpreted as an indication of the loss in the LSA.

It must be noted that these species, although considered endangered in Kosovo, have a quite wide distribution range in Europe (chapter 6.3.7) were they are not considered threatened.

Table 57: potential Net Loss of flora species determining CH

| Species | Common name | Total area (ha) | Net Loss (ha) | % of the area where the species has been detected |
|-------------------------|-----------------|-----------------|---------------|---|
| <i>Daphne blagayana</i> | Blagay's Daphne | 88.51 | 7.53 | 9% |
| <i>Senecio procerus</i> | Groundsel | 5.75 | 0.96 | 17% |

*Distribution area of threatened plant species in the WF Selac Project area, determined by Biomaster Ltd. during 2018 surveys.

The feasibility and long-term success of “Flora Salvaging” measures need to be monitored to assess if the measure suggested within the ESIA is sufficient to ensure No Net Loss/Net Gain of flora species directly impacted by the Project.

In case the results of the monitoring will show that “Flora Salvaging” measures will not be sufficient, additional offset measures will be implemented. These measures could include:

- a) protection of existing populations that could be otherwise threatened by impacts other than the Project (e.g. overgrazing, developments);
- b) reinforcement of existing populations and /or creation of new populations using seeds or other propagules sustainably collected in the wild, preferably passing through a stage of multiplication and growing in a controlled environment.

If necessary, these activities will be performed in collaboration with local research centre and institutions (e.g. Nature Protection Agency, Botanical Garden, University) to identify the multiplication and translocation protocols and ensure ongoing protection and monitoring of the populations.

7.2.4.3 Fauna species determining PBF and CH

During the operation of the windfarm residual impacts are expected for fauna species determining PBF and bird species determining CH (*Alectoris graeca*, *Circaetus gallicus* and *Monticola saxatilis*). These impacts are mainly connected with the loss of suitable habitat due to the presence of permanent facilities during operation.

Mitigation measure proposed for the wind farm are considered sufficient to mitigate the specific risk of collision for bird and bats to negligible levels. In particular, for the Short-toed snake eagle (*Circaetus gallicus*) the collision risk assessment predicted a negligible impact. Very conservative mitigation and monitoring measure will be applied for bat species in order to make sure that the mortality will be maintain to a minimum of less than 2 dead bats per turbine (Behr et al., 2017).

Since the habitat loss due to the Project is limited, impacts on fauna species are expected to be low. It must be noted that these species have a quite wide distribution range (chapter 6.3.7) and are not considered to be endangered at global level. Only *Rosalia alpina*, *Coenonympha orientalis*, *Parnassius apollo*, *Streptopelia turtur* and *Myotis capaccini* are listed as vulnerable (VU).

Table 58: potential Net Loss of habitat for selected fauna species determining PBF and CH

| Taxon | Species | Common name | PBF /CH | Potential Net Loss of habitat |
|-------------|-------------------------------|------------------|---------|--|
| Coleoptera | <i>Lucanus cervus</i> | Stag beetle | PBF | Loss of suitable habitat mainly associated with forest areas. |
| Lepidoptera | <i>Coenonympha orientalis</i> | Balkan Heath | PBF | Loss of suitable habitat mainly in grassland habitats, but also in forests and wetlands. |
| | <i>Euphydryas aurinia</i> | Marsh fritillary | PBF | |
| | <i>Lycaena dispar</i> | Large copper | PBF | |
| | <i>Parnassius apollo</i> | Apollo | PBF | |

| Taxon | Species | Common name | PBF /CH | Potential Net Loss of habitat |
|------------|---------------------------------|---------------------------|---------|--|
| Amphibians | <i>Bombina variegata</i> | Yellow-bellied toad | PBF | Loss of suitable habitat, mainly in or close to wetland habitats. |
| | <i>Triturus cristatus</i> | Crested newt | PBF | |
| Reptiles | <i>Testudo hermanni</i> | Hermann's tortoise | PBF | Loss of suitable habitat, mainly in grassland /shrubland habitats. |
| Birds | <i>Alectoris graeca</i> | Rock partridge | CH | Loss of suitable habitat, mainly in grassland habitats. |
| | <i>Circaetus gallicus</i> | Short-toed snake | CH | Loss of suitable foraging habitat. |
| | <i>Monticola saxatilis</i> | Rufous-tailed Rock-thrush | CH | Loss of suitable foraging habitat. |
| Bats | <i>Tadarida teniotis</i> | European free tailed bat | PBF | Direct impacts could be associated with loss of suitable foraging habitat. |
| | <i>Rhinolophus hipposideros</i> | Lesser Horseshoe bat | PBF | |
| | <i>Rinolophus mehelyi</i> | Mehely's Horseshoe Bat | PBF | |

In order to offset any loss due to the Project, in addition to the mitigation measures already suggested, additional offset measures will be implemented. These measures include:

- Restoration/creation of small wetland habitats: numerous natural springs are present in the LSA, many of them result altered by anthropic infrastructure or to ensure livestock an easy access to water. Wetlands are important habitat for many wild species including insects, amphibians and reptiles and are in general characterized by a higher level of biodiversity and productivities compared to the surrounding environment. Therefore, it is suggested that at least 4 wetlands are created or restored in the LSA (at a sufficient distance from the project area) in order to compensate for those destroyed during construction.
- Artificial roosting boxes (bat-boxes) will be installed to provide supplementary roosting habitat. Bat boxes will be placed in suitable habitats outside the project area and will be monitored to check their use. As the lack of roosting site is a limiting factor for bats due to the scarcity of old hollow trees in managed forests and the competition with other species, this measure is considered effective to increase the suitability of a habitat, especially in rural areas characterized by fragmented and modified habitats.
- Educational activities will be performed in villages and local schools with the aim of sensitizing the population on the protection of local fauna and the potential damage of illegal practices such as poaching and burning of vegetation. Taxa often not considered positively such as bats reptile and amphibians, as well as birds like raptors that are often subject to poaching, will be the main focus of the educational activities.

7.2.5 Conclusions

Impacts on general biodiversity, including flora fauna and habitats, were assessed for construction and operation phase.

Specific impacts on Key Biodiversity Features, including Natural Habitats, Priority Biodiversity Features and Critical Habitats were discussed separately considering additional specific mitigation and monitoring measures.

The residual impact value calculated for general biodiversity, and for Key Biodiversity Features, including Natural Habitats, Priority Biodiversity Features and Critical Habitats are summarized in the table below. During the operation phase the residual impacts of the wind farm were considered separately for bird and bats due to the specific impacts and mitigation measure planned for these components.

As a result of the assessment only negligible or low residual impacts were identified for these components.

| Components | Project Phase | Sub- components | WF/ OHL | Residual impact value |
|---------------------------|---------------|--|---------|-----------------------|
| General biodiversity | Construction | General biodiversity | WF | Low |
| | | | OHL | Negligible |
| | Operation | General biodiversity (excluding bird & bat) | WF | Low |
| | | General biodiversity (bird & bat) | WF | Negligible |
| | | General biodiversity | OHL | Negligible |
| Key Biodiversity Features | Construction | Natural Habitats and Habitats triggering PBF | WF | Negligible |
| | | | OHL | Negligible |
| | | Flora species determining PBF | WF | Negligible |
| | | Flora species determining CH | WF | Low |
| | | Fauna species determining PBF | WF | Negligible |
| | | | OHL | Negligible |
| | | Fauna species determining CH | WF | Low |
| | | | OHL | Negligible |
| | Operation | Natural Habitats and Habitats triggering PBF | WF | Negligible |
| | | | OHL | Negligible |
| | | Flora species determining PBF | WF | Negligible |
| | | Flora species determining CH | WF | Low |
| | | Fauna species determining PBF (excluding bird & bat) | WF | Low |
| | | Fauna species determining PBF (bird & bat) | WF | Negligible |
| | | Fauna species determining PBF | OHL | Negligible |
| | | Fauna species determining CH (birds) | WF | Low |
| OHL | Negligible | | | |

A No Net Loss /Net Gain Assessment is performed for those Key Biodiversity Features that could still have non-negligible residual impacts, even considering the application of additional mitigation measures. Residual impacts were therefore assessed separately for the following Key Biodiversity Features:

- flora species determining CH;
- fauna species determining PBF and CH.

For Natural Habitats and Priority Biodiversity Features determined by fauna species, considering the limited footprint of the Project and the large geographic extension of the habitats impacted, it is not expected that the Project will have significant, adverse and irreversible impacts.

Critical Habitat determined by flora species (*Daphne blagayana* and *Senecio procerus*) might be subject to a net loss depending on the long-term success of the “Flora Salvaging” measures described above.

Critical Habitat determined by fauna species might be subject to a net loss due to the degradation of habitat. However, the degradation is not considered to reach an extent where the ecological integrity or biodiversity importance is compromised, due to the large geographic extension of the trigger species’ distribution range and the available suitable habitat within the distribution range.

An offset strategy and eventually an Offset Management Plan or the definition of additional conservation measures will be developed in case monitoring results of the “Flora salvaging” measures for flora species determining CH will show that they are not effective to achieve no net loss/net gain in a reasonable amount of time (3 years).

Additional conservation measures for bats species will be developed in case the results of monitoring of bats mortality will show significant effects, defined as a mortality above 2 individuals/turbine/year. These measures might include support to bats conservation off-site like roosts protection and enhancement, and awareness raising at the local and national level in cooperation with local qualified NGOs.

7.3 Identification of the impacts for social components

7.3.1 Economy, employment and livelihood

7.3.1.1 Construction phase

7.3.1.1.1 Impact Analysis

The following **project actions** will generate impact factors on the economy, employment and livelihood component during the construction phase:

- Land acquisition;
- Mobilization of vehicles, workers and equipment, transport of materials and waste;
- Surface levelling and grading;
- Construction of the wind turbine foundations;
- Construction of OHL pylon foundations;
- Construction of deposit areas.

The potential impacts on economy, employment and livelihood deriving from the above actions are associated with the following **impact factors**:

- Change in the local hydrology;
- Demand for freshwater;
- Change in land use and ownership;
- Demand for workforce;
- Demand for goods, materials and services.

Potential negative impacts due to the Project during this phase are essentially generated by the impact factor change in land use and ownership; this impact is assessed in more detail in section 7.3.3.1. In addition, impacts on agriculture and herding activities may be due to changes in the local hydrology and demand for freshwater, which may have effects on irrigation and on water availability for animals. However, this aspect has been assessed in the sections on hydrology and surface water. Please refer to these sections for further information on the potential negative impacts during this phase.

The project will also potentially generate positive impacts due to the demand for workforce and the demand for good, materials and services.

The Contractor who is going to implement the Project will hire staff locally, nationally or internationally, according to the skills required and the availability of workforce.

The Project, to the extent possible, will supply its workforce from local communities (i.e. communities within the municipalities of Mitrovice and Vushtrri where the Project is located). Contractors will be contractually required to maximise use of local workforce in the Project. As indicated in chapter 3.7 of the present ESIA, an estimate of the workforce needed during the construction phase is provided in the table below.

Table 59: Workforce employed during construction

| Activity | Workers | Origin |
|------------------------------|------------------------------|------------------|
| Road construction | max. 40 workers | no expats so far |
| Foundation construction | 20 workers | expats only |
| Internal cable route: | 3 teams with 5 members = 15 | no expats |
| OHL | 3 teams with 30 members = 90 | no expats |
| Engineering and office staff | 7 members | no expats |
| Security | Max 10 workers | no expats |

It is expected that at peak of construction activities, approx. 200 workers will be needed for the construction of the WF and OHL. At a local level, employment opportunities will mainly be for semi-skilled and unskilled workers; based on the table provided above, main activities that where local workforce could be used is road construction, internal cable route, OHL construction and security services. It is anticipated that there will be no need for a workers' camp related to the implementation of the Project, since the Contractor has already in its organic structure the necessary specialist workers and, as stated above, the need will be for a number of unskilled ones. This will avoid creating the typical tensions between workers in camps and the local communities.

Also, the indirect employment have to be taken into consideration in this phase that might be associated with:

- The project's supply chain (goods and services);
- Spending of project employees in local communities.

The Project will generate economic opportunities linked to the demand of goods, materials and services. The Pylons and Wind Farms will be imported and will be transported using the existing infrastructure, but it is highly likely that materials needed for civil works (i.e. cement, clay), as well as the materials needed for infrastructure improvements (i.e. for the upgrading of access tracks) will be procured locally.

There is no available data from which to estimate levels of indirect employment and indirect economic opportunities generated by the Project in Kosovo and the impacts will depend on the nature of the local economy, the availability of required goods and services in the Project area and ways in which employees choose to spend their earnings.

Construction activities may create employment related expectations among the local population, which are unrealistic. If this is not managed appropriately, it could lead to worsened relationships between the Project and the local population, once these expectations do not materialise.

7.3.1.1.2 Enhancement measures

The following measures required by EBRD PR 2 will be implemented during the construction phase for the economy, employment and livelihood component:

- Put in place transparent and fair recruitment procedures;
- Adopt and maintain human resources policies and management systems or procedures with the requirements of PR 2 and national law. These policies and procedures will be understandable and accessible to workers, and in the main language(s) spoken by the workforce. HR policies and management will ensure:
 - Non-discrimination and equal opportunities to all workers;
 - Compliance with national laws and international standards regarding employment of minors;
 - Avoidance of any form of forced labour;
- Ensure that workers are not discouraged from forming or joining workers' organisations;
- Provide clear and transparent information on wages, benefits and working conditions;
- Provide workers with a safe and healthy work environment;
- Implement a grievance mechanism open to employee and non-employee workers. Ensure that all workers directly and indirectly employed are informed about this channel to submit grievances. Ensure that the grievance mechanism is managed in line with indications of the SEP and that appropriate budget and resources are assigned.

These same measures will be applicable to non-employee workers. The company will monitor employee standards of its contractors throughout the lifetime of the Project through regular labour and OHS audits.

In addition, the following enhancement measures will be implemented to increase Project benefits on the economy, employment and livelihood component:

- The Proponent will have a strategy for the employment for the local workers. This strategy will be illustrated during the ESIA disclosure period and during following engagement activities, to ensure that local communities are informed on employment positions available and methods to express interest. Based on outcomes of this plan the Company will implement a training programme for the local workforce to enable them to take advantage of the opportunity.
- Contractors will be contractually required to maximise use of local workforce in the Project;
- In order to increase the project's Local Contents, the Company will aim to procure goods, services and materials from local businesses to the extent possible;

- A strategy for the procurement of goods, services and materials will be prepared, including a demand-and-supply analysis, in order to identify to what extent local sources can contribute to procurement needs and to implement tailored measures to support local businesses;
- The Company will provide information on procurement, tendering, and contracting processes with a transparent and clear approach, to ensure that equal access to opportunities is guaranteed;
- Information on procurement opportunities will be given to local businesses, through tailored communication with Chambers of Commerce, Industry Associations, Local authorities and other appropriate parties;
- Local companies identified as able to provide goods, materials and services in the during the strategic analysis will be contacted directly providing information on tendering opportunities;
- Local authorities and local communities will be informed and consulted on impacts due to project activities and planned mitigation measures during the pre-construction meetings and throughout the Project life cycle as planned in the Stakeholder Engagement Plan;

7.3.1.1.3 Residual impacts

Considering the application of the abovementioned enhancement measures, the impact on the economy, employment and livelihood component is depicted in the following table and it is expected to be **positive** and **medium** both for the WF and OHL area.

Table 60: WF and OHL area - residual impact assessment matrix for the economy, employment and livelihood component during the construction phase

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Enhancement effectiveness | Residual impact value |
|--|------------------------|-----------------|-----------------------|---------------------------------|--------------|---------------------------|-----------------------|
| Demand for workforce | Duration: | Medium | Medium | Short-mid-term | Medium | Medium-low | Medium |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Beyond regional | | | | | |
| | Intensity: | Low | | | | | |
| Demand for goods, materials and services | Duration: | Medium | Medium | Short-mid-term | Medium | Medium-low | Medium |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Beyond regional | | | | | |
| | Intensity: | Medium | | | | | |

7.3.1.1.4 Monitoring

The following monitoring activities will be performed to ensure the implementation and effectiveness of the proposed enhancement measures:

- Verification of the percentage of local population employed in the Project;
- Verification of the percentage of local businesses providing goods, materials and services for the Project;
- Verification of the number of grievances received and percentage of grievances resolved positively.

7.3.1.2 Operation Phase

7.3.1.2.1 Impact Analysis

The following **project actions** will generate impact factors on the economy, employment and livelihood component during the operation phase:

- Operation and maintenance of the WF;
- Operation and maintenance of the OHL;

The potential impacts on economy, employment and livelihood deriving from the above actions are associated with the following **impact factors**:

- Demand for workforce;
- Demand for goods, materials and services;
- Production of energy.

Employment during this period on both direct and indirect directions, will be limited and will consist essentially in few workers dedicated to the operation of the WF and OHL and workers periodically contracted for maintenance activities. Workers in this phase will be skilled and will be, to the extent possible, hired from local communities (i.e. communities within the municipalities of Mitrovica and Vushtrri, where the Project is located). In order to increase local employment opportunities, the Company will implement a program to train local staff, to support them in gaining the skills needed for the operation phase.

- As indicated in chapter 3.7 of the present ESIA, an estimate of the workforce needed during the operation phase is provided in the table below; it is expected that approximately 30 workers will be needed during this phase.

Table 61: Workforce employed during operation

| Activity | Workers | Origin |
|------------------------------|--|-----------|
| WF operation team | 1 Manager of the WF 2/3 Operators 2/3 Maintenance technicians | no expats |
| Substation: | 2 teams with 7 members = 14 approx. 5 technicians and engineers | no expats |
| Engineering and office staff | 7 members | no expats |

Likewise, the need for goods, materials and services will be limited, and will essentially consists in products necessary for the periodic maintenance of the WF. To date, it is not known where these materials will be sourced from. The Company will prepare a strategy and implement activities to increase local procurement and to support the creation of a local supply chain that can provide products and services needed for the periodic maintenance of the WF.

Production of energy during the operation phase will lead to general benefits on Kosovo's energy market, increasing the amount of energy available to businesses, industries and families, and decreasing the dependence on fossil sources. Works on the OHL and the substation will introduce new infrastructures and will overall improve the power transmission network.

Representatives of the communities mentioned that the construction of the WF may be accompanied by increased tourism opportunities in the area, considering this is one of the first plants to be built. While there are no clear conclusions whether the presence of WF can have positive effects on the tourism sector, if specifically managed by the Proponent through the organization of activities, for example with schools, some forms of tourism could be encouraged.

7.3.1.2.2 Enhancement measures

The following measures required by EBRD PR 2 will be implemented during the operation phase for the economy, employment and livelihood component:

- Put in place transparent and fair recruitment procedures;
- Adopt and maintain human resources policies and management systems or procedures with the requirements of PR 2 and national law. These policies and procedures will be understandable and accessible to workers, and in the main language(s) spoken by the workforce. HR policies and management will ensure:
 - Non-discrimination and equal opportunities to all workers;
 - Compliance with national laws and international standards regarding employment of minors;
 - Avoidance of any form of forced labour;
- Ensure that workers are not discouraged from forming or joining workers' organisations;
- Provide clear and transparent information on wages, benefits and working conditions;
- Provide workers with a safe and healthy work environment;
- Implement a grievance mechanism open to employee and non-employee workers. Ensure that all workers directly and indirectly employed are informed about this channel to submit grievances. Ensure that the grievance mechanism is managed in line with indications of the SEP and that appropriate budget and resources are assigned.

These same measures will be applicable to non-employee workers. The company will monitor employee standards of its contractors throughout the lifetime of the Project through regular labour and OHS audits.

In addition, the following enhancement measures will be implemented to increase Project benefits on the economy, employment and livelihood component:

- The Company will implement a program to train local staff, to support them in gaining the skills needed for the operation phase;
- In order to increase the project's Local Contents, the Company will aim to procure goods, services and materials from local businesses to the extent possible;
- A strategy for the procurement of goods, services and materials will be prepared, including a demand-and-supply analysis, in order to identify to what extent local sources can contribute to procurement needs and to implement tailored measures to support local businesses;
- Local companies identified as able to provide goods, materials and services in the during the strategical analysis will be contacted directly providing information on tendering opportunities;
- Local authorities and local communities will be informed and consulted on impacts due to project activities and planned mitigation measures during the pre-construction meetings and throughout the Project life cycle as planned in the Stakeholder Engagement Plan;

7.3.1.2.3 Residual impacts

Considering the application of the abovementioned enhancement measures, the impact on the economy, employment and livelihood component is depicted in the following tables and it is expected to be **positive** and of **medium** both for the WF and OHL area.

Table 62: WF and OHL area - residual impact assessment matrix for the economy, employment and livelihood component during the operation phase

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Enhancement effectiveness | Residual impact value |
|--|------------------------|-----------------|-----------------------|---------------------------------|--------------|---------------------------|-----------------------|
| Demand for workforce | Duration: | Long | Medium | Short-mid-term | Medium | Low | Medium |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Beyond regional | | | | | |
| | Intensity: | Negligible | | | | | |
| Demand for goods, materials and services | Duration: | Long | Medium | Short-mid-term | Medium | Low | Medium |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Beyond regional | | | | | |
| | Intensity: | Negligible | | | | | |
| Production of energy | Duration: | Long | Medium | Short-term | Low | Low | Low |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Beyond regional | | | | | |
| | Intensity: | Medium | | | | | |

7.3.1.2.4 Monitoring

The following monitoring activities will be performed to ensure the implementation and effectiveness of the proposed enhancement measures:

- Verification of the percentage of local population employed in the Project;
- Verification of the percentage of local businesses providing goods, materials and services for the Project;
- Verification of the number of grievances received and percentage of grievances resolved positively.

7.3.2 Education

7.3.2.1 Construction phase

7.3.2.1.1 Impact Analysis

The following **project action** will generate impact factors on the education component during the construction phase:

- Mobilization of vehicles, workers and equipment, transport of materials and waste.

The potential impacts on education deriving from the above actions are associated with the following **impact factor**:

- Increase of traffic.

During the construction phase, the increase of traffic along local roads can lead to disruptions and difficulties for students to reach schools.

7.3.2.1.2 Mitigation measures

For the mitigation of impacts on the education component all measures proposed for transportation and traffic component have to be applied. In addition, the mitigation measures listed below will be implemented for the construction phase for the education component according to the mitigation hierarchy:

- **Avoidance:**
 - Avoid performing transport with Heavy Good Vehicles during the period when students enter and exit schools;
- **Minimization:**

- Cooperate and coordinate with local school facilities to minimize impacts on access to schools for students.

7.3.2.1.3 Residual impacts

Considering the application of the abovementioned mitigation measures, the impact on the education component is depicted in the following table and it is expected to be **negative** and **negligible** both for the WF and OHL area.

Table 63: WF and OHL area - residual impact assessment matrix for the education component during the construction phase

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---|------------------------|-----------------|-----------------------|---------------------------------|-------------------|--------------------------|-----------------------|
| Increase of traffic | Duration: | Medium | Medium-low | Short-term | Negligible | Medium | Negligible |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Beyond regional | | | | | |
| | Intensity: | High | | | | | |
| Interruption/limitation of infrastructures/services | Duration: | Medium | Medium-low | Short-term | Negligible | Medium | Negligible |
| | Frequency: | Sporadic | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Medium | | | | | |

7.3.2.1.4 Monitoring

The following monitoring activity will be performed to ensure the implementation and effectiveness of the proposed mitigation measures:

- Verification of the number of grievances received and percentage of grievances resolved positively.

7.3.2.2 Operation Phase

7.3.2.2.1 Impact Analysis

No project actions will generate impact factors on the education component during the operation phase, therefore the impact assessment is not performed in this phase.

7.3.3 Land use and ownership

7.3.3.1 Construction phase

7.3.3.1.1 Impact Analysis

The following **project actions** will generate impact factors on the land use and ownership component during the construction phase:

- Land acquisition;
- Surface levelling and grading.

The potential impacts on land use and ownership deriving from the above actions are associated with the following **impact factor**:

- Change in land use and ownership.

For the construction and operation of the Project, the following land requirements are planned:

- **Land Acquisition:** land required by the Project for installing of permanent facilities.

- **Rent:** land required by the Project during construction activities will be temporary rented.
- **Servitude (Easement):** a right by which a piece of land, owned by one person is subject to a specified use or enjoyment by another. The servitude may imply the restriction to use the land, such as building, planting trees, right of way for internal cabling system and maintenance etc.

It should be noted that no displacement of houses or of people is necessary for this Project.

The tables below show the extension of the land required according to the three definitions provided above:

Table 64: Permanent Land Requirement

| Facility | Land Access | Surface (m ²) |
|----------------------------|-------------|---------------------------|
| Rotor 137 m – Diameter | Acquisition | 398 003 |
| Rotor 19.8 m – Diameter | Acquisition | 8 313 |
| Access Roads | Acquisition | 113 692 |
| Access Roads (Alternative) | Acquisition | 15 713 |
| OHL Pylons Footprint | Acquisition | 9 264 |
| OHL Selac Sub-Station | Acquisition | 1 320 |
| OHL Access Roads | Acquisition | To be defined |

Table 65: Rented land

| Facility | Land Access | Surface (m ²) |
|------------------------------------|-------------|---------------------------|
| Storage Area (Wind Farm) | Rent | 51 971 |
| Crane Pad (Wind Farm) | Rent | 154 839 |
| Storage Area for OHL | Rent | *To be defined |
| Other temporary Facilities for OHL | Rent | *To be defined |

Table 66: Servitude (Easement)

| Facility | Land Access | Surface (m ²) |
|------------------------|-------------|---------------------------|
| OHL Servitude corridor | Servitude | 299 072 |
| WF Internal Cabling | Servitude | 18 215 |

Three main typologies of impacts will occur during this phase, according to the different project needs in terms of land use.

- **Land necessary for permanent facilities:** these plots of land will be acquired from current land owners and will permanently change their status (at least for the entire construction and operation phase), hence it will not be possible to conduct current activities, such as farming or animal grazing; land owners and land users will be compensated for the losses, as further explained below.

- **Land necessary for temporary facilities:** these plots of land will be rented from current land owners and will be used during the construction phase. Hence it will not be possible to conduct current activities, such as farming or animal grazing, for a certain period of time, which may be equal to the entire construction period or shorter. Construction is expected to last 18 months, but certain activities may require a shorter time. This means that either one season's crops or no crops will be affected (depending on the season in which construction is carried out on a particular plot). Land owners and land users will be compensated for the temporary occupation of land and for the loss of crops, as further explained below. Rented land will then be handed back to owners after the end of construction and reinstatement, in its original conditions, to the extent possible.
- **Servitude:** along the OHL right of way land will be subject to a servitude, which will imply restrictions on the activities that can be performed. This means that generally current land uses will not be affected, however some potential future uses may be limited. The servitude will be valid for the entire operation phase of the Project. Land owners and land users will be compensated, as further explained below.

The following groups will be affected by changes in land use:

- Persons who own the land plots which will be acquired for the project, and whose land and crops may be affected by construction;
- Persons who are using the land plots which will be crossed during the transport and installation of the pylons in their future locations or other land which may be disrupted during construction, whose crops may be affected;
- Persons who are using the land plots which have been or will be acquired for the project, but who are not owners of land, and whose crops may be affected by construction.

Table 67 - Land impact

| Components | Commune | No of affected Households | No of affected parcels | Total acquisition area (m ²) | Total servitude area (m ²) | Total rent area (m ²) |
|----------------------|-----------|---------------------------|------------------------|--|--|-----------------------------------|
| WF+ other facilities | Mitrovicë | 33 | 138 | 535,721 | 18,215 | 206,810 |
| OHL | Mitrovicë | 68 | 132 | 5,943 | 121,872 | TBD |
| | Vushtrri | 131 | 193 | 3,996 | 156,942 | TBD |
| Total project | | 232 | 463 | 545,660 | 297,029 | 206,810 |

According to the results of the baseline study, renting of privately owned land is rare in the area and therefore the likelihood of the existence of users of land, who are not owners, is small. In any case, as indicated in the LALRF, land users that are not land owners will be compensated for losses of crops, pasture or forest.

The existence of individuals using the land without the knowledge of the owners has not been identified during baseline studies, hence is not expected to occur within the Aol.

Those who are going to be more affected are obviously the land owners. Some of them have more than one parcel or plot affected by the Project and, in this case, the impact will be higher than for those partially affected or affected only by the Easement.

Land that will be permanently acquired, temporarily rented or subject to servitude will be compensated to land owners and land users in line with the indications of the Land Acquisition and Livelihood Restoration Framework (LALRF), prepared in line with National Legislation and EBRD and IFC Standards. In addition, compensations will be provided when project impacts will occur on crops, trees, pastures and other assets present within the Project footprint, both for permanently acquired and temporarily rented land. The application of the LALRF will reduce to the extent possible impacts on the livelihood of current land owners and users.

Impacts are expected to be more significant within the OHL footprint than within the WF footprint. According to baseline results, in general terms farming activities are increasingly performed at lower altitudes, hence in areas that will be used for the OHL pylons. The area of the WF is instead located at higher altitudes, where limited farming or economic activities are performed, and land is mainly used for grazing activities.

Impacts will occur on Serb owners who do not live anymore in Kosovo; the Proponent will implement all actions needed to identify these owners and to inform them about the project, however there is a high possibility that the identification process proves to be unsuccessful, due to the lack of channels of information, or in some cases, due to the fact that they might be even deceased. In such case it may be possible that these individuals may not be compensated in line with the indications of the LALRF.

During the upgrading of access tracks, as well as a result of increased traffic, particularly the presence of heavy vehicles some of the local farmers may have temporary difficulties accessing their plots of land. In such way the magnitude of the impact might be higher in temporary land plot use and in perception. This impact it may occur only occasionally, under certain circumstances, but nevertheless it will be managed to prevent impacts on livelihoods and preserve good community relations.

7.3.3.1.2 Mitigation measures

The mitigation measures listed below follow the mitigation hierarchy and will be performed for the construction phase for land use and ownership component:

■ **Avoidance:**

- When selecting the siting of project elements, construction sites and access roads, avoid to the extent possible locating them on farmed land or land with the presence of fruit trees or other assets;
- Minimize the amount of land occupied during construction;
- Position OHL pylons near edges of land plots to optimize land use;

■ **Minimization:**

- Ensure full application of the LALRF, in line with national legislation and EBRD and IFC standards;
- Ensure that all compensations are paid before the start of construction activities;
- Ensure that the LALRF process is subject to a completion audit carried out by an external auditor;
- Implement a grievance mechanism specific for land acquisition and livelihood restoration issues. Ensure that all project affected people are informed about this channel to submit grievances. Ensure that the grievance mechanism is managed in line with indications of the LALRF and that appropriate budget and resources are assigned.

■ **Rehabilitation/Restoration:**

- Upon the completion of construction activities, fully reinstate rented land and ensure it is handed over in its original conditions, to the extent possible.

7.3.3.1.3 Residual impacts

Considering the application of the abovementioned mitigation measures, the negative impact on the land use and ownership component is depicted in the following tables and it is expected to be:

- For the WF area: **low**;
- For the OHL area: **low**.

Table 68: WF area - residual impact assessment matrix for the land use and ownership component during the construction phase

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---|------------------------|-------------------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| Change in land use and ownership (permanent land acquisition) | Duration: | Long | Medium-low | Long term | Medium | Medium-high | Low |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Project footprint | | | | | |
| | Intensity: | High | | | | | |
| Change in land use and ownership (temporary land rental) | Duration: | Medium | Medium-low | Short-mid-term | Low | Medium-high | Negligible |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Project footprint | | | | | |
| | Intensity: | Low | | | | | |
| Change in land use and ownership (servitude) | Duration: | Long | Medium-low | Short-term | Negligible | Medium-high | Negligible |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Project footprint | | | | | |
| | Intensity: | Low | | | | | |

Table 69: OHL area - residual impact assessment matrix for the land use and ownership component during the construction phase

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---|------------------------|-------------------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| Change in land use and ownership (permanent land acquisition) | Duration: | Long | Medium | Long term | High | Medium-high | Low |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Project footprint | | | | | |
| | Intensity: | High | | | | | |
| Change in land use and ownership (temporary land rental) | Duration: | Medium | Medium | Short-mid-term | Medium | Medium-high | Negligible |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Project footprint | | | | | |
| | Intensity: | Low | | | | | |
| Change in land use and ownership (servitude) | Duration: | Long | Medium | Short-term | Low | Medium-high | Negligible |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Project footprint | | | | | |
| | Intensity: | Low | | | | | |

7.3.3.1.4 Monitoring

The monitoring measure listed below will be performed for the construction phase for land use and ownership component:

- Ensure that the Land Acquisition and Livelihood Restoration process is monitored in line with the indications provided in the specific section of the LALRF.

7.3.3.2 Operation Phase

7.3.3.2.1 Impact Analysis

The following **project actions** will generate impact factors on the land use and ownership component during the operation phase:

- Operation and maintenance of the WF;
- Operation and maintenance of the OHL;
- Presence of deposit areas.

The potential impacts on land use and ownership deriving from the above actions are associated with the following **impact factor**:

- Change in land use and ownership.

During the operation phase, a servitude will have to be placed along the OHL right of way, as indicated in the previous section. The servitude may imply the restriction to use the land, such as building, planting trees, right of way for internal cabling system and maintenance etc. The indication of activities that can and cannot be performed within the right of way during the operation phase is provided in the LALRF. Compensation will be provided for land subject to servitude, based on the indications of the LALRF.

7.3.3.2.2 Mitigation measures

The mitigation measures listed below follow the mitigation hierarchy and will be implemented for the construction phase for land use and ownership component:

- **Avoidance:**
 - When selecting the siting of the OHL right of way, avoid to the extent possible locating it on farmed land or land with the presence of fruit trees or other assets;
- **Minimization:**
 - Ensure full application of the LALRF, in line with national legislation and EBRD and IFC standards;
 - Ensure that land users and owners are fully clear on the meaning of the servitude and fully clear of the restrictions applied throughout the servitude area;
 - Ensure that all compensations are paid before the start of construction activities;
 - Implement a grievance mechanism specific for land acquisition and livelihood restoration issues. Ensure that all project affected people are informed about this channel to submit grievances. Ensure that the grievance mechanism is managed in line with indications of the LALRF and that appropriate budget and resources are assigned.

7.3.3.2.3 Residual impacts

Considering the application of the abovementioned mitigation measures, the impact negative on the land use and ownership component is depicted in the following tables and it is expected to be:

- For the WF area: **negligible**;
- For the OHL area: **negligible**.

Table 70: WF area - residual impact assessment matrix for the land use and ownership component during the operation phase

| Impact Factor | Impact Factor Features | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|--|--------------------------------|-----------------------|---------------------------------|-------------------|--------------------------|-----------------------|
| Change in land use and ownership (servitude) | Duration: Long | Low | Short-term | Negligible | Medium-high | Negligible |
| | Frequency: Continuous | | | | | |
| | Geo. Extent: Project footprint | | | | | |

| | | | | | |
|--|----------------|--|--|--|--|
| | Intensity: Low | | | | |
|--|----------------|--|--|--|--|

Table 71: OHL area - residual impact assessment matrix for land use and ownership component during operation phase

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|--|------------------------|-------------------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| Change in land use and ownership (servitude) | Duration: | Long | Medium | Short-term | Low | Medium-high | Negligible |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Project footprint | | | | | |
| | Intensity: | Low | | | | | |

7.3.3.2.4 Monitoring

The monitoring measure listed below will be performed for the operation phase for land use and ownership component:

- Ensure that the Land Acquisition and Livelihood Restoration process is monitored in line with the indications provided in the specific section of the LALRF.

7.3.4 Community health, safety and security

7.3.4.1 Construction phase

7.3.4.1.1 Impact Analysis

The following **project actions** will generate impact factors on the community health, safety and security component during the construction phase:

- Mobilization of vehicles, workers and equipment, transport of materials and waste;
- Vegetation clearance;
- Surface levelling and grading;
- Blasting;
- Temporary stockpiling of material;
- Construction of the wind turbine foundations;
- Construction of the wind turbines;
- Construction of OHL pylon foundations;
- Construction of the OHL pylons;
- Construction of deposit areas.

The potential impacts on community health, safety and security deriving from the above actions are associated with the following **impact factors**:

- Emission of dust and particulate matter;
- Emission of gaseous pollutants;
- Emission of noise and vibrations;
- Increase of traffic;

- Influx of workers;

The construction of a the WF and of the OHL, like all large industrial and infrastructure construction projects, carries with it several key health and safety risks to the workers employed on the project as well as members of the surrounding communities. Key issues for consideration associated with the proposed project are as follows:

- Working at height and in confined spaces;
- Working with large scale structures;
- Ground excavation hazards;
- Potential for electrocution;
- Traffic;
- Issues associated unauthorised access and vandalism.

Potential impacts on workers' health and security can be managed through specific Management Plans, in order to reduce risks to the extent possible. Safety and security measures will have to be applied by al workers, both of Contractors and Subcontractors.

Impacts to surrounding communities will mainly have to do with risk of accidents with vehicles and people due to transport and traffic along the road. Specific mitigation measures will be implemented also in this case to reduce risks to the extent possible.

Potential impacts on communities' health due to the emission dust and particulate matter and of pollutants have been assessed in Section 7.1.6. Potential impacts due to the emission of noise and vibration have been assessed in Section 7.1.7.

The influx of workers in the Aol can lead to an increase of communicable diseases among the population. This value impact however is considered to be limited, considering that the number of workers will be limited and similarly the interactions between workers and local population will be limited. The presence of workers can also lead to tensions and conflicts with the local population, due to inappropriate behaviours and frictions. Once again interactions between workers and the local population will be limited during the construction phase, hence the potential impact is expected to be low and manageable through appropriate measures.

Finally, construction activities, particularly those related to transport, can lead to disruptions in roads and hence limit accessibility to health centres and hospitals for the local population. This potential impact will have to be properly managed in collaboration with local authorities, to ensure that impacts are reduced to the extent possible.

7.3.4.1.2 Mitigation measures

For the mitigation of impacts on the community health, safety and security component all measures indicated for the air quality, noise and vibration and transportation and traffic components have to be applied. In addition, the mitigation measures listed below will be implemented for the construction phase for the community health, safety and security component according to the mitigation hierarchy:

- **Minimization:**

- Prepare and implements a Workers' Health and Safety Management Plan, which must include induction and training for all contractors' and subcontractors' workers; workers' health and safety should be managed in line with national regulations, EBRD and IFC standards and OHSAS18001 standard;

- Enforce workers code of conduct;
- Cooperate and coordinate with local health and safety facilities to minimize impacts on health centres and access for the local population.

7.3.4.1.3 Residual impacts

Considering the application of the abovementioned mitigation measures, the impact on the community health, safety and security component is depicted in the following table and it is expected to be **negative** and **negligible** both for the WF and OHL area.

Table 72: WF and OHL area - residual impact assessment matrix for the community health, safety and security component during the construction phase

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---------------------|------------------------|-----------------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| Influx of workers | Duration: | Medium | Medium | Short-term | Low | Medium | Negligible |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Low | | | | | |
| Increase of traffic | Duration: | Medium | Medium | Short-term | Low | Medium | Negligible |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Beyond regional | | | | | |
| | Intensity: | High | | | | | |

7.3.4.1.4 Monitoring

The following monitoring activities will be performed to ensure the implementation and effectiveness of the proposed mitigation measures:

- Verification of the number of work-related incidents involving contractor workers, subcontractor workers and external persons;
- Verification of the number of traffic-related incidents involving contractor workers, subcontractor workers and external persons;
- Verification of the number of grievances received and percentage of grievances resolved positively.

7.3.4.2 Operation Phase

7.3.4.2.1 Impact Analysis

The following **project actions** will generate impact factors on the community health, safety and security component during the operation phase:

- Operation and maintenance of the WF;
- Operation and maintenance of the OHL;

The potential impacts on community health, safety and security deriving from the above actions are associated with the following **impact factors**:

- Emission of noise and vibrations;
- Generation of electromagnetic fields;
- Presence of new buildings/infrastructures.

For impacts related to the noise emissions generated by the Wind Turbine Generators please refer to the section on noise and vibrations.

With regards to the impact linked to the generation of electromagnetic fields, this will occur only along the OHL.

A specific study and report, provided as Appendix to this document, has been prepared by Abkons on this impact. The impacts that have been assessed from this report are here described.

There has been considerable research over the last 30 years associated with the potential impacts on human health associated with EMF. A detailed review and discussion of the scientific literature associated with this area of research is outside of the scope of this project, however, the IFC health and safety guidance for overhead power lines (IFC, 2007c) states the following in regard to the available scientific information:

Although there is public and scientific concern over the potential health effects associated with exposure to EMF (not only high voltage power lines and substations, but also from everyday household uses of electricity), there is no empirical data demonstrating adverse health effects from exposure to typical EMF levels from power transmissions lines and equipment. However, while the evidence of adverse health risks is weak, it is still sufficient to warrant limited concern.

Assuming the worst case scenario that there is a link between EMFs and impacts on human health, it is evident that EMFs have the highest intensity in close proximity to their source, with intensity declining in relation to distance from the source. Therefore, it is logical that only receptors that have long term close contact with high exposure rates to EMF may potentially be affected. Such a receptor can be categorized as residential situated in close proximity to a high voltage source.

The assessment includes checks of clearance distances from civil buildings, road intersections and all the safety distances that a 110 kV Overhead Transmission Line must ensure in the nearby area.

The scope of the assessment is also to verify that all the electrical and safety measures have been followed by the power line designer in order for the overhead transmission line to be safe and pose no health risks to local residents during operation.

Given the characteristics of the transmission line (110 kV OHL) and based on the literature and recent studies for similar cases the area of influence is determined to be up to 25 m from the current transmission line.

Meanwhile, no parameters of EMF limits have been found during research into the legislation of Kosovo for this study. For this reason, the same reference levels as in the EU have been applied and have been compared to similar norms in Albania (Albanian Technical Design Conditions KTPs).

Based on the vicinity of the OHL Project to residential homes, there are two receptors that have been identified, which may be of concern on public health: one in Bajgore near pylon 76 (T76) and two in Vushtrri area (between T10 and T12) where the voltage pylons and/or Line wires are near homes.

From the computer simulations, details presented in the study annexed to this report, the conclusion was that the calculated values for both electric and magnetic fields are far from the maximal allowable limits.

The turbines' operation generates a phenomenon called **shadow flicker** occurring when the blades of a wind turbine rotate in sunny conditions and cast moving shadows on the ground, alternating light intensity. As the rotor blades rotate, shadows pass over the same point causing an effect that may become a problem when potentially sensitive receptors are located nearby or have a specific orientation to the wind energy facility

Shadow flicker is limited in time and location. As per the World Bank Group (WBG) EHS Guideline on Wind Energy (August 2015), it is recommended that the predicted duration of shadow flicker effects experienced at a sensitive receptor don't exceed 30 hours per year and 30 minutes per day on the worst affected day, based on a worst-case scenario as described below. Based on the turbine specifications (blades dimensions), coordinates of the wind turbines and receptors location, a shadow flicker study has been conducted for the WF by UL DEWI company (**ANNEX G**).

The following parameters have been used for the calculation of the astronomically possible impact of shadow flicker:

- * Shadow range of the WTG according to 20%-coverage-criterion
- * Min. relevant solar angle of 3° (flat terrain)
- * calculation time steps : 1 day / 1 Minute

The calculations for Bajgora site show that shadow flicker impact only four of the 13 regarded receptors (shown in Figure 9). At Receptor Location RL7 (Bajgora 2) the recommended limit of 30 minutes per day is exceeded, at RL11 (Bajgora 7) both recommended limits are exceeded.

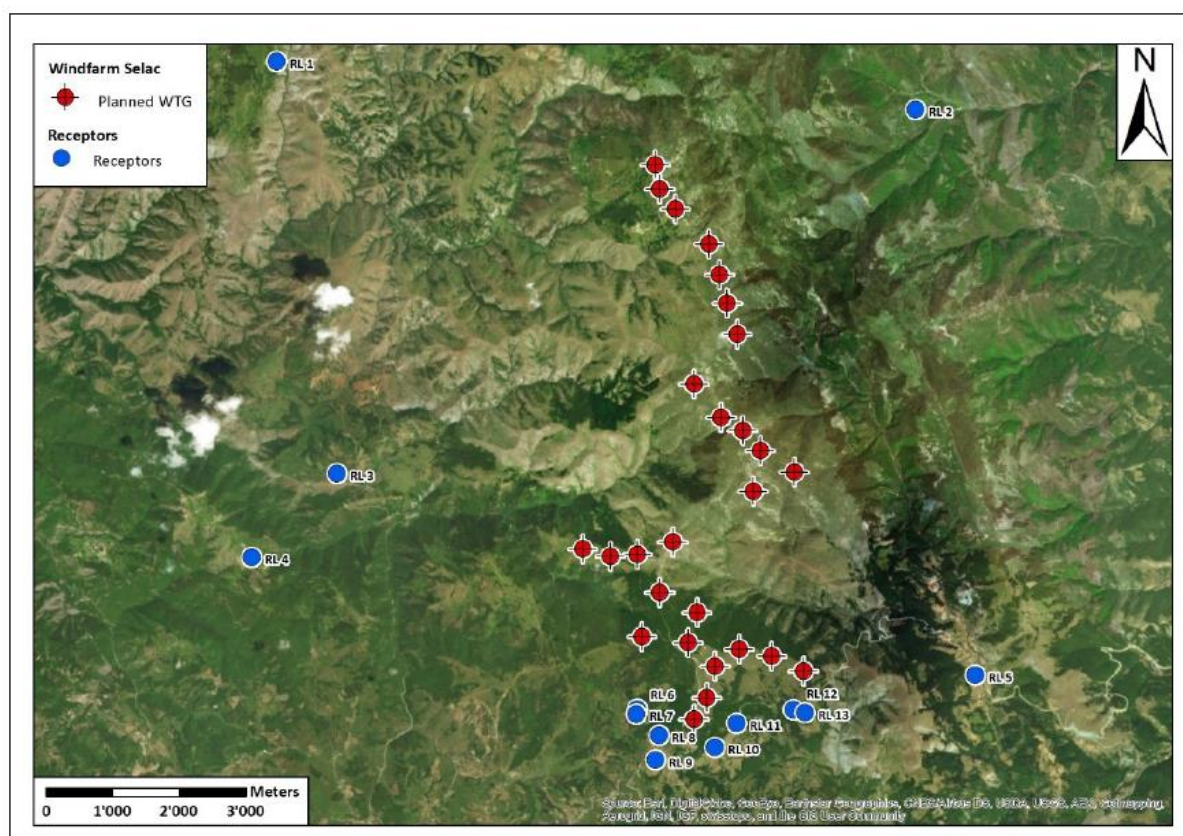


Figure 9: Receptors identified in the shadow flicker study

At the receptor RL 11 shadowing times of up to 54:46 hours per year are possible. According to weather statistics these values can be assumed to turn out much lower in reality: the meteorologically possible shadow flicker amounts 15:28 hours per year.

The astronomical possible maximum of time with shadow flicker impact per day amounts to 34 minutes at RL 7 and to 46 minutes at RL 11. This parameter is not mitigated reliably by weather statistics, because of the probability that adverse weather conditions (bright sunlight, wind direction parallel or close to the line of sight between WTG and receptor) might occur at the day with high astronomically possible shadow flicker.

A failure of the rotor blade can result in the “**throwing**” of a **rotor blade**, or part thereof, which may affect public safety. The overall risk of blade throw is considered extremely low as highlighted in the World Bank Group WBG EHS Guideline on Wind Energy (2015).

A possible hazard is the risk of **ice throw**. If ice accretion occurs on blades, which can happen in certain weather conditions in cold climates, then pieces of ice can be thrown from the rotor during operation or dropped from it if the turbine is idling.

Turbines must be sited at an acceptable distance ("setback") between wind turbines and adjacent sensitive receptors to maintain public safety in the event of ice throw or blade failure.

For blade throw risk management, WBG EHS Guideline on Wind Energy recommends establishing setback distances between turbines and populated locations. The minimum setback distance is 1.5 x turbine height (tower + rotor radius), although modelling suggests that the theoretical blade throw distance can vary with the size, shape, weight, and speed of the blades, and the height of the turbine. It is therefore recommended that the minimum setback distances required to meet noise and shadow flicker limits be maintained with respect to sensitive residential receptors to provide further protection.

For ice throw risk management, WBG EHS Guideline on Wind Energy recommends establishing setback distances as per International Energy Agency (IEA, 2017) guidance document.

The maximum ice throw distance for a rotating turbine is represented by the Seifert Formula (IEA, 2017), in flat terrain:

$$d = 1.5 \times (D + H)$$

d: Maximum throwing distance of ice (m)

D: Rotor diameter

H: Hub Height

Based on WT parameters of Bajgora Project, the set-back distance for blade and ice throw is calculated as follows:

$$d = 1.5 \times (137 \text{ m} + 110 \text{ m}) = 370.5 \text{ m}$$

Based on the distances between turbines and receptors locations listed in the following table (from the Noise Propagation Model, **ANNEX C**), no receptors are expected to be affected by the potential blade or ice throw.

| | IO1 | IO2 | IO3 | IO4 | IO5 | IO6 | IO7 | IO8 | IO9 | IO10 | IO11 | IO12 | IO13 |
|--------|-------|------|------|------|------|------|------|------|------|------|------|------|------|
| I-01 | 11810 | 9854 | 6539 | 7086 | 4290 | 863 | 867 | 574 | 842 | 528 | 651 | 1511 | 1683 |
| I-02 | 11642 | 9479 | 6524 | 7167 | 4055 | 1060 | 1091 | 915 | 1219 | 760 | 594 | 1319 | 1500 |
| I-03 | 11315 | 8985 | 6393 | 7156 | 3921 | 1338 | 1391 | 1342 | 1682 | 1231 | 928 | 1358 | 1535 |
| I-04 | 11328 | 8619 | 6616 | 7464 | 3570 | 1790 | 1844 | 1783 | 2107 | 1537 | 1129 | 1231 | 1387 |
| I-05 | 11714 | 8587 | 7101 | 7958 | 3080 | 2176 | 2220 | 2075 | 2353 | 1626 | 1146 | 880 | 1001 |
| I-06 | 12254 | 8764 | 7669 | 8499 | 2574 | 2564 | 2596 | 2366 | 2579 | 1732 | 1249 | 546 | 569 |
| I-07 | 10786 | 8795 | 5870 | 6684 | 4352 | 1271 | 1343 | 1475 | 1854 | 1643 | 1432 | 1891 | 2065 |
| I-08 | 10328 | 9004 | 5214 | 5990 | 5048 | 1111 | 1190 | 1522 | 1892 | 2009 | 1942 | 2538 | 2717 |
| I-09 | 10504 | 8323 | 5819 | 6753 | 4288 | 1725 | 1800 | 1949 | 2327 | 2062 | 1782 | 2068 | 2226 |
| II-10 | 9928 | 8286 | 5190 | 6167 | 4901 | 1809 | 1888 | 2167 | 2548 | 2489 | 2295 | 2682 | 2846 |
| II-11 | 9260 | 7958 | 4684 | 5798 | 5403 | 2349 | 2427 | 2760 | 3133 | 3148 | 2965 | 3328 | 3486 |
| II-12 | 9028 | 8182 | 4292 | 5389 | 5789 | 2382 | 2456 | 2835 | 3193 | 3319 | 3189 | 3627 | 3792 |
| II-13 | 8747 | 8367 | 3876 | 4976 | 6203 | 2550 | 2620 | 3032 | 3371 | 3591 | 3503 | 3992 | 4161 |
| III-14 | 9432 | 7517 | 5161 | 6339 | 4977 | 2602 | 2681 | 2945 | 3327 | 3183 | 2918 | 3130 | 3273 |
| III-15 | 9704 | 6293 | 6269 | 7610 | 4356 | 3749 | 3825 | 3972 | 4346 | 3936 | 3538 | 3379 | 3460 |
| II-16 | 9990 | 5807 | 6884 | 8266 | 4111 | 4312 | 4386 | 4487 | 4849 | 4348 | 3913 | 3610 | 3660 |
| II-17 | 9385 | 5684 | 6382 | 7823 | 4699 | 4350 | 4427 | 4588 | 4964 | 4562 | 4161 | 3971 | 4043 |
| II-18 | 8988 | 5530 | 6140 | 7633 | 5102 | 4524 | 4602 | 4797 | 5177 | 4830 | 4448 | 4310 | 4390 |
| II-19 | 8484 | 5531 | 5740 | 7283 | 5593 | 4640 | 4719 | 4955 | 5338 | 5070 | 4719 | 4658 | 4752 |
| II-20 | 7971 | 5336 | 5544 | 7158 | 6123 | 5022 | 5101 | 5366 | 5750 | 5533 | 5199 | 5175 | 5273 |
| III-21 | 8028 | 4316 | 6376 | 8050 | 6360 | 5944 | 6023 | 6256 | 6639 | 6341 | 5969 | 5830 | 5905 |
| III-22 | 7707 | 4088 | 6411 | 8123 | 6782 | 6323 | 6402 | 6648 | 7031 | 6755 | 6391 | 6265 | 6342 |
| III-23 | 7407 | 3873 | 6498 | 8242 | 7209 | 6726 | 6806 | 7063 | 7446 | 7188 | 6829 | 6713 | 6790 |
| III-24 | 7071 | 3723 | 6591 | 8362 | 7685 | 7156 | 7235 | 7504 | 7887 | 7651 | 7298 | 7195 | 7274 |
| III-25 | 6408 | 3914 | 6490 | 8288 | 8404 | 7632 | 7711 | 8006 | 8387 | 8207 | 7876 | 7821 | 7909 |
| III-26 | 6080 | 4038 | 6498 | 8304 | 8787 | 7917 | 7996 | 8302 | 8682 | 8527 | 8205 | 8170 | 8260 |
| III-27 | 5905 | 4012 | 6699 | 8506 | 9135 | 8282 | 8361 | 8670 | 9050 | 8900 | 8579 | 8544 | 8634 |

According to IFC Guidelines for Wind project (2015), strategies for the blade or ice throw will be applied during operations (see 7.3.4.2.2).

7.3.4.2.2 Mitigation measures

For the mitigation of impacts on the community health, safety and security component all measures indicated for the noise and vibration component have to be applied.

In addition, the mitigation measures listed below will be implemented relatively to the generation of electromagnetic fields for the operation phase for the community health, safety and security component according to the mitigation hierarchy:

■ Minimization:

- Dissemination of information in the areas nearby on risks related to OHL;
- Frequent controls to check the construction of buildings or illegal buildings near the area of risk (25 Meters);
- Frequent control to check if any animal shelter is being built in the same safety zone;
- Switching units to reduce the shadowing times to the recommended values. In case an automatic switching unit is used that takes into account meteorological inputs from radiation or illumination sensors, the actual real-time shadows should be limited to 8 hours per calendar year;
- Carrying out periodic blade inspections and repair any defects that could affect blade integrity;
- Installing lightning protection systems properly maintained;
- Equip wind turbines with vibration sensors that can react to any imbalance in the rotor blades and shut down the turbine if necessary;

- Curtail wind turbine operations in weather conditions that can lead to ice accretion.
- Equip turbines with ice detectors that shut down the turbine to an idling state when ice is present
- Installing a de-icing system, which is a hardware-based on a heater-blower thermal system that heats the leading edge of the blades during icing periods. The system is capable of heating all the blades simultaneously and whilst the blades are rotating.

7.3.4.2.3 Residual impacts

Considering the application of the abovementioned mitigation measures, the negative impact on the community health, safety and security component is depicted in the following tables and it is expected to be:

- For the OHL area: **low**.

Table 73: OHL area - residual impact assessment matrix for the community health, safety and security component during the operation phase

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---|------------------------|------------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| Generation of electromagnetic fields | Duration: | Long | Medium | Short-term | Low | Low | Low |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Low | | | | | |
| Presence of new buildings/infrastructures (shadow flicker effect) | Duration: | Long | Medium | Short-term | Negligible | High | Negligible |
| | Frequency: | Sporadic | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Negligible | | | | | |
| Presence of new buildings/infrastructures (blade throw and ice throw) | Duration: | Long | Medium | Short-term | Negligible | High | Negligible |
| | Frequency: | Sporadic | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Negligible | | | | | |

7.3.4.2.4 Monitoring

The following monitoring activities are foreseen to ensure the implementation and effectiveness of the proposed mitigation measures:

- Verification of the number of grievances received and percentage of grievances resolved positively.

7.3.5 Transportation and traffic

7.3.5.1 Construction phase

7.3.5.1.1 Impact Analysis

The following **project actions** will generate impact factors on the transportation and traffic component during the construction phase:

- Mobilization of vehicles, workers and equipment, transport of materials and waste;
- Surface levelling and grading;
- Construction of the wind turbine foundations;
- Construction of the wind turbines;
- Construction of OHL pylon foundations;

- Construction of OHL pylons;
- Construction of deposit areas;
- Waste management.

The potential impacts on transportation and traffic deriving from the above actions are associated with the following **impact factors**:

- Increase of traffic;
- Interruption/limitation of infrastructures/services.

The components of the WF and OHL will be transported from port of Durres (Albania) by trucks through Albania-Kosovo Highway then directed toward Pristina-Mitrovica National Road and lastly from Mitrovica to Bajgora village through local road.

The Albania-Kosovo highway is not considered to be sensitive receptor as other roads since it is a highway and with careful planning there will be little or no delays on traffic and other transportations.

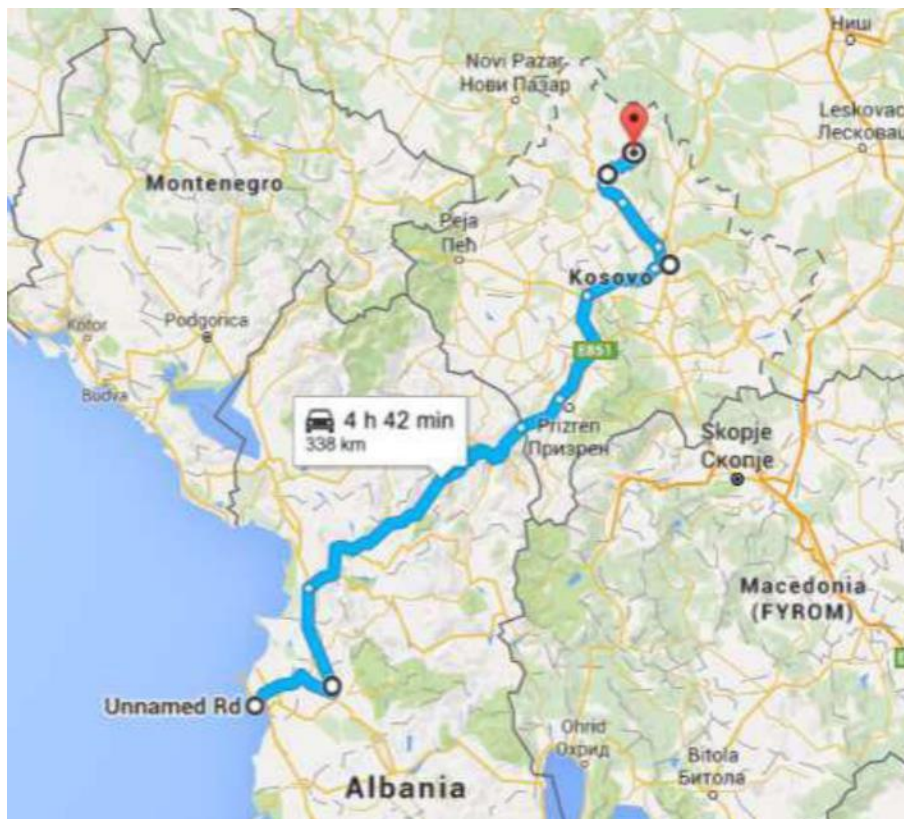


Figure 10: Transport route from Durres (port) Albania-Bajgora (site) Mitrovica, Kosovo

The Pristina-Mitrovica road is partially being constructed and partially already finished in 2016, it is one of the busiest roads of Kosovo where also heavy truck transportation takes place but until now no infrastructure problems were encountered. As the road is being rebuilt it can be concluded that is a good quality infrastructure and should be strong enough for the heavy trucks that will be used to deliver components needed for the construction of the wind farm.

The route from Mitrovica to the Site entrances (approx. 18 km long) is used very rarely only by inhabitants, overall quality is good and is expected in most sections to meet the heavy transportation standards. However,

the road presents some critical points that will have to be enlarged for the passage of special self-propelled trailers, which will be used for very long blades and tower adaptors. Due to big length of the blades, on most of the curves of the road there will be the need to remove traffic signs, traffic lights and protective barriers or fences. Closer to the site, the curves will need to be expanded as well as additional geodetic measurements and swept path analyses will have to be made.

It is possible that during the transport of special elements such as blades, roads will have to be temporarily closed, causing disruptions in local traffic and difficulties in moving along the road and accessing villages or individual houses. The villages affected however are relatively small and traffic volumes are really low. In any case these situations will have to be carefully managed to reduce disruptions as much as possible.

In addition, the construction of new roads or track roads for the transport of the OHL pylons will be required in areas where local or secondary roads cannot reach the point of installation. These roads will generally have a limited length; in some cases their impact may be considered positive, as they will allow reaching areas currently inaccessible.



Figure 11: Different views from the local roads which provide access to different parts of the project area

Impacts will also be generated due to the need to transport materials (e.g. concrete for the foundations) and workers to and from the sites. However, these traffic flows will be limited and will not have significant impacts.

At the end of construction activities, enforcements and improvements of existing roads will actually leave a positive legacy on the local road conditions, resulting in benefits for the local communities.

7.3.5.1.2 Mitigation measures

The mitigation measures listed below follow the mitigation hierarchy and will be implemented for the construction phase for the transportation and traffic component:

■ Avoidance:

- When selecting the routes to be used for the transport of materials and products, identify roads that are likely to cause the lowest impacts to local communities, terms of disruption of access and disturbance to population;
- Plan transportation routes in consultation with Municipality, road department and Police;
- Avoid transport activities, particularly those involving heavy goods vehicles, during peak hours;

■ Minimization:

- Ensure that local communities are timely informed about road closures, works on roads or use of heavy good vehicles;
- Develop and implement a Traffic Management Plan (TMP);
- Ensure that all Contractors and Subcontractors follow the TMP;
- Ensure that all drivers (both of Contractors and Subcontractors) receive induction and training on road safety rules.

■ Rehabilitation/Restoration:

- Ensure that possible damages to existing roads are repaired promptly and that at the end of construction activities roads are left in original or better conditions.

7.3.5.1.3 Residual impacts

Considering the application of the abovementioned mitigation measures, the impact on transportation and traffic component is depicted in the following table and it is expected to be **negative** and **negligible** both for the WF and OHL area.

Table 74: WF and OHL area - residual impact assessment matrix for the transportation and traffic component during the construction phase

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---|------------------------|-----------------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| Increase of traffic | Duration: | Medium | Medium-high | Short-term | Low | Medium | Low |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Beyond regional | | | | | |
| | Intensity: | High | | | | | |
| Interruption/limitation of infrastructures/services | Duration: | Medium | Medium-high | Short-term | Low | Medium | Negligible |
| | Frequency: | Sporadic | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Medium | | | | | |

7.3.5.1.4 Monitoring

The following monitoring activities will be performed to ensure the implementation and effectiveness of the proposed mitigation measures:

- Verification of the number of traffic-related incidents involving contractor workers, subcontractor workers and external persons;
- Verification of the number of full road closures caused by Project activities;
- Verification of the number of grievances received and percentage of grievances resolved positively.

7.3.5.2 Operation Phase

7.3.5.2.1 Impact Analysis

No project actions will generate impact factors on the transportation and traffic component during the operation phase, therefore the impact assessment is not performed in this phase. Limited traffic will be generated in this phase during periodic maintenance activities that will be conducted on the WF and OHL. Improvements to the roads performed during the construction phase can be considered a positive legacy on the local road conditions, resulting in benefits for the local communities.

7.3.6 Housing and Infrastructures

7.3.6.1 Construction phase

7.3.6.1.1 Impact Analysis

The following **project actions** will generate impact factors on the infrastructures component during the construction phase:

- Mobilization of vehicles, personnel and equipment, transport of dismantled material;
- Surface levelling and grading;
- Construction of the wind turbine foundations;
- Construction of the wind turbines;
- Construction of OHL pylon foundations;
- Construction of OHL pylons;
- Construction of deposit areas;
- Waste management.

The potential impacts on housing and infrastructures deriving from the above actions are associated with the following **impact factors**:

- Demand for waste disposal services;
- Interruption/limitation of infrastructures/services.

The Project will not directly impact houses within the AoI both of the WF and of the OHL, as no displacement of people or buildings is necessary. Construction activities will generate limited impacts on infrastructures and access to services. Impacts will potentially occur on roads and traffic, as indicated in section 7.3.5. Construction activities are unlikely to have impacts on water distribution networks, considering that their extent is limited in the AoI and on water sources, considering that water will not be supplied locally, and limited excavations will be performed that may have impacts on groundwater or surface water used by local communities, as indicated in

the hydrology component. Likewise, the Project is not expected to have impacts on the local energy distribution system, as no activities will be directly performed on this network.

Construction activities will generate waste that will have to be properly disposed of. To date the typology and amount of waste produced is not known. Once it is known, the Proponent will have to identify suitable waste disposal facilities that are able to receive the typologies and amounts of waste produced.

7.3.6.1.2 Mitigation measures

The mitigation measures listed below follow the mitigation hierarchy and will be implemented for the construction phase for the housing and infrastructures component:

■ Avoidance:

- When selecting the siting of project elements, construction sites and access roads, avoid to the extent possible creating interferences with existing infrastructures;
- Apply best practices for the reduction of waste produced to the extent possible.

■ Minimization:

- Ensure that local communities are timely informed about road closures, works on roads or use of heavy good vehicles;
- Ensure that local communities are timely informed about any disruptions on infrastructures (water distribution, energy distribution) that might be caused by construction activities;
- Ensure that waste is recovered and recycled to the extent possible, so to reduce the need of sending it to landfills;
- Identify and use waste disposal facilities as close as possible to the Project location, so to reduce the need of transport.

■ Rehabilitation/Restoration:

- Ensure that possible damages to existing infrastructures are repaired promptly and that at the end of construction activities roads are left in original or better conditions.

7.3.6.1.3 Residual impacts

Considering the application of the abovementioned mitigation measures, the impact on the housing and infrastructures component is depicted in the following table and it is expected to be **negative** and **low** both for the WF and OHL area.

Table 75: WF and OHL area - residual impact assessment matrix for the housing and infrastructures component during the construction phase

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---|------------------------|---------------------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| Demand for waste disposal services | Duration: | Medium | Medium | Short-mid-term | Low | Medium | Low |
| | Frequency: | Moderately frequent | | | | | |
| | Geo. Extent: | Regional | | | | | |
| | Intensity: | Low | | | | | |
| Interruption/limitation of infrastructures/services | Duration: | Medium | Medium | Short-term | Negligible | Medium | Negligible |
| | Frequency: | Sporadic | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Low | | | | | |

7.3.6.1.4 Monitoring

The following monitoring activities will be performed to ensure the implementation and effectiveness of the proposed mitigation measures:

- Verification of the number of disruptions to local infrastructures caused by Project activities;
- Verification of the number of grievances received and percentage of grievances resolved positively.

7.3.6.2 Operation Phase

7.3.6.2.1 Impact Analysis

The following **project actions** will generate impact factors on the infrastructures component during the operation phase:

- Operation and maintenance of the WF;

The potential impacts on infrastructures deriving from the above actions are associated with the following **impact factors**:

- Demand for waste disposal services;
- Production of energy.

During this phase, the production of energy will lead to general benefits on Kosovo's energy market, increasing the amount of energy available to businesses, industries and families, and decreasing the dependence on fossil sources. Works on the OHL and the substation will introduce new infrastructures and will overall improve the power transmission network. This may have effects also at the local level, improving the overall quality of the energy distribution system.

During operation activities, limited amounts of waste will be produced and will have to be disposed. These will mainly derive from the periodic maintenance activities that will be performed on the WF and on the OHL. To date it the typology and amount of waste produced is not known. Once it is known, the Proponent will have to identify suitable waste disposal facilities that are able to receive the typologies and amounts of waste produced.

7.3.6.2.2 Mitigation measures

The mitigation measures listed below follow the mitigation hierarchy and will be implemented for the operation phase for the housing and infrastructures component:

- **Avoidance:**

- Apply best practices for the reduction of waste produced to the extent possible.

- **Minimization:**

- Ensure that local communities are timely informed about road closures, works on roads or use of heavy good vehicles necessary for periodic maintenance activities;
 - Ensure that local communities are timely informed about any disruptions on infrastructures (water distribution, energy distribution) that might be caused by periodic maintenance activities;
 - Ensure that waste is recovered and recycled to the extent possible, so to reduce the need of sending it to landfills;
 - Identify and use waste disposal facilities as close as possible to the Project location, so to reduce the need of transport.

7.3.6.2.3 Residual impacts

Considering the application of the abovementioned mitigation measures, the impact on the housing and infrastructures component is depicted in the following table and it is expected to be **negative** and **low** both for the WF and OHL area.

Table 76: WF and OHL area - residual impact assessment matrix for the housing and infrastructures component during the operation phase

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|------------------------------------|------------------------|------------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| Demand for waste disposal services | Duration: | Long | Medium | Short-mid-term | Low | Medium | Low |
| | Frequency: | Sporadic | | | | | |
| | Geo. Extent: | Regional | | | | | |
| | Intensity: | Negligible | | | | | |

7.3.6.2.4 Monitoring

The following monitoring activities will be performed to ensure the implementation and effectiveness of the proposed mitigation measures:

- Verification of the number of disruptions to local infrastructures caused by Project activities;
- Verification of the number of grievances received and percentage of grievances resolved positively.

7.3.7 Ecosystem services

7.3.7.1 Construction phase

7.3.7.1.1 Impact Analysis

The following **project actions** will generate impact factors on the ecosystem services component during the construction phase:

- Surface levelling and grading;
- Blasting;
- Construction of the wind turbine foundations;
- Construction of OHL pylon foundations;
- Construction of deposit areas;
- Environmental reinstatement of the construction areas.

The potential impacts on ecosystem services deriving from the above actions are associated with the following **impact factors**:

- Removal/degradation of soil and vegetation
- According to the outcomes of the Baseline Study, ecosystem services that communities within the Aol rely on is wood collected from the nearby forests, which is used for the heating of homes and for cooking, water from springs and superficial water bodies and land for animal pasture.
- Wood collection is relevant for the livelihood of families, as it represents the sole source of heating and cooking for all respondents. Project activities will reduce forested area due to the presence of Wind Turbine Generators and OHL pylons, hence reducing over time the availability of wood for local communities. The overall extension of forested areas removed due to project activities are however limited, hence the potential impact on peoples' livelihood should be limited.

- The creation of roads and track necessary for the construction of pylons can increase accessibility to forests that are currently not used. In addition, at the end of construction activities, some areas will be rehabilitated and will possibly return to be forests, allowing once again the collection of wood in the future.
- The cutting of wood for heating and cooking purposes can have further effects on habitats.
- With regards to water use, as described in the baseline section, the number of households within the Aol connected to the municipal system is limited (<40% of households in the Aol) and most families use water coming either from springs or from superficial water bodies. As assessed in chapter 7.1.4, impacts on hydrology and surface water during the construction phase are expected to be low for the WF area and negligible for the OHL. No impacts are therefore expected on the sources of water used by households, both in terms of quantity of water available and quality of the water.
- With regards to land used for pasture, as assessed in section 7.3.3 and as indicated in the LALRF, loss of pastureland due to project needs will be compensated both to land owners and to land users.
- No major impacts are expected on other ecosystem services.

7.3.7.1.2 Mitigation measures

Mitigation measures indicated for the hydrology and surface water component in section 7.1.4 and mitigation measures indicated for the land use and ownership component section 7.3.3 have to be implemented also to the ecosystem services component.

In addition, the mitigation measures listed below follow the mitigation hierarchy and will be implemented for the construction phase for the ecosystem services component:

- **Avoidance:**
 - When selecting the siting of project elements, construction sites and access roads, avoid to the extent possible locating them on forested land;
 - Minimize the amount of land occupied during construction;
- **Minimization:**
 - Consider the possibility of distributing among local communities the wood that will derive from vegetation removal activities during the construction phase;
- **Rehabilitation/Restoration:**
 - Upon the completion of construction activities, fully reinstate land that was previously forested, so that it can be used for wood collection once again in the future.

7.3.7.1.3 Residual impacts

Considering the application of the abovementioned mitigation measures, the impact on the ecosystem services component is depicted in the following table and it is expected to be:

- For the WF area: **medium**;
- For the OHL area: **medium**.

Table 77: WF area - residual impact assessment matrix for the ecosystem services component during the construction phase

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---|------------------------|---------------------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| Changes in the local hydrology | Duration: | Medium | Medium-high | Mid term | Medium | Medium-high | Low |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Medium | | | | | |
| Demand for freshwater | Duration: | Medium | Medium-high | Short-term | Low | Medium-high | Negligible |
| | Frequency: | Moderately frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Low | | | | | |
| Change in land use and ownership (permanent land acquisition) | Duration: | Long | Low | Long term | Low | Medium-high | Negligible |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Project footprint | | | | | |
| | Intensity: | High | | | | | |
| Change in land use and ownership (temporary land rental) | Duration: | Medium | Low | Short-mid-term | Negligible | Medium-high | Negligible |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Project footprint | | | | | |
| | Intensity: | Low | | | | | |
| Change in land use and ownership (servitude) | Duration: | Long | Low | Short-term | Negligible | Medium-high | Negligible |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Project footprint | | | | | |
| | Intensity: | Low | | | | | |
| Removal/degradation of soil and vegetation | Duration: | Medium | Medium | Long term | Medium | Low | Medium |
| | Frequency: | Moderately frequent | | | | | |
| | Geo. Extent: | Project footprint | | | | | |
| | Intensity: | Medium | | | | | |

Table 78: OHL area - residual impact assessment matrix for the ecosystem services component during the construction phase

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---|------------------------|---------------------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| Changes in the local hydrology | Duration: | Medium | Medium | Short-term | Negligible | Medium-high | Negligible |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Negligible | | | | | |
| Demand for freshwater | Duration: | Medium | Medium | Short-term | Negligible | Medium-high | Negligible |
| | Frequency: | Moderately frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Negligible | | | | | |
| Change in land use and ownership (permanent land acquisition) | Duration: | Long | Medium | Long term | High | Medium-high | Low |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Project footprint | | | | | |
| | Intensity: | High | | | | | |
| Change in land use and ownership (temporary land rental) | Duration: | Medium | Medium | Short-mid-term | Low | Medium-high | Negligible |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Project footprint | | | | | |
| | Intensity: | Low | | | | | |
| Change in land use and ownership (servitude) | Duration: | Long | Low | Short-mid-term | Negligible | Medium-high | Negligible |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Project footprint | | | | | |
| | Intensity: | Medium | | | | | |
| Removal/degradation of soil and vegetation | Duration: | Medium | Medium | Long term | Medium | Low | Medium |
| | Frequency: | Moderately frequent | | | | | |
| | Geo. Extent: | Project footprint | | | | | |
| | Intensity: | Medium | | | | | |

7.3.7.1.4 Monitoring

The following monitoring activity will be performed to ensure the implementation and effectiveness of the proposed mitigation measures:

- Verification of the number of grievances received and percentage of grievances resolved positively.

7.3.7.2 Operation Phase

7.3.7.2.1 Impact Analysis

The following **project action** will generate impact factors on the ecosystem services component during the construction phase:

- Operation and maintenance of the OHL.

The potential impacts on ecosystem services deriving from the above actions are associated with the following **impact factor**:

- Removal/degradation of soil and vegetation.

Within the OHL Right of Way growth of trees and forests will have to be restricted for security reasons. Because of this, the forested area will be limited also in this phase, and this will lead to impacts on the availability of wood for heating and cooking purposes.

7.3.7.2.2 Mitigation measures

The mitigation measures listed below follow the mitigation hierarchy and will be implemented for the construction phase for the ecosystem services component:

■ Minimization:

- Consider the possibility of distributing among local communities the wood that will derive from vegetation removal activities during the construction phase;

7.3.7.2.3 Residual impacts

Considering the application of the abovementioned mitigation measures, the impact on the ecosystem services component is depicted in the following table and it is expected to be **negative** and **medium** both for the WF and OHL area.

Table 79: WF and OHL area - residual impact assessment matrix for the ecosystem services component during the operation phase

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|--|------------------------|---------------------|-----------------------|---------------------------------|--------------|--------------------------|-----------------------|
| Removal/degradation of soil and vegetation | Duration: | Long | Medium | Long term | Medium | Low | Medium |
| | Frequency: | Moderately frequent | | | | | |
| | Geo. Extent: | Project footprint | | | | | |
| | Intensity: | Low | | | | | |

7.3.7.2.4 Monitoring

The following monitoring activity is foreseen to ensure the implementation and effectiveness of the proposed mitigation measures:

- Verification of the number of grievances received and percentage of grievances resolved positively.

7.3.8 Cultural heritage and archaeology

7.3.8.1 Construction phase

7.3.8.1.1 Impact Analysis

The following **project actions** will generate impact factors on the cultural heritage and archaeology component during the construction phase:

- Surface levelling and grading;
- Blasting.

The potential impacts on cultural heritage and archaeology deriving from the above actions are associated with the following **impact factor**:

- Damage and destruction of cultural resources.

According to the outcomes of the baseline study, no sites of cultural value have been identified to be present within the Project footprint and its immediate surroundings. Therefore, no direct impacts are expected to be generated on known cultural sites. Likewise, according to the Archaeological Institute of Kosovo contacted, there is no pre-identified cultural resource/archaeological site of national or international interest within the Aol.

During excavation works while building foundation for wind turbines or other components there might be encountering of archaeological heritage objects; based on the outcomes of the baseline study, the probability of such findings is limited. If findings during construction activities occur, a Chance Find Procedure will be applied, to ensure that damages to findings are as limited as possible.

7.3.8.1.2 Mitigation measures

The mitigation measure listed below follows the mitigation hierarchy and will be implemented for the construction phase for the cultural heritage and archaeology component:

■ Minimization:

- Prepare a Chance Find Procedure that will have to be implemented anytime a finding of cultural or archaeological elements occurs due to Project activities; the Chance Find Procedure should involve authorities responsible for archaeological and cultural protection of Kosovo.

7.3.8.1.3 Residual impacts

Considering the application of the abovementioned enhancement measures, the impact on the cultural heritage and archaeology component is depicted in the following table and it is expected to be **negative** and of **negligible** both for the WF and OHL area.

Table 80: WF and OHL area - residual impact assessment matrix for the cultural heritage and archaeology component during construction phase

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|--|------------------------|-------------------|-----------------------|---------------------------------|-------------------|--------------------------|-----------------------|
| Damage and destruction of cultural resources | Duration: | Medium-short | Low | Irreversible | Negligible | Medium | Negligible |
| | Frequency: | Sporadic | | | | | |
| | Geo. Extent: | Project footprint | | | | | |
| | Intensity: | Low | | | | | |

7.3.8.1.4 Monitoring

The following monitoring activity will be performed to ensure the implementation and effectiveness of the proposed mitigation measures:

- Verification of the number of chance findings occurred during the construction phase.

7.3.8.2 Operation Phase

7.3.8.2.1 Impact Analysis

No project actions will generate impact factors on the cultural heritage and archaeology component during the operation phase, therefore the impact assessment is not performed in this phase.

7.3.9 Landscape and visual quality

7.3.9.1 Construction phase

7.3.9.1.1 Impact Analysis

The following **project actions** will generate impact factors on the landscape and visual quality component during the construction phase:

- Vegetation clearance;
- Surface levelling and grading;
- Construction of the wind turbines foundations;
- Construction of the wind turbines;
- Construction of the OHL pylons foundations;
- Construction of the OHL pylons;

- Construction of deposit areas;
- Environmental reinstatement of the construction areas.

The potential impacts on landscape and visual quality deriving from the above actions are associated with the following **impact factors**:

- Landscape features alteration;
- Presence of new buildings/infrastructures.

A specific Visual Impact Assessment report has been prepared for the Project (ANNEX E); please refer to this document provided in appendix for the results of the impact assessment.

7.3.9.2 **Operation Phase**

7.3.9.2.1 **Impact Analysis**

The following **project actions** will generate impact factors on the landscape and visual quality component during the operation phase:

- Operation and maintenance of the WF;
- Operation and maintenance of the OHL;
- Presence of deposit areas.

The potential impacts on landscape and visual quality deriving from the above actions are associated with the following **impact factors**:

- Landscape features alteration;
- Presence of new buildings/infrastructures.

A specific Visual Impact Assessment report has been prepared for the Project (ANNEX E); please refer to this document provided in appendix for the results of the impact assessment.

Impacts on the landscape caused by a Project are generally of two types: visual obstruction and visual intrusion. Visual obstruction occurs when new element constitutes a total or partial barrier to the perception of elements and landscapes behind. In the specific case of a power line or of a wind farm, this can occur in a very limited way.

Visual intrusion, on the other hand, occurs when new element causes a visual disturbance due to its aesthetic perceptive characteristics, regardless of the size of the field of vision it occupies. In the case in question, as the Project is configured, the impact will mainly concern the second aspect. Due to their shape, both in the case of the OHL and WF the main impact generated is due to the visual intrusion of the pylons and towers rather than the visual obstruction. Pylons and towers have a slender shape, hence the creation of a barrier effect is limited. In addition, it should be considered that WTGs add to the landscape a dynamic element due to the movement of the rotor, which is something atypical, considering that most elements in a landscape are static.

Based on these considerations, the impact of the Project has been performed on three main components considered to significant for the landscape of the Aol: the landscape types, the hydrographic network and the on the visual and perceptual characteristics of the landscape. With regards to the landscape types, the impact of the OHL has been identified to be medium, while the impact of the WF has been identified to be medium-high. With regards to the hydrographic network, the impact has been identified to be low, as limited interferences will occur between the Project elements and the rivers and water bodies present in the Aol. Finally, with regards

to the visual and perceptual characteristics of the landscape, various levels of impact have been identified according to the OHL sections and the WTGs considered; impacts vary from low to medium high.

7.4 Project Vulnerability to Natural Calamities and Incidents

7.4.1 Vulnerability to calamities

The following table summarizes potential negative impacts that can derive from the project's vulnerability to calamities.

The table lists natural, meteorological or geophysical calamities that can occur in the territory of Kosovo according to the document *"Mapping the impacts of natural hazards and technological accidents in Europe"* prepared in 2010 by the European Environmental Agency. Based on these calamities, the possible effects that can occur on the present project have been listed; a degree of risk is defined and synthesizes the magnitude of damage that can be caused by related incidents. The potential components that can be impacted are listed in the last column.

Table 81: Summary of risks that can derive from calamities

| Calamity | | Effects | | | | | | Degree of risk | | | | Components impacted |
|----------------|-----------------------|---------------------------|------------|----------------|---------------------|--|--|----------------|-----|--------|------|---|
| | | Safety threats to workers | Explosions | Internal fires | Structural collapse | Emission of pollutants in the atmosphere | Emission of pollutants in soil and water | Negligible | Low | Medium | High | |
| Meteorological | Flooding | X | | | X | | - | X | | | | Soil and land use Hydrology and surface water Community health, safety and security |
| | Wildfire | X | X | X | X | X | X | | X | | | Soil and land use Hydrology and surface water Community health, safety and security |
| | Drought | | - | - | - | | - | - | - | - | - | - |
| | Rapid weather changes | X | | | | | | | X | | | Community health, safety and security |
| | Storms and lightnings | X | | | | | | | X | | | Community health, safety and security |

| Calamity | | Effects | | | | | | Degree of risk | | | | Components impacted |
|-------------|----------------|---------------------------|------------|----------------|---------------------|--|--|----------------|-----|--------|------|---|
| | | Safety threats to workers | Explosions | Internal fires | Structural collapse | Emission of pollutants in the atmosphere | Emission of pollutants in soil and water | Negligible | Low | Medium | High | |
| Geophysical | Snow avalanche | | - | - | X | X | X | X | - | - | - | Soil and land use Hydrology and surface water Community health, safety and security |
| | Earthquake | | X | X | X | X | X | | X | | | Soil and land use Hydrology and surface water Community health, safety and security |
| | Landslide | | | | X | X | X | X | | | | Soil and land use Hydrology and surface water Community health, safety and security |
| | Volcanoes | | - | - | - | | - | - | - | - | - | - |

A brief description of main risks and impacts expected due to calamities is presented below.

Flooding: risks due to flooding are limited and involve only the Sitnica plain area. The possibility of flooding can be predicted in advance, therefore both during construction and during operation, measures will be adopted to ensure safety of workers if a flooding is expected. With regards to risks to Project elements, pylons T-4 to T-12 are located in flood prone area. Pylons have been structurally designed to withstand effects of flooding, therefore no specific risks are expected.

Wildfires: wildfires can occur due to the presence of forested and shrub areas. Wildfires are more likely to occur in summer, when there are high temperatures and dry conditions, and in periods with extended lack of rain. During the construction phase wildfires could have effects on workers present in the construction site. The Emergency Response Plan will include measures to be implemented to transfer workers to safe places in case of fires and to avoid safety risks. During the operation phase workers will be on the field occasionally, therefore safety risks in case of wildfires will be limited. With regards to risks for Project elements, if wildfires occur in forests and woods along the OHL, effects on the transmission of power could occur. However pylons have been structurally designed so to withstand possible damages due to fires. Wildfires are less likely in the WF area, as

the areas occupied by forests is more limited. WTGs have been designed to withstand effects of fires on the structures, therefore no risks are expected.

Droughts: considered to the type of Project and the fact that limited water is necessary during the construction phase and no water is necessary during the operation phase, no risks are expected in case of droughts.

Rapid weather changes, storms and lightnings: in high mountain areas rapid weather changes are possible and can include sudden drop in temperatures, increase of wind, presence of fog, presence of thunderstorms. These hazards can have effect particularly on workers working at higher altitudes or in remote locations during the construction phase. The Emergency Response Plan will include measures to be implemented to transfer workers to safe places in case of unfavourable weather conditions and to avoid safety risks. During the operation phase workers will be on the field occasionally, however specific measures will be adopted particularly for workers performing maintenance activities on pylons and WTGs.

Snow related natural hazards: these hazards such as avalanches, may be relevant in mountain areas; in the Wind Farm area they represent one of the main natural hazards. This kind of hazards mainly affect the workers' safety and the accessibility of the area.

Avalanches are events that occur when a coherent mass of snow is detached in correspondence to a base layer and slides down a slope. They may be triggered by an increase of load on the snowpack because of meteoric events or by a progressive weakening of the snowpack because of its transformation. An avalanche may also be triggered by an increase of load on the snowpack induced by human or animal activity or by seismic events.

The following three main conditions are necessary for the occurrence of an avalanche:

- a snowpack with cohesion among snow crystals;
- a weak layer or a favorable slide plan at the base or inside the snowpack;
- a slope characterized by an inclination greater than 25°.

In the Wind Farm area, wind turbines are located in correspondence to the top of the mountain ridge, where avalanche hazard is negligible. Nevertheless, access roads in some cases run along mountain slopes. Figure 12 shows the distribution of topographic surface areas with inclination greater than 25°, red dashed lines highlight areas where slopes with inclination greater than 25° stand above access roads. Compared to the total extension of access roads, few areas are potentially affected by avalanches; the most extend one is represented by the existing road bypassing wind turbines II-15, II-16, II-17 and II-18. Along this road section the maximum elevation of the slope portion with inclination greater than 25° is about 70 m; in case of heavy snowfall, in this area avalanche hazard may be not negligible.

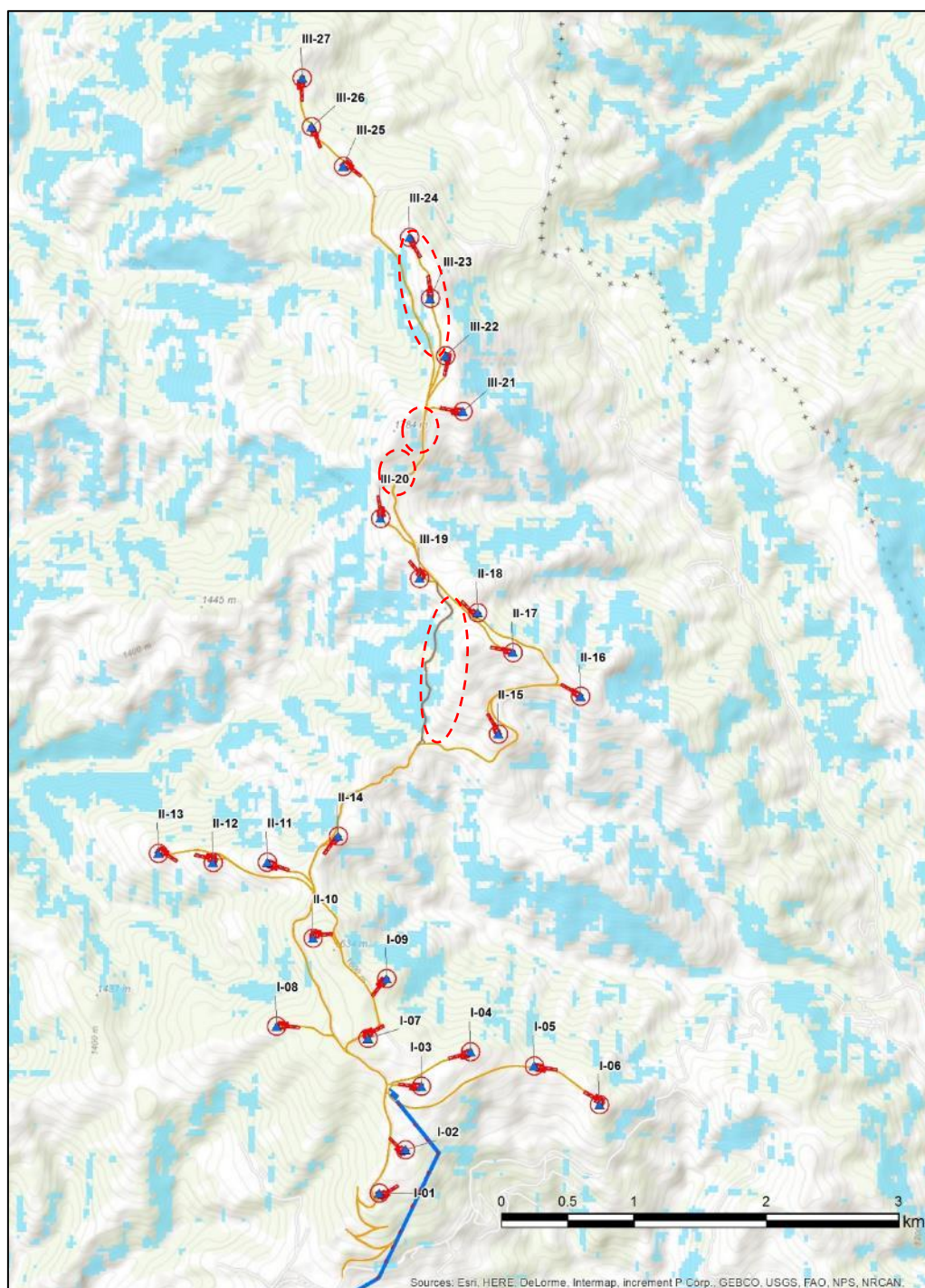


Figure 12: Blue areas: slope with inclination greater than 25°. Red dashed lines: areas where slope with inclination greater than 25° stand above access roads

With regard to Wind Farm area accessibility, the following measures shall be adopted during construction and operation phases:

- in case of light snowfall access roads cleaning will be performed by a vehicle owned by the SOWI Kosovo and based in Bajgora;
- in case of heavy snowfall an external company will be hired to clean the access roads;

- in case of emergency at least two snowmobile vehicles, owned by the SOWI Kosovo and based in Bajgora, may be used to access the site. These vehicles shall be equipped with frost resistant GPS and operated by trained personnel;
- in presence of snow only main access road and wind turbine access roads shall be used. Access to the existing roads bypassing wind turbines I-09 and II-10 and wind turbines II-15, II-16, II-17 and II-18 shall be interdicted. Beside the above-mentioned road sections, access to all wind turbines shall be continuously provided during winter season;
- in mountain areas wind may move and deposit light snow, leading to the formation of snowdrifts and potentially unstable snow accumulations. If weather conditions are windy road accessibility and the presence of potentially unstable snowdrifts shall be verified before accessing to Wind Farm area.

The outline of access roads in Wind Farm area in case of snow is reported in Figure 13.

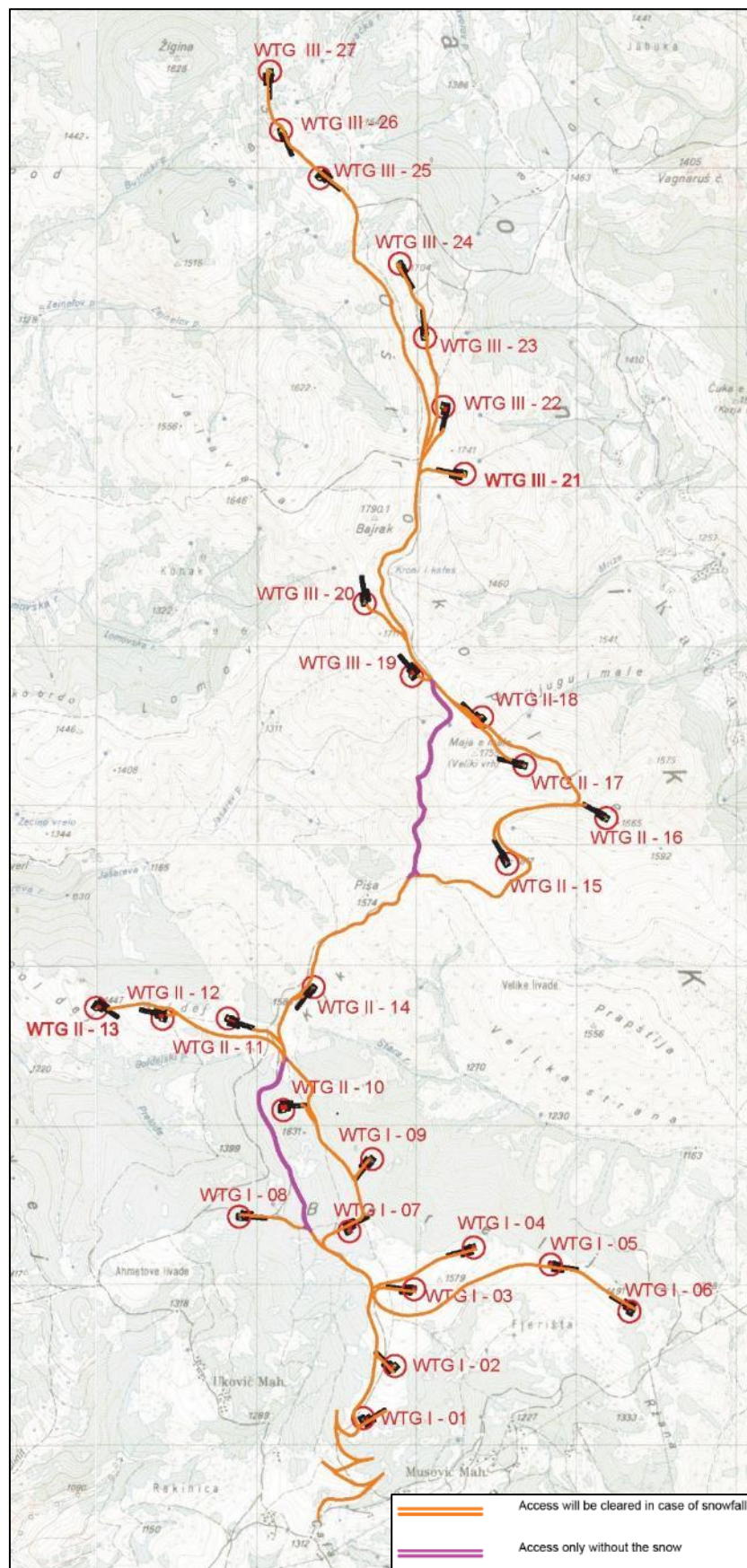


Figure 13: Outline of access roads in the Wind Farm area in case of snow

Earthquakes: the Emergency Response Plan will include measures to be adopted for workers both during the construction and the operation phase, to avoid safety risks in case of earthquakes. Project elements, particularly pylons and WTGs have been designed so to withstand effects of earthquakes, therefore no specific risks are expected.

Landslides: In mountain areas main geohazard are related to accelerated erosion phenomena, landslides and avalanches. In the Wind Farm area, no relevant landslide phenomena were observed during site visit and investigations carried out. No large rock slope with high inclination stand above wind turbine locations or access roads, therefore no relevant rockfall phenomena are expected in the area. , and therefore no specific risks for workers are expected. Some evidences of accelerated erosion phenomena induced by running meteoric water may be observed in correspondence to slopes and secondary streams close to watershed areas (Figure 14).

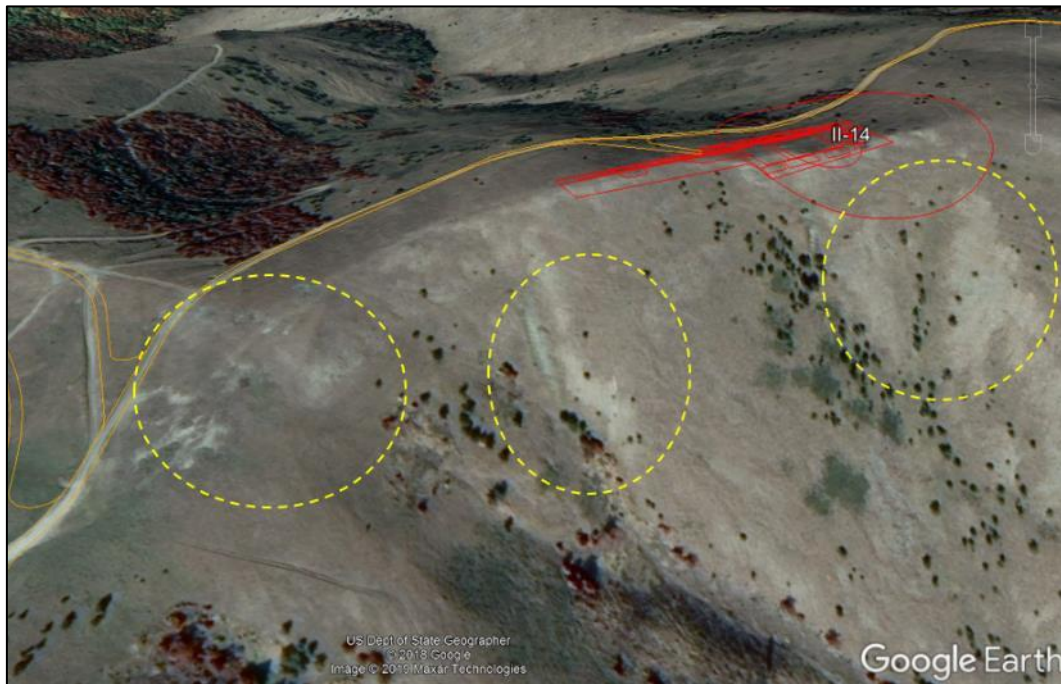


Figure 14: Evidences of accelerated erosion phenomena (yellow dashed lines) in wind turbine II-14 area

Wind Farm areas are mainly located in zones prone to medium erosion; only wind turbines II-15 to II-17 appear to be located in zones prone to strong erosion phenomena.

Volcanoes: no volcanoes are present in the area, therefore no risks are expected.

7.4.2 Vulnerability to incidents

The following table summarizes potential negative impacts that can derive from the project's vulnerability to incidents.

The table lists potential incidents that can occur considering the type of project and activities performed. Based on these incidents, the possible effects that can occur within the present project have been listed; a degree of risk is defined and synthesizes the magnitude of damage that can be caused by related incidents. The potential components that can be impacted are listed in the last column.

Table 82: Summary of risks that can derive from incidents

| Incident | Effects | | | | Degree of risk | | | | Impacted components |
|---------------------|------------|----------------|--|--|----------------|-----|--------|------|---|
| | Explosions | Internal fires | Emission of pollutants in the atmosphere | Emission of pollutants in soil and groundwater | Negligible | Low | Medium | High | |
| Vehicle accidents | X | X | X | X | X | | | | Soil and land use Hydrology and surface water Community health, safety and security |
| Fires | X | X | X | - | X | | | | Soil and land use Hydrology and surface water Community health, safety and security |
| Structural collapse | X | X | X | X | X | - | - | - | Soil and land use Hydrology and surface water Community health, safety and security |

A brief description of main risks and impacts expected due to incidents is presented below.

Vehicle accidents: accidents with vehicles are one of the main risks in construction sites and can have effects not only on workers, but also on surrounding communities, particularly when Project vehicles will be driving on public roads. For this reason extensive mitigation measures will be put in place and a specific Traffic Management Plan has been produced to ensure to the extent possible safe driving conditions for workers and local communities.

Fires: during construction, limited amounts of flammable products will be used (mainly gasoline for vehicles), therefore the risk of fires generated by Project activities is limited. During the operation phase, risks of fires caused by the project are extremely limited, as no flammable products will be used.

Structural collapse: Project elements, particularly OHL pylons and WTGs have been designed to withstand extreme weather conditions and damages that may occur over time. In addition maintenance and monitoring activities will be performed throughout the entire operation phase, to ensure that possible damages are addressed promptly. For this reason the risks of structural collapse, and possible impacts it may generate on the surroundings and on communities is considered extremely low.

7.5 Project impacts during the decommissioning phase

The decommissioning phase will occur in 25 years' time, when baseline conditions will possibly be very different from the current ones and the technologies may have significantly evolved. In the present report, the impacts that will occur in the decommissioning phase are not assessed using the same methodology of the construction and operation phase, due to these uncertainties mentioned above, which make it difficult to provide a sound assessment. A specific decommissioning plan will be prepared by the Project operator at least two years before the project decommissioning. It will include an impact assessment and will identify a series of mitigation measures, that will derive from those applied during the construction and operation phase, and will also make use of the experience garnered over the years.

A general description of the main positive and negative impacts on the physical, biodiversity and social components is provided. Some of the main aspects to take into consideration for the assessment of the decommissioning phase are described below:

- At the end of the operation, phase the wind turbines will be completely dismantled. Based on technologies currently available, about 80% of the materials can be recycled.
- The foundations will be dismantled by blasting and the material may be used as recycling material afterwards.
- The crane pads and storage areas that are needed for operational phase only will be covered with top soil and revegetated
- The steep slopes alongside the crane pads will be adjusted to rebuilt it to a more natural structure and revegetated

Based on the considerations listed above, the following **project actions** are foreseen in the decommissioning phase and will generate impact factors:

- Mobilization of vehicles, personnel and equipment, transport of dismantled material
- Demolition/dismantling activities
- Disposal of waste deriving from dismantling/demolition
- Environmental restoration of the project areas and construction site

The potential impacts deriving from the above actions are associated with the following **impact factors**:

- Emission of greenhouse gases;
- Changing in climatic patterns;
- Emission of dust and particulate matter;
- Emission of gaseous pollutants;
- Emission of noise and vibration;
- Change in the local morphology;
- Removal/degradation of soil and vegetation;
- Change in the local hydrology;
- Landscape features alteration;

- Vegetation and topsoil restoration;
- Demand for waste disposal services;
- Change in land use and ownership;
- Demand for workforce;
- Demand for goods, materials and services;
- Increase of traffic;
- Interruption/limitation of infrastructures/services;
- Influx of workers.

In general, impact factors generated by the Project during the decommissioning phase on the different components will be similar to those generated during the construction phase, but will have a more reduced impacts. The decommissioning phase will include activities such as vehicle traffic, use of machinery and equipment, mobilization of workers and so on. Construction sites and temporary storage areas will likely have to be created, particularly in proximity to the WTGs and the OHL pylons. These activities will generate a series of impact factors similar to those of the construction phase, such as increase of traffic, emission of noise and vibration, emission of dust and particular matter and so on. However, as mentioned, these impacts will be of more limited scale compared to the construction phase, because decommissioning activities will occur over a shorter timeframe and will involve a smaller number of workers. Decommissioning will also include the reinstatement and revegetation of all areas directly impacted by Project elements. Post-closure activities will continue until the stabilization of environmental impacts, which may last longer will be scrutinized through an environmental monitoring program

The same mitigation measures applied during the construction phase will be applied; in addition, new mitigation measures that may be necessary or possible due to changed baseline conditions or evolved technologies will be identified and applied. Based on the considerations above, residual impacts during the decommissioning phase on the different components will be similar to those described above for the construction phase or of smaller scale

At the end of the decommissioning phase, when areas will have been fully reinstated and revegetated, impacts on biodiversity and on habitats will be positive, considering that the number of natural areas will increase compared to the operation phase. Likewise, potential impacts on birds and bats generated during the operation phase will cease.

From a social perspective, the decommissioning of the Project will lead to a loss of jobs for the people employed during the operation phase. It should be noted however that the number of workers needed for the operation phase is limited, therefore the impact on the local employment situation will not be significant; the decommissioning plan will include retrenchment strategies and activities to eventually support employees in finding alternative occupations. From the perspective of the energy market, the decommissioning of the Project will cause the loss of the renewable energy produced in the operation phase; it is likely however that technologies will have evolved, and hence the Project will likely be replaced by more efficient energy sources. From a landscape perspective, impacts will be positive, as the intrusions caused on the landscape by the presence of the OHL pylons and of the WTGs will be removed.

Based on the agreements on land acquisition taken with land owners and described in the LALRF, land will be likely returned to the original owners.

7.6 Cumulative Impact Assessment

Cumulative impacts are defined as those “impacts that result from the incremental impact, on areas or resources used or directly impacted by the project, from other existing, planned or reasonably defined developments at the time the risks and impacts identification process is conducted”⁴.

In order to identify the potential for the Project to generate increased impacts due to other developments, as a first step a screening to identify existing, planned or reasonably defined developments that could interfere with the Project was performed through desktop research and through discussions with stakeholders. Possible interferences and increased impacts with these developments were then analysed. Because no major cumulative impacts have been identified, the outcomes of this analysis are presented below in a descriptive form.

With regards to existing developments, the Aol does not currently host major infrastructure systems or productive industries. Most of the Aol is scarcely populated and its main economic activities present consist in farming and animal herding. The largest development currently present in the Aol is represented by the Trepca Mine, a mine very rich in minerals, especially gold, lead and zinc. The mine had more than 24,000 employees until the 1990's and hence played a prominent role in the local context. After the independence of Kosovo, the mine lost its importance due to damages suffered during the war and lack of investments in infrastructure and technology and it now employs only 1,430 people, losing therefore its economic and development role in the area. The mine is therefore currently operating at a reduced scale compared to its potentials. Considering the differences between the mine operations and the Project, no major interferences or cumulative impacts have been identified. Some interferences could potentially occur on traffic and on road use during the construction phase. In order to transport construction material (including the blades and nacelles) to the Project site, the road that passes in proximity to the Trepca Mine in Stan Terg will be used. Interferences with possible Heavy Goods Vehicles used by the Trepca Mine could therefore occur. It should be noted however that transport of materials needed for the Project will not be continuous and will occur for an overall limited period of time. The transport of Project elements of large size (e.g. the blades) will be planned well in advance and will involve the consultation of local authorities and stakeholders, such as the Mine, to ensure that interferences and possible disturbance to local traffic are reduced to a minimum. Should specific interferences between Project vehicles and vehicles used by the mine be identified, appropriate measures will be implemented (e.g. modifying schedule of transport).

With regards to planned or reasonably defined developments, the only one identified that could create interferences with the project is the upgrading of the M2 road which includes the construction of a new 2 dual lane motorway that will pass through Vushtrri and Mitrovice, and will hence cross the OHL route. In the planning and design phase of the OHL this project has been taken into account, and the positioning of the pylons has been performed so to avoid interferences with the footprint of the future motorway. To date it is not known if there will be overlaps between the construction phase of the OHL and the construction phase of the motorway, as there are uncertainties on the progress of this project. If the two construction activities will overlap, some interferences mainly on traffic and on the use of local roads may occur. These interferences will occur only for the construction of the pylons in close proximity to the footprint of the motorway, hence for a limited period of time. Efforts will be made to liaise with the motorway constructor, so to put in place measures to reduce potential cumulative impacts generated by the two projects. Once the OHL will be in operation, no interferences with the motorway are expected. To increase visibility of the OHL and the cables from the motorway, security lights will be placed on the pylons and along the cables.

Finally, no other wind farm developments planned in the Aol or in its surroundings have been identified. No cumulative impacts due to the presence of additional WTGs in the area are therefore expected to date.

⁴ IFC (Good Practice Handbook on Cumulative Impact Assessment and Management, August 2013)



REPORT

Bajgora Wind Project
Environmental and Social Impact Assessment
Section 8 - Environmental and Social Management System Overview

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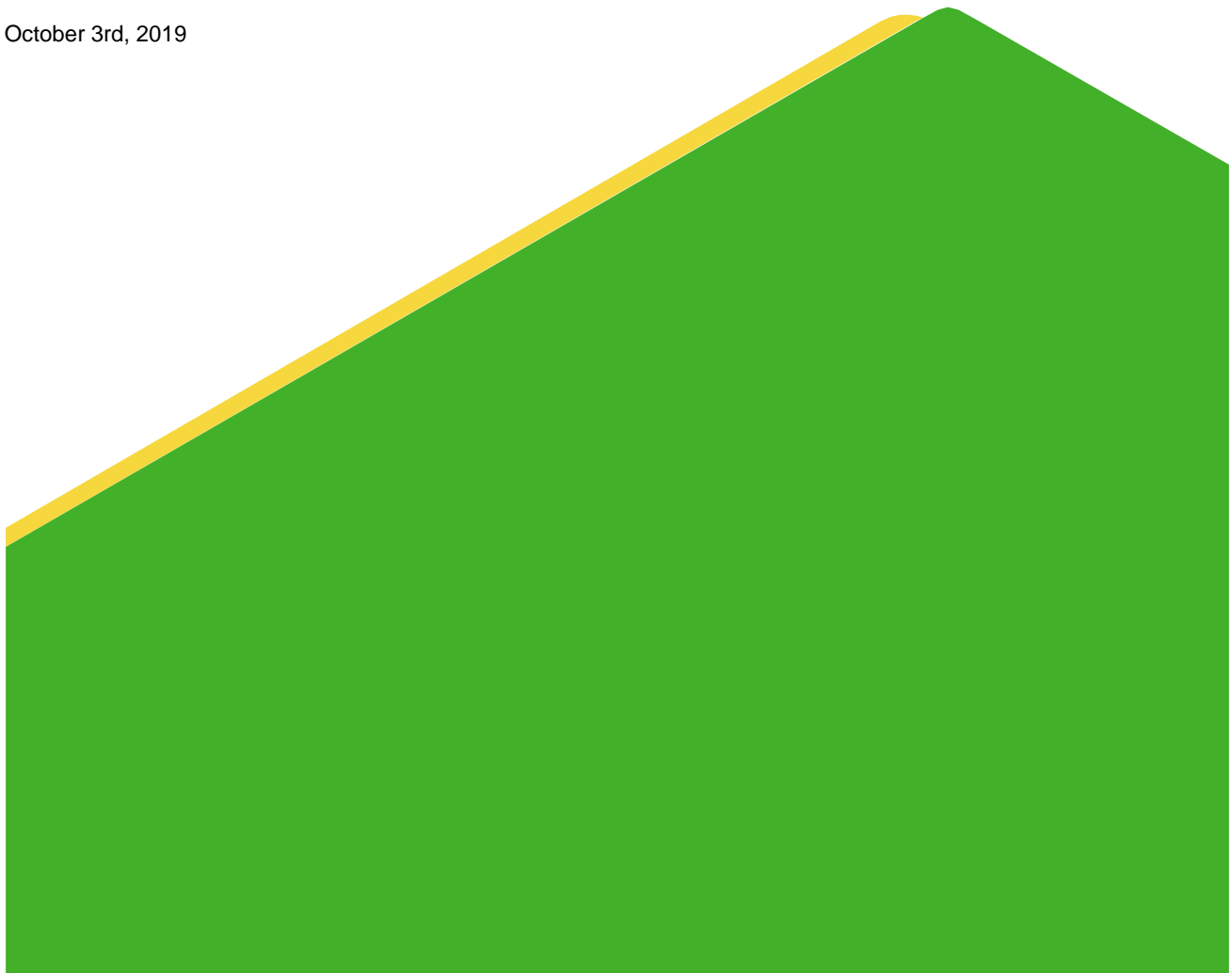


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8.0 ENVIRONMENTAL AND SOCIAL MANAGEMENT SYSTEM (ESMS) PURPOSE AND SCOPE

SOWI will develop an Environmental and Social Management System (ESMS) in order to implement all the mitigation measures identified in the section 7 of this ESIA Report and manage the environmental and social performance of the Project.

The ESMS shall adopt the mitigation hierarchy approach to address adverse environmental or social impacts and issues to workers, affected communities, and the environment from project activities, meaning that the measures shall be aimed at avoiding the generation of environmental or social impacts from the outset of development activities, and where this is not possible, implementing additional measures that would minimise, mitigate and, as a last resort, offset and/or compensate any potential residual adverse impacts.

This section provides an overview of the intended ESMS and lists the associated Environmental and Social Management Plans (ESMPs) addressing specific environmental and social issues. These ESMPs form part of the ESIA DP.

The ESMS will include a set of all the policies, description of roles and organization, procedures, work instructions, management and monitoring plans, records and evidences reporting and management review that will be implemented during the construction and operation phases of the Project. It will provide procedures and instructions to the contractor in charge for the Engineering Procurement and Construction (EPC) activities and other contractors of the Project for addressing environmental and social aspects in line with the Project's regulatory and policy framework and Project standards (see Section 2 of this ESIA Report): these procedures and instructions will be made contractually binding for the EPC contractors. In particular, as outlined by SOWI, the following contracts will be implemented for the operation of the wind farm:

- Full Service Agreement (FSA) with the turbine supplier (General Electric) for operation and maintenance of the turbines
- Balance of Plant (BoP) + Asset Management with another contractor for operation and maintenance of the wind farm (excluding the turbines).

For the Project construction, the contractors listed in the table below will be involved.

Table 1: List of contractors involved in the construction phase

| No. | Works/Services | Company |
|-----|--|--------------------------------------|
| 1 | BoP Contractor | Notus energy Kosovo (Kosovo/Germany) |
| 2 | Civil works access roads and hardstands | GEO Mineral (Kosovo) |
| 3 | Civil works WTG foundations | Schmees Bau (Germany) |
| 4 | - OHL 110 kV - Internal cable lines | Elektrostublla (Kosovo) |
| 5 | - Civil works SS Selac - Internal cable lines - Electrical works SS Selac – primary and secondary electrical equipment - Civil works SS Vushtrri - Electrical works SS Vushtrri | Wibres (Germany) |

| No. | Works/Services | Company |
|-----|--|--|
| | - SCADA (SS and TSO) | |
| 6 | Security | Bajgora Security (Kosovo) |
| 7 | Supervision of constr. Works / Health & safety | H & B consulting (Kosovo) |
| 8 | HSE Manager | Zonnum (Kosovo) |
| 9 | Surveyor | N.SH Geodeti (Kosovo) |
| 10 | Turbine delivery | GE & ZabgrebTrans (US/Germany and Croatia) |
| 11 | Turbine erection | GE (US/Germany) |

The ESMS shall also include a manual (ESMS Manual), an overarching document to ensure the effective implementation of the ESMP, ESAP and regulatory obligations. The manual will be developed in accordance with SOWI policies, with the commitments undertaken in the ESIA and the ESAP, with Kosovo regulatory framework, with EBRD Environmental and Social Policy and Performance Requirements, IFC Performance Standards and IFC General EHS Guidelines and IFC environmental, health, and safety guidelines for wind energy.

At an early stage of the Project (while this ESIA study was in progress and consequently in absence of systematically defined mitigation measures) a Construction Early Management Plan (CEMP) was developed with the aim of managing potential impacts deriving from the early construction activities, such as access road construction. This CEMP defines a number of mitigation measures and is currently being implemented by the Project. The CEMP will be integrated into the ESMS together with other ESMPs.

The ESMS manual and associated ESMPs shall be subject to a systematic review process to ensure their effectiveness. ESMPs that form part of the ESIA DP will be updated and refined prior to the key project stages, notably prior to construction and operations, as will operational ESMS documents.

The overall objective of the ESMS is to define the mitigation, management and monitoring measures for the construction and operation activities in order to:

- adopt a mitigation hierarchy to anticipate and avoid, or where avoidance is not possible, minimise, mitigate, compensation or offset impacts to the environment;
- develop and implement policies, organization, plans and procedures to integrate environmental and social aspects within the overall Project management framework throughout its lifecycle;
- establish a monitoring program to assess the effectiveness of mitigation measures and the effects of residual impacts on the environment;
- report the results of the periodic audits and provide for corrective actions, if necessary, in order to reach the planned objectives.

The purpose of the ESMS Manual should be to define:

- standards for the Project ESMS during the construction and operation phase;

- the scope of the ESMS during the construction and operation phase;
- responsibilities and commitments, for the implementation of the ESMS;
- the framework for the definition and implementation of the mitigation and management measures applicable to the Project;
- provides the framework for the definition, implementation and management of monitoring activities;
- the framework for the review of the environmental and social performance and of the adequacy of the ESMS and ESMPs.

The ESMS shall apply to normal operating conditions during the construction and operation activities. Emergencies conditions shall be addressed in a specific Emergency Response Plan (ERP).

8.1 ESMS Structure

SOWI ESMS is structured as follows:

- SOWI ESHS Policies;
- ESMS Manual;
- Environmental and Social Management Plans (ESMPs);
- Procedures, Work instructions;
- Records/reports evidence of ESMS implementation.

SOWI will prepare a high level, integrated environmental, social, management system (the “ESMS”) to meet the Lenders requirements. Each contractor is expected to put in place their own management arrangements to link to the SOWI ESMS. The management controls established for the Project will be described within an environmental social management plan (“ESMP”) which will include a construction and an operational phase. The framework of these high-level plans will be provided by SOWI. The Contractor (in conjunction with the WTG Supplier) will be required to develop the CEMP and a series of sub plans, including a traffic management/ road safety plan, a noise monitoring plan, a dust abatement plan, a waste management plan, a hazardous materials management plan, an emissions control plan for the concrete batch plant (air and water), a plan to protect public health and safety, and a ‘chance find’ procedure for archaeological artefacts.

Specifically, the WTG Supplier and the Contractors must:

- Ensure that all construction and operational activities are undertaken in compliance with Kosovo E&S and occupational safety and health (“OHS”) regulations as well as International Labour Organisation standards.
- Maintain a very high standard of E&S and OHS performance (in line with Prudent Practices for E&S and OHS).
- Ensure that all ESHS managers are professionally qualified and that suitable ESHS training is provided to all staff (including sub-contractors).
- Manage and monitor the environmental and social risks listed within the ESMP.
- Develop an OHS management plan that will apply to the contractor and their sub-contractors. This plan should consider job and task specific hazard analysis and controls, enforcement of use of personal protective equipment, and safety training for all personnel.

- Maintain a good relationship with the local community and ensure that local farmers can work their land. The ESAP places emphasis on communication with stakeholders.
- Develop a formal grievance mechanism for employees and sub-contractors staff alike.
- As part of bi-weekly progress reports subject to Sub-Clause 5.10 of the Agreement, submit reports to the Owner that will describe (inter alia) the status of legal compliance/ permit conditions, ESHS performance (including OHS incidents, accidents and near misses any new E&S risks). A template will be provided [by the Owner].

The list of ESMPs that need to be implemented for fulfilling the commitments undertaken by SOWI in the ESIA are listed in the table below; they are listed by Performance Requirements of the EBRD. The last two columns indicate whether the plan has been developed for the construction phase, for the operation phase or for both phases. SOWI in the ESIA are listed in the table below; they are listed by Performance Requirements of the EBRD. The last two columns indicate whether the plan has been developed for the construction phase, for the operation phase or for both phases. These ESMPs for part of the ESIA DP.

Table 2: List of ESMPs

| EBRD PR (IFC PS) | Plans / Procedures | CONS. | OP. |
|--|---|---|--|
| PR 1: Assessment and Management of Environmental and Social Impacts and Issues (IFC PS1) | <ul style="list-style-type: none"> ■ ESIA, permit requirements, ESAP ■ ESMS Manual ■ Training and awareness procedures | X X X | X X X |
| PR 2: Labour and Working Conditions (IFC PS2) | <ul style="list-style-type: none"> ■ Human Resources and Labour Procedure and Plan ■ Contractor, Supply Chain Management and Procurement Plan | X X | X X |
| PR 3: Resource Efficiency and Pollution Prevention and Control (IFC PS3 - IFC EHS GL) | <ul style="list-style-type: none"> ■ CEMP (plan for early construction) ■ Pollution Prevention Plan <ul style="list-style-type: none"> ■ Waste ■ Wastewater ■ Air Quality ■ Noise ■ Hazardous Materials ■ Traffic ■ Erosion control and reinstatement | X X X X X X X X X | - X X - - - X - X X |
| PR 4: Health and Safety (IFC PS4 - IFC EHS Guidance) | <ul style="list-style-type: none"> ■ Occupational Health and Safety (OHS) Management Plan ■ Community Health and Safety Management Plan ■ Traffic Management Plan ■ Emergency Preparedness and Response Management Plan ■ Asbestos Management Plan | X X X X X | X - - X - |
| PR 5: Land Acquisition, Involuntary Resettlement and Economic Displacement | <ul style="list-style-type: none"> ■ Land Acquisition, Livelihood and Restoration Management Plan | X | - |

| EBRD PR (IFC PS) | Plans / Procedures | CONS. | OP. |
|--|---|-------|-----|
| (IFC PS5) | | | |
| PR 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources (IFC PS6) | <ul style="list-style-type: none"> Biodiversity Management Plan Biodiversity Action Plan and Biodiversity Offset Strategy (if needed) | X | X |
| PR 7: Indigenous Peoples (IFC PS7) | - Not applicable. | - | - |
| PR 8: Cultural Heritage (IFC PS8) | <ul style="list-style-type: none"> Cultural Heritage Management Plan (including Chance Find Procedure) | X | - |
| PR 10: Information Disclosure and Stakeholder Engagement (IFC PS1 25-36) | <ul style="list-style-type: none"> Stakeholder Engagement Plan (SEP) | X | X |

The ESMS Manual and the related ESMPs encompass, for specific environmental and social aspects, the full management process as conceived by ISO 14001: planning, operating, checking and reviewing.

The Manual shall be therefore structured according to the following scheme:

- Purpose and scope;
- Background policies and standards;
- Organization, roles and responsibilities
- ESMS structure;
- Implementation and operation;
- Links and relations with the EPC contractors and their ESMS
- Reporting;
- Checking (i.e. monitoring and auditing);
- Management review.

The ESMS Manual and the ESMPs shall address environmental and social impacts and issues through a management pattern which includes the:

- definition of roles and responsibilities;
- accounting of impact management;
- handling the best treatment for impact mitigation;
- determination of the appropriate monitoring activities;
- carrying out the auditing processes;
- the reporting stage performing.

8.2 ESMPs structure

ESMPs are structured according to the following scheme:

■ Purpose and scope of the Plan

The section provides a general and systematic description of the requirements, commitments, actions, mitigations etc. the plan intends to implement.

■ Roles and responsibilities

The implementation of the ESMS requires that all the Project involved parties (SOWI, Contractor and Subcontractors) define a dedicated organization with clearly identified responsibilities for managing Environmental, Social, Health and Safety aspects of the Project. Such responsibilities are namely specified in each Plan. Below is an overview of the roles and positions within the Project.

The section describes the roles and positions within the Project (SOWI and Contractor) that is responsible for the implementation of the Plan or for ensuring that the Plan is implemented by Contractors. The section clearly states whether implementation plans have to be issued by Contractor.

Table 3: Roles and positions within the Project

| Role | Overall responsibilities | Specific responsibilities |
|--------------------|---|--|
| Management | <ul style="list-style-type: none"> ■ Management will ensure sufficient and qualified resources are allocated on an ongoing basis to achieve effective implementation of actions, measures and monitoring activities under SOWI's responsibility. ■ This will include the selection of specialized contractor(s) for specific tasks to be carried out as part of the implementation of the ESMS such as (but not limited to) management surveys, monitoring activities and data analysis and reporting; ■ designating specific personnel on site or at the administrative level, clearly define their roles and responsibilities within the environmental and social management system. | <ul style="list-style-type: none"> ■ Final approval of this Manual and of the related ESMPs and contractor and subcontractors' plans/procedures for the Project; ■ Taking appropriate actions to address major Non-Conformities based on audit reports, performance monitoring reports and on SOWI HSE Manager proposed approach |
| HSE Manager | <ul style="list-style-type: none"> ■ Ensuring that this Manual and related ESMPs are up to date and appropriate to the nature and scale of the Project and ensuring that they are implemented effectively; ■ Programming inspections and audit activities to ensure the correct implementation of this Manual and related ESMPs; and of specialized contractor(s) | <ul style="list-style-type: none"> ■ Ensuring that action/measures and monitoring activities directly under SOWI responsibilities are carried out timely and adequately according to the requirements of this Manual and related ESMPs; ■ addressing Non-Conformities through the definition of Preventive/Corrective actions proposing to Management, if necessary, amendments and/or |

| Role | Overall responsibilities | Specific responsibilities |
|---|--|--|
| | tasks <ul style="list-style-type: none"> Collecting, organizing and reviewing monitoring data and performance monitoring reports provided by the specialized contractor(s) and providing summary results of such reports to Management, to stakeholders and to the Lenders | updates to this Manual and related ESMPs and issuing revisions; <ul style="list-style-type: none"> bringing major Non-Conformities immediately to the attention of Management; |
| EPC contractors and subcontractors | <ul style="list-style-type: none"> effective execution of the specific tasks assigned in conformity with this manual, with the ESMPs and with contractual arrangements; respect of EHS requirements included in the ESMS; agree with the timing and logistics of the monitoring activities. | <ul style="list-style-type: none"> provide relevant monitoring data and monitoring reports to as indicated in this manual and in the related ESMPs; may propose changes and integrations to the monitoring activities included in this manual and in the related ESMPs; the proposed changes shall be evaluated and approved by HSE Manager and by Management. |
| All employees and contractors | <ul style="list-style-type: none"> Comply with environmental management requirements. Report any activities which are causing unnecessary biodiversity issues. | <ul style="list-style-type: none"> Give evidence that the relevant mitigation measures identified in the current ESMPs are being properly considered, implemented and monitored during execution of the works. |

■ Background Policies and Standards

The section includes policies, standards and requirements of reference for the Plan. It may include lists or tables with key performance indicators and targets set by legislation or standards. The following subsections provide a list of the source documents for the requirements included in the plan (see section “Legal and Other Requirements” of this Manual).

- National standards and regulations
- International standards
- ESIA
- Other Source documents (e.g. permits).

■ Mitigation measures

The section presents mitigation actions and measures (derived from source documents) that each plan intends to implement. It establishes a clear link between commitments (derived from source documents) and mitigation actions/measures required and between and mitigation actions/measures and acceptance criteria. Clear responsibilities are assigned to ensure that each action has a responsible party (SOWI, Contractor, Subcontractors) for its implementation (see also section “Operational Control” of this Manual). The mitigation hierarchy includes:

- Avoidance: to prevent the occurrence of impacts;
- Minimization: to ensure minimal damage is produced by the impacts;
- Reduction: to reduce the extent of the impact through management practices and/or change in our methodology;
- Compensation (offset): to compensate for the impacts in the development site.

■ **Monitoring actions**

The section presents monitoring (intended as measurements) actions that each plan intends to implement. Monitoring activities and related reporting are addressed in the ESMPs and in particular in the sections “Monitoring (measurements)” and “Reporting”, consistently with its ESHS Policies and the commitments included in the ESIA. It clearly identifies measurement methodologies, KPI, targets/acceptance criteria and any mandatory limits (and the relative source document). Clear responsibilities are assigned to ensure that each monitoring action has a responsible party (SOWI, Contractor, Subcontractors) for its implementation (see also section “Monitoring (measurements)” of this Manual).

■ **Audit and review**

The section includes the audit and review scheme for ensuring the correct implementation of the ESMS. It is an internal inspection and audit system to periodically and effectively verify:

- Correct implementation of ESHS Policies, of the ESMS Manual, of the ESMPs and conformity to the requirements set therein;
- Correct implementation of Contractor’s Plans (descending from SOWI ESMPs requirements);
- Project operation compliance to the national regulatory requirements (Kosovo legislation and relevant permits), to the ESIA commitments and to the IFC Performance Standards;
- Contractor meets its contractual obligations.

■ **Reporting**

The section defines requirements for reporting the results of the monitoring activities and the performance against Targets/Acceptance criteria set out in the plan, as well as reporting frequency and responsibilities.



REPORT

Bajgora Wind Project
Environmental and Social Impact Assessment
Section 9 - Conclusions

Submitted to:

SOWI Kosovo LLC

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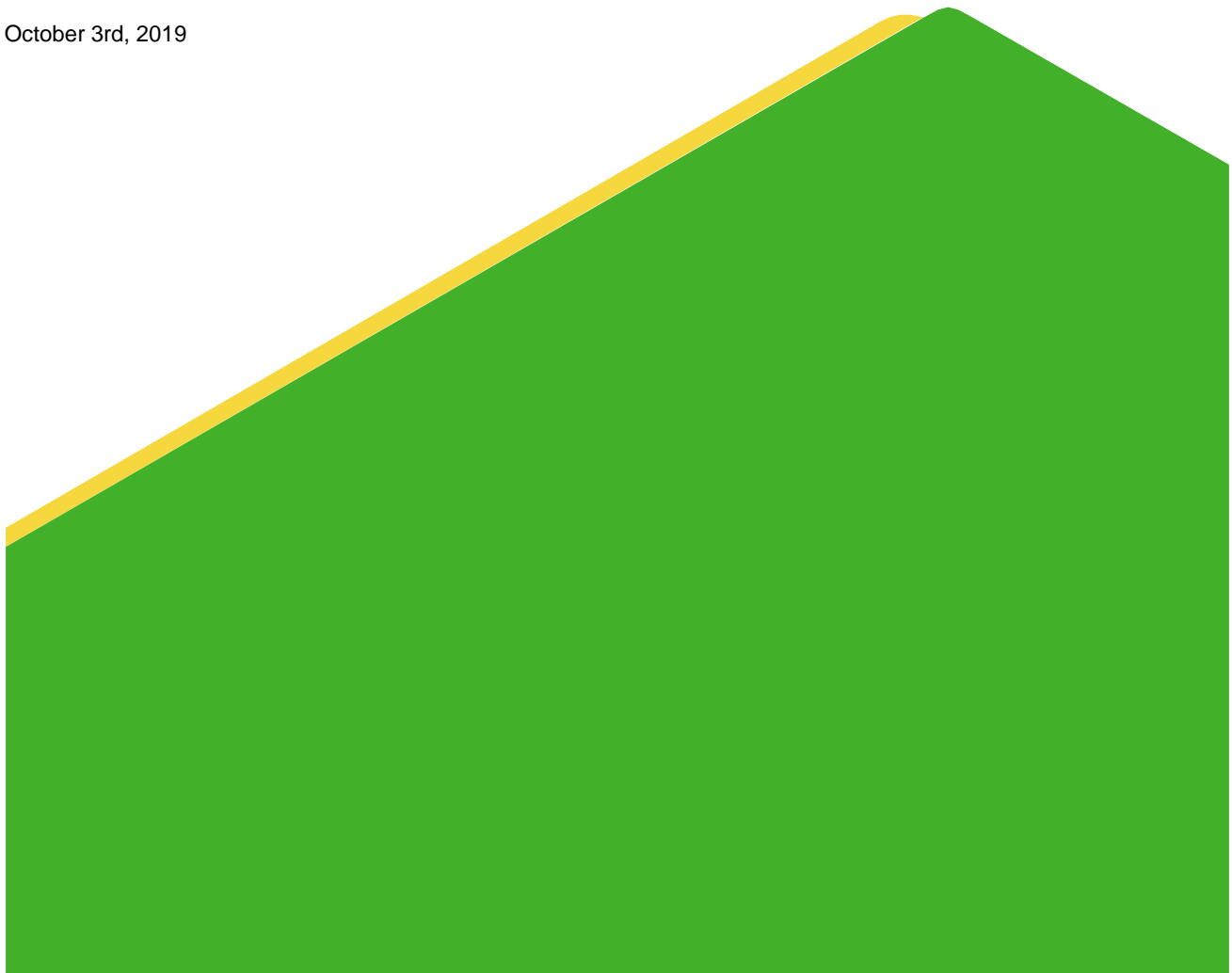


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9.0 CONCLUSIONS

The assessment of impacts has been performed based on the methodology described in section 5 of the present ESIA. The table below presents the value of the residual impact (impact after the application of mitigation measures) that the project is expected to generate on the different components during the construction and operation phase. Because of the different characteristics of the two project components (wind farm and overhead line), for most components the assessment has been performed separately and two impact values are obtained. Values of impacts go from negligible to high; cells coloured in green indicate a positive impacts, cells coloured in red indicate a negative impact.

Table 1: Summary of project residual impacts

| Component | Project element | Construction phase | Operation phase |
|--------------------------------|-----------------|--------------------|---|
| Physical components | | | |
| Geomorphology and topography | Wind Farm | Medium | - |
| | Overhead Line | Low | - |
| Geology and seismicity | Wind Farm | Low | Low |
| | Overhead Line | Low | Low |
| Soils and land use | Wind Farm | Medium | - |
| | Overhead Line | Low | - |
| Hydrology and surface water | Wind Farm | Low | Low |
| | Overhead Line | Negligible | Negligible |
| Climate and climate risks | Wind Farm | Negligible | Low |
| | Overhead Line | Negligible | Low |
| Air quality | Wind Farm | Low | Negligible |
| | Overhead Line | Negligible | Negligible |
| Noise and vibration | Wind Farm | Negligible | Low |
| | Overhead Line | Negligible | Negligible |
| Biodiversity components | | | |
| Biodiversity | Wind Farm | Low | General biodiversity = Low Birds and Bats = Negligible |
| | Overhead Line | Negligible | Negligible |
| Key Biodiversity | WF | Low | Low |

| Component | Project element | Construction phase | Operation phase |
|---------------------------------------|-----------------|--------------------|-----------------|
| Features | Overhead Line | Negligible | Negligible |
| Socio-economic components | | | |
| Economy, employment and livelihood | Wind Farm | Medium | Medium |
| | Overhead Line | | |
| Education | Wind Farm | Negligible | - |
| | Overhead Line | | - |
| Land use and ownership | Wind Farm | Low | Negligible |
| | Overhead Line | Low | Negligible |
| Community health, safety and security | Wind Farm | Negligible | Low |
| | Overhead Line | | |
| Transportation and traffic | Wind Farm | Negligible | - |
| | Overhead Line | | - |
| Housing and infrastructures | Wind Farm | Low | Low |
| | Overhead Line | | |
| Ecosystem services | Wind Farm | Medium | Medium |
| | Overhead Line | | |
| Cultural heritage and archaeology | Wind Farm | Negligible | - |
| | Overhead Line | | |
| Landscape and visual quality | Wind Farm | - | Medium-high |
| | Overhead Line | - | |

As indicated in the table above, during the construction phase negative residual impacts will be more significant on the geomorphology and topography component, due to the need to earthworks for the construction of access roads and of WTG foundations. In addition negative residual impacts will occur on the ecosystem services component, mainly due to Project effects on forests, which represent for local communities an important source of wood for heating and cooking. For other components residual impacts have been assessed to be low or negligible. Impacts on biodiversity during construction will be low or negligible, as the impacted areas are mainly occupied by degraded natural habitats and the duration of the construction works is relatively short. Specific mitigation measures have been designed to ensure the conservation of some flora species through translocation and on-site protection. During the construction phase

positive impacts will occur on the economy, employment and livelihood component, thanks to employment opportunities in a context that suffers from high levels of unemployment.

During the operation phase, negative residual impacts will occur on the landscape and visual quality component, due to the introduction in the landscape of WTGs and OHL pylons, which are anthropic elements which can be only be partially mitigated. Impacts of wind farms on biodiversity during operation are mainly directed to birds and bats, due to the risk of collision. Birds and bats' studies conducted to date are showing a negligible impact due to the absence of a significant birds' migration and to a low density of bats. Mitigation measures to reduce impact risks have been designed and monitoring during the first years of operation will be conducted to determine the need of further measures, including programmed shut-down and/or increase of the cut-in wind speed. Birds diverters will be installed in the Overhead line at the crossing of the Sitnica river, which is a minor migration corridor for aquatic birds' species. During the operation phase positive impacts will occur on the economy, employment and livelihood component, thanks to employment opportunities and to the production of energy from renewable sources, which will overall strengthen and improve the power sector of Kosovo.



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