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#ЕУ ЗА ТЕБЕ

RAILWAY LINE BELGRADE–NIŠ, SECTION III PARAĆIN TO TRUPALE (NIŠ) Environmental and Social Impact Assessment, BIODIVERSITY MANAGEMENT PLAN

EU PPF
PROJECT PREPARATION FACILITY

Republic of Serbia
Ministry of European Integration

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EU PPF - PROJECT PREPARATION FACILITY

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Key Contacts			
EUD	Anthony Robert	Programme Manager	Delegation of the European Union to the Republic of Serbia Vladimira Popovica 40/V, 11070 New Belgrade, Republic of Serbia Phone: +381 11 3083200 Anthony.ROBERT@eeas.europa.eu
MEI	Aleksandra Todorović	MEI's Representative	Ministry of European Integration Nemanjina 34, 11000 Belgrade, Republic of Serbia atodorovic@mei.gov.rs
	Branko Budimir	Advisor to the Minister of European Integration	Ministry of European Integration Nemanjina 34, 11000 Belgrade, Republic of Serbia branko.budimir@mei.gov.rs
SUEZ Consulting (SAFEGE) Office in Serbia	Željko Tmušić	Project Director	Ul. Beogradska 27, 11000 Belgrade, Republic of Serbia Phone: +381 11 32 34 730 zeljko.tmusic@suez.com
	Dušan Rakić	Project Manager	Ul. Beogradska 27, 11000 Belgrade, Republic of Serbia Phone: +381 11 32 34 730 dusan.rakic@suez.com
	Darko Jakšić	Team Leader	Ul. Beogradska 27, 11000 Belgrade, Republic of Serbia Phone: +381 11 32 34 730 jaksic@zeelandnet.nl
	Miodrag Uljarević	Deputy Team Leader	Ul. Beogradska 27, 11000 Belgrade, Republic of Serbia Phone: +381 11 32 34 730 miodrag.uljarevic@suez.com

CONTENTS

LIST OF TABLES

LIST OF FIGURES

1. INTRODUCTION

1.1. Background

The Belgrade to Niš Railway Corridor Rehabilitation Project is being proposed to facilitate the provision of a modern, high speed, double-track railway line for both passenger and freight rail traffic between Belgrade and Niš. After years of poor maintenance and a lack of investment, the condition of the existing railway infrastructure on this route is unsatisfactory, operational speeds are significantly limited, and electrical equipment is outdated. The aim of the Corridor Rehabilitation Project is to modernise the existing railway infrastructure, increase the railway's capacity, and align with the safety requirements and quality of service of the South-East Europe Transport Observatory (SEETO) Corridor X (a pan-European rail corridor running through Serbia), of which it forms a part. As such, the conceptual design for the railway is aligned with all Technical Specifications for Interoperability (TSIs) as defined in Directive 2016/797 on the interoperability of the rail system within the EU.

The Corridor Rehabilitation Project has been divided into three Sections for the purposes of further Project development:

- **Section 1:** Belgrade (Resnik) to Velika Plana,
- **Section 2**: Velika Plana to Paraćin,
- **Section 3:** Paraćin to Trupale (Niš), excluding the section from Stalać to Đunis which is being addressed separately and is in a more advanced stage of Project preparation.

The key objectives of the Corridor Rehabilitation Project are to:

- Increase rail speeds from a maximum of 160 km/h to up to 200 km/h, whilst enhancing the quality of passenger and freight rail services.
- Enhance the sustainability and safety of the national transport system;
- Improve the efficiency of the existing rail transport system;
- Facilitate a shift to sustainable, accessible and inclusive modes of public transport at the national level.

This Biodiversity Management Plan (BMP) covers the Paraćin to Trupale (Niš), Section (Section 3) of the Belgrade to Niš Railway Corridor (the Project).

1.2. Project Description

Spatially, the Project can be viewed as two sub-sections: Paraćin-Stalać and Đunis-Trupale. The Paraćin–Stalać sub-section runs from km 153+380 to km 174+170.79, with a total length of 20.8 km. The Đunis–Trupale sub-section runs from km 191+937.96 to km 229+642, with a total length of 37.7 km.

The Project route within the Paraćin-Stalać sub-section does not deviate significantly from the existing railway alignment. Where the existing alignment does not allow for the proposed design speed of up to 200 km/h, minor

deviations may be necessary to increase the length of curves in the track. The two existing stations (Paraćin and Ćićevac) will be retained but reconstructed and modernized. Additionally, the existing Sikirica–Ratare stop will be upgraded to be a station. Two existing stops, Drenovac and Lučine, will be decommissioned.

On the majority of the Đunis–Trupale sub-section of the Project route, the radius of the curves does not meet the requirements for a design speed of 200 km/h. The alignment has therefore been revised in places to allow for increasing the radius of curves and milder turning angles. The existing Korman, Adrovac, Aleksinac, Lužane, and Trupale stations will be retained and reconstructed for modernization. The existing Tešica stop will be fully modernized and reconstructed to become a station. The existing Vitkovac, Donji Ljubeš, Gornji Ljubeš, Trnjane, Norzina, Supovački most, Mezgraja and Vrtište stops will be decommissioned. The existing Grejač station will also be decommissioned.

The preliminary design of the Project has determined the locations where new bridges will be constructed, as well as underpasses and overpasses.

Twelve existing bridges over watercourses within the Project route alignment will be demolished and replaced with newly constructed bridges, i.e. no bridges will be refurbished. Additionally, a completely new bridge is planned at km 223+054 over the Južna Morava River, as the Project route has been realigned. The Project route also crosses a further 4 streams, but these are culverted at the point of intersection with the railway. There will also be 2 new viaducts.

At km 205+958, a replacement bridge over the Suvi stream is planned. The hydrotechnical conditions of this location require that the existing stream be moved ~22m to the south. However, the stream is ephemeral and only flows during periods of heavy rainfall or during snow melt and as such, no significant biodiversity impacts are anticipated as a result of moving the stream.

There is one location where bridge piers will need to be installed within the riverbed. This is at km 223+054, where construction of the new bridge over the Južna Morava River will include the construction of 2 piers of 2.0m width within the riverbed at this location. There are no other rivers where bridge piers will be constructed in the riverbed.

All 48 of the existing road level crossings will be abolished and replaced with 30 new deleveled crossings (i.e. not level with the railway including overpasses and underpasses) at the following chainages: Overpass at km 153+941.53, Underpass at km 155+991.45, Underpass at km 156+851.81, Underpass at km 158+955.08, Underpass at km 162+505.32, Underpass at km 164+502.60, Underpass at km 166+669.98, Overpass at km 169+150.51, Overpass at km 170+132.23, Underpass at km 171+793.08, Overpass at km 172+515.95, Underpass at km 173+134.14, Overpass at km 193+051.67, Underpass at km 194+665.63, Underpass at km 196+164.67, Underpass at km 197+383.93, Underpass at km 200+277.95, Underpass at km 202+340.17, Underpass at km 205+802.46, Underpass at km 206+821.81, Underpass at km 208+746.36, Overpass at km 210+360.94, Overpass at km

212+668.35, Overpass at km 214+249.68, Underpass at km 217+044.45, Overpass at km 219+404.75, Overpass at km 221+359.49, Underpass at km 223+500.00, Overpass at km 227+126.66, Underpass at km 229+419.58.

The Đunis tunnel will be newly constructed as part of the Project and will be 580 m in length. The entrance portal is at km 192+274, and the exit portal is at km 192+854. At the entrance and exit points of the tunnel, the construction approach will be cut-and-cover.

Given the category of the railway line and the design speed of up to 200 km/h, the design envisages that the railway line will be fenced with the type of fence used for highways. The purpose of the fence is to protect against and deter unauthorized/uncontrolled access to railway facilities and equipment by people and animals (thus reducing the risk of accidents or collisions and vandalism). A 1.80 m high (minimum) fence will be installed on both sides of the railway line, at a distance of 1.0m from the toe of the embankment. A 5 m wide zone will be reserved outside of the fence for service roads.

2. SCOPE OF THE BIODIVERSITY MANAGEMENT PLAN

This Biodiversity Management Plan (BMP) has been developed based on the information on Section 3 (Paraćin-Trupale) in the Preliminary feasibility study (PFS) on "Reconstruction and modernization of the railway line Belgrade-Niš" (2022) and the ESIA Report for Section 3 Paraćin-Trupale (2025), inclusive of an Appropriate Assessment.

This BMP was prepared on the basis of field and desk surveys. Field surveys of biodiversity along the planned Project route were conducted during the winter, spring, summer and autumn of 2023.

This BMP has been developed to guide the implementation of the Project's biodiversity commitments following the European Bank for Reconstruction and Development's (EBRD) Performance Requirement 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources (PR6, 2019), and the European Investment Bank's (EIB) Environmental and Social Standard 4 on Biodiversity and Ecosystems (2022). In addition, implementation of this BMP will ensure the Project's compliance with biodiversity obligations according to Serbian legislation and standards.

This is achieved by:

- Providing an overview of the biodiversity legislation and standards applicable to the Project.
- Defining roles and responsibilities for the management of biodiversity.
- Defining a mitigation strategy based on the mitigation hierarchy, which anticipates, avoids, or where avoidance is not possible, minimizes and restores impacts to biodiversity and, as such, achieves 'no net loss' of biodiversity and where possible 'net gain'.
- Defining a monitoring program to assess the effects of residual impacts on biodiversity.
- Reporting on the results of the periodic reports and audits and providing for corrective actions, if necessary, to reach the plan objectives.

The requirements in this BMP apply to EPC Contractors and sub-contractors during the pre-construction and construction phase, and SRI and maintenance contractors during the operation phase, as well as all Project activities. All Project personnel must be made aware of the requirements of this Plan.

Biodiversity management activities defined in this Plan apply to direct and indirect impact areas associated with Project activities and infrastructure (including a 30 m '**working corridor**' on either side of the railway during construction, a 15 m '**maintenance area**' corridor on either side of the railway during operations), as well as activities that potentially impact biodiversity in the wider Project area (i.e. the Project Area of Influence (PAoI) of 500 m on either side of the railway tracks as well as an area of up to 5 km from the AoI incorporating protected areas).

This BMP focuses on the biodiversity features that may be impacted by the Project, including critical habitat, priority biodiversity features and invasive plant species.

Given the challenge of accurately and comprehensively predicting the impacts of a certain Project on biodiversity over a long time period, the aim is to implement adaptive management in which the implementation of mitigation and management measures are responsive to changing conditions and the results of monitoring throughout the Project's lifecycle.

This BMP was designed to document the results of the assessments on the status and sensitivity of different groups of species and mitigation measures. It also contains specific monitoring measures for improving the status of the species due to the construction of the railway.

Internal training of Contractor´s workers on main provisions of the Plan must be carried out before the start of construction works. Records of trained personnel must be kept and regularly updated.

3. ROLES AND RESPONSIBILITIES

Principal roles and responsibilities for the implementation of the BMP are outlined in **Error! Reference source not found.**Table 3-1 below.

Table 3-1. Key Roles and Responsibilities

Roles	Responsibility	Project phase
Company (SRI)	Ensuring the BMP is included in the Tender Documentation for the Contractor. Review and Approve Management of Change requests as per the Management of Change procedure. Implementation of mitigation measures during the operation stage as defined in this BMP, ensuring these are included into the OESMP. Organizing the establishment training for workers and other personnel in operation phase, ensuring biodiversity requirements are included in induction programs and site-specific protocols. Ensuring that operation phase action/measures and monitoring activities are carried out timely and adequately according to the BMP requirements This includes overseeing data collection, analysis, and reporting, and ensuring timely implementation of adaptive management. Engaging suitable biodiversity experts (number, qualification and skills and experience) to implement the requirements of this BMP. Maintain transparent records of all mitigation and monitoring activities and submit regular reports to Lenders and environmental authorities as required to demonstrate compliance. Support continuous improvement by evaluating the effectiveness of measures in place, integrating lessons learned, and updating the BMP as needed based on monitoring results or stakeholder input.	Operation
Supervision Engineer	Supervise and audit the Contractor's implementation of the BMP (includes conducting regular site inspections, reviewing biodiversity-related documentation (e.g., method statements, monitoring reports), and verifying that mitigation actions are implemented effectively and in line with the approved timelines.) Review all Management of Change requests as per the Management of Change procedure, including requests to develop any Project infrastructure in Avoidance Zones. Support capacity-building efforts, such as on-site training and toolbox talks. Ensure corrective actions are implemented promptly when non-compliances or unexpected biodiversity impacts are observed.	Construction/Operation
Contractor	Engage a suitably qualified Ecological Clerk of Works (ECoW). Implement the Management of Change Procedure, including assessment and mitigation of biodiversity impacts as per the mitigation hierarchy. Implementation of the Ecological Chance Finds Procedure as defined in Section 6.1. Implementation of mitigation measures during the pre-construction and construction stage as defined in this BMP. Organizing the establishment training for workers and other personnel.	Pre-construction/Construction

Roles	Responsibility	Project phase
	Ensuring that pre-construction and construction action/measures and monitoring activities are carried out timely and adequately according to the BMP requirements. Inspect the sites and report on the implementation of the mitigation and monitoring measure. Engage suitable biodiversity experts (number, qualification and skills and experience) to implement the requirements of this BMP.	
Contractor's Ecological Clerk of Works (EcoW) (botanist, entomologist, ichthyologist, herpetologist, ornithologist, mammalogist)	Coordinate and perform the implementation of mitigation measures during the construction stage. Monitoring of the BMP implementation. Carry out pre-clearance surveys or, if not specialized for target groups, support the process of engaging experts to perform the surveys. Provide relevant monitoring data and monitoring reports to Contractor. Prepare the manual for construction workers and other personnel on important species and habitats. Design of the training for workers and other personnel. May propose changes and integrations to the mitigation and monitoring activities proposed in the BMP. Advice and support the Contractor to make sure that wildlife laws are not contravened and that any ecological components of the planning consent are complied with. Regular communication with all stakeholders, including national/local authorities and institutions and other relevant bodies, as well as civil society conservation organisations. Ensure all required wildlife monitoring licences are obtained/up to date. Advise on protected species and habitats and provide solutions to any issues that arise during construction works. Provide information to the public.	Pre-construction/Construction

4. PROJECT DESCRIPTION

4.1. Summary of Applicable Project Standards

The following financial institution performance requirements and standards are being applied to the Project specifically concerning biodiversity:

- **EBRD Environmental and Social Policy (2019):** Performance Requirement 6 - Biodiversity Conservation and Sustainable Management of Living Natural Resources;
- **EIB Environmental and Social Policy (2022):** Environmental and Social Standard 4 - Biodiversity and Ecosystems

The Contractor must comply with all relevant national legislation and regulations. These laws are briefly presented below:

National Biodiversity Legislation and Regulations

- Law on Environmental Protection (Official Gazette of the Republic of Serbia, No. 135/04, 36/09, 72/09, 43/11, 14/16, 76/18 and 95/18) - The Law on Environmental Protection is the framework of national environmental law. The law is currently the main legislation relating to environmental protection in Serbia and is harmonized with the Council Directive 2003/105/EC, which amends Council Directive 96/82/EC on the control of major-accident hazards involving dangerous substances (Seveso II Directive).
- Law on Environmental Impact Assessment (Official Gazette of the Republic of Serbia, No. 94/2024) - This Law regulates the EIA process, EIA content, Interested Authorities and organization participation and public participation, international notification for projects that can have important impacts on other environment and inception and other important issues for EIA.
- Law on Air Protection (Official Gazette of the Republic of Serbia, No. 36/09, 10/13 and 26/21) - The Law on Air Protection regulates the management of air quality and determines the measures, manner of organization and control of the implementation of protection and improvement of air quality as a natural value of general interest that enjoys special protection.
- Law on Nature Conservation (Official Gazette of the Republic of Serbia, No. 36/09, 88/10, 91/10, 14/16, 95/18 and 71/21) - This law creates the following objectives:
  - protection, preservation and improvement of biological (genetic, spices and ecosystem), geological and landscape diversity,
  - harmonization of human activities, economic and social development plans, programs, bases and projects with sustainable use of renewable and non-renewable natural resources and long-term preservation of natural ecosystems and natural balance,
  - sustainable use and/or management of natural resources and goods, ensuring their function while preserving natural values and balance of natural ecosystems,
  - timely prevention of human activities and activities that may lead to permanent impoverishment of biological, geological and landscape diversity, as well as disturbances with negative consequences in nature,
  - determining and monitoring the state of nature,
  - improvement of the condition of disturbed parts of nature and landscapes.
- Law on Waste Management (Official Gazette of the Republic of Serbia, No. 36/09, 88/10, 14/16 and 95/18 and 35/23-68) - The Law on Waste Management is harmonized with all relevant EU directives. The Law regulate: types and classification of waste; waste management planning; waste management entities; responsibilities and obligations in

waste management; organization of waste management; managing special waste streams; conditions and procedure for permit issuance; transboundary movement of waste; reporting on waste and database; financing of waste management; supervision, and other issues relevant for waste management.

- Law on Chemicals (Official Gazette of the Republic of Serbia, No. 36/09, 88/10, 92/11, 93/12 and 25/15) - The Law on Chemicals regulates the integrated management of chemicals, their classification, packaging and labeling, register of chemicals and trade of chemicals.
- Water Law (Official Gazette of the Republic of Serbia, No. 30/10, 93/12, 101/16, 95/18 and 95/18 – other law) - The Law on Water which incorporates the EU Water Framework Directive, covers water regimes, water management areas, responsibilities for water management (including sub-law water management legislation), water management activities, limitation of owners' and beneficiaries' rights, water cooperatives, financing of water management activities, and administrative inspection to enforce the Law. The legislation provides for various water management sub-laws on water resource conditions, water resource compliance and water resource permits.
- Law on Environmental Noise Protection (Official Gazette of the Republic of Serbia, No96/21) - The Law on Protection against Environmental Noise, transposes EU Directive 2002/49/EC relating to the assessment and management of environmental noise. The Law has the following main goals: establishment, maintenance and improvement of the system of noise protection on Serbian territory; and determination and realization of measures and standards in the field of noise protection aimed to avoid, prevent, or reduce the harmful effects of noise on human health and the environment.
- Law on safe transport of hazardous goods (Official Gazette of the Republic of Serbia, No. 104/16, 83/18, 95/18 and 10/19) - Law on transport of hazardous materials regulates conditions for performing domestic and international transport of dangerous goods in road, rail and inland waterway transport on the territory of the Republic of Serbia.
- Law on mining and geological explorations (Official Gazette of the Republic of Serbia, No. 101/15, 95/18 and 40/21) - The Law on mining and geological explorations regulate measures and activities of the mineral policy and the manner of implementation thereof, conditions and manner of execution of geological explorations of mineral and other geological resources, researching of geological environment, as well as geological explorations for the purpose of spatial and urban planning, designing, construction of buildings and remediation of site, manner of classification of resources and reserves of mineral raw materials and ground waters, exploitations of reserves of mineral raw materials and geothermal resources, construction, use and maintenance of mining facilities, plants, machines and equipment, execution of mining works, mining waste management, remediation and recultivation of abandoned mining facilities, as well as inspection over the implementation of the present Law.
- Law on Occupational Safety and Health organized (Official Gazette of the Republic of Serbia, No. 101/05, 91/15 and 113/17 -other law) - The Law on Occupational Safety and Health organized governs the occupational safety and health system in Serbia. By harmonizing this law with the ratified International Labor Organization conventions and EU Framework Directive 89/391/EEC, as well as special directives derived from the Framework Directive, all guidelines originating from them have been accepted in a form adjusted to national conditions.
- Law on Occupational Safety and Health organized (Official Gazette of the Republic of Serbia, No. 101/05, 91/15 and 113/17 -other law) - The Law on Occupational Safety and Health organized governs the occupational safety and health system in Serbia. By harmonizing this law with the ratified International Labor Organization conventions and EU Framework Directive 89/391/EEC, as well as special directives derived from the Framework Directive, all guidelines originating from them have been accepted in a form adjusted to national conditions.
- Law on Cultural property (Official Gazette of the Republic of Serbia, No. 6/20 and 35/21- other law) - The Law on Cultural property regulates the system of the protection and use of cultural property and defines conditions for the implementation of activities relating to the protection of cultural property.
- Law on Climate Change (Official Gazette of the Republic of Serbia, No. 26/2021) - This law regulates the system for the limitation of greenhouse gas emissions (hereinafter: GHG) and for adaptation to changed climatic conditions, monitoring and reporting on the strategy of low-carbon development and its improvement, the program of adaptation to changed climatic conditions, adoption of the strategy of low-carbon development and the program of adaptation to

changed climate conditions, issuing permits for GHG emissions to the plant operator, issuing approval to the aircraft operator's monitoring plan, monitoring, reporting, verification and accreditation of verifiers, administrative fees, supervision and other issues of importance for the limitation of GHG emissions and adaptation to changed climatic conditions.

- Law on Soil Protection (Official Gazette of the Republic of Serbia, No. 112/2015) - This law regulates soil protection, systematic monitoring of soil condition and quality, remediation measures, remediation, recultivation, inspection supervision and other matters of importance for the protection and preservation of soil as a natural resource of national interest.
- Law on Non-Ionizing Radiation Protection (Official Gazette of the Republic of Serbia, No. 36/2009) - This law regulates the conditions and measures for the protection of human health and the protection of the environment from the harmful effects of non-ionizing radiation in the use of sources of non-ionizing radiation.
- Protection from professional exposure to sources of non-ionizing radiation is not the subject of this law.
- Also, the Contractors have to comply following international legislation and regulation:
- Water Framework Directive establishing a framework for Community action in the field of water policy (2000/60/EC).
- Directive on the assessment and management of flood risks (2007/60/EC) - Floods Directive.
- Directive 2008/105/EC on environmental quality standards in the field of water policy(amending and subsequently repealing Council Directives 82/176/EEC, 83/513/EEC, 84/156/EEC, 84/491/EEC, 86/280/EEC and amending Directive 2000/60/EC) establishes, among others: (1) limits on concentrations in surface waters of 33 priority substances and 8 other pollutants (Annex I); (2) the possibility of applying Environmental Quality Standards (EQS) for sediment and biota, instead of those for water; (3) the possibility of designating mixing zones adjacent to discharge points where concentrations of the substances in Annex I might be expected to exceed their EQS; and (4) a requirement for Member States to establish an inventory of emissions, discharges and losses of the substances in Annex I.
- Directive 2006/11/EC on Dangerous Substances lays down rules for protection against, and prevention of, pollution resulting from the discharge of certain substances into the aquatic environment of the Community.
- Groundwater Directive 2006/118/EC established a regime that sets groundwater quality standards and introduces measures to prevent or limit inputs of pollutants into groundwater.
- Environmental Noise Directive 2002/49/EC defines a common approach intended to avoid, prevent or reduce on a prioritized basis the harmful effects, including annoyance, due to exposure to environmental noise, including, among other, assessment methods for the noise indicators.
- Directive 2000/14/EC on the approximation of laws of the Member States relating to noise applies to equipment for use outdoors listed in Articles 12 and 13 and defined in Annex I of this Directive.
- Habitats Directive 92/43/EEC aims to contribute towards ensuring biodiversity through the conservation of natural habitats and of wild fauna and flora in the territory of the Member States.
- Birds Directive 2009/147/EC relates to the conservation of all species of naturally occurring birds in the wild state in the territory of the Member States.
- Directive 89/391/EEC – Occupational Health and Safety.
- Regulation (EU) 2018/1999 of the European Parliament and of the Council on the Governance of the Energy Union and Climate Action ('European Climate Law').

5. BIODIVERSITY MANAGEMENT PLAN

5.1. Pre-construction phase

The impact of obstructed species movement may occur in the construction phase and continue through the operation phase but can be mitigated during pre-construction. Also, to avoid potential impacts on EAAAs of PBFs and CHs, E3 habitat type, certain pre-construction mitigation activities are necessary.

The following mitigation activities will need to be programmed to take place before the construction works:

- All habitats that are classified as CH and PBF as well as autochthonous forest with EUNIS code E3 Wet or seasonally wet grasslands, which are inhabited by species triggering CH/PBF designation, have to be marked as **avoidance zones**:
  - C1.33 - Rooted submerged vegetation of eutrophic waterbodies (3150 Natural eutrophic lakes with Magnopotamion or Hydrocharition -type vegetation) – chainages: 225+000 km and 226+000 km and cca 228+000 km.
  - C3.2 Water-fringing reedbeds and tall helophytes other than canes – chainages: cca 223+00 km, cca 225+000 km, cca 227+000 km and cca 228+000 km.
  - E3 Wet or seasonally wet grasslands – chainages: cca 225+000 km, between 225+000 km and 226+000 km and cca 228+000 km.
  - G1 Broadleaved deciduous woodland – chainages: cca 192+200 km, cca 196+000 km, cca 198+000 km, cca 199+000 km.
  - G1.11 Riverine Salix woodlands (*91E0 Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) – chainages: between 192+000 km and 193+000 km, cca 197+000 km, cca 197+000 km, cca 200+000 km, cca 223+000 km, cca 225+000 km, cca 226+000 km, cca 227+000 km and cca 228+000.
  - G1.223 Southeast European *Fraxinus - Quercus - Alnus* forests (91F0 Riparian mixed forests of *Quercus robur,* and *Ulmus laevis Ulmus minor, Fraxinus excelsior* or *Fraxinus angustifolia*, along the great rivers (*Ulmenion minoris*)) – chainages: between 219+000 km and 220+000 km.
  - G1.76 Balkano-Anatolian thermophilous Quercus forests (91M0 Pannonian-Balkanic turkey oak – sessile oak forests) – chainages: between 191+500 km and 195+200 km, between 196+500 km and 197+300 km, between 198+100 km and 199+500 km, between 202+200 km and 203+200 km, between 204+800 km and 205+100 km, between 218+000 km and 219+200 km and cca 205+000 km.
  - All aquatic habitats in riparian zone of Južna Morava River within Project area and wider area.
  - The locations of the habitats that must be delineated as Avoidance Zones are shown in Figure 5-1 to Figure 5-8.

All mentioned habitats that have to be marked as avoidance zones are located within Đunis-Trupale subsection. These natural habitats are not recorded within PAoI of Paraćin-Stalać subsection due to strong anthropogenic pressure.

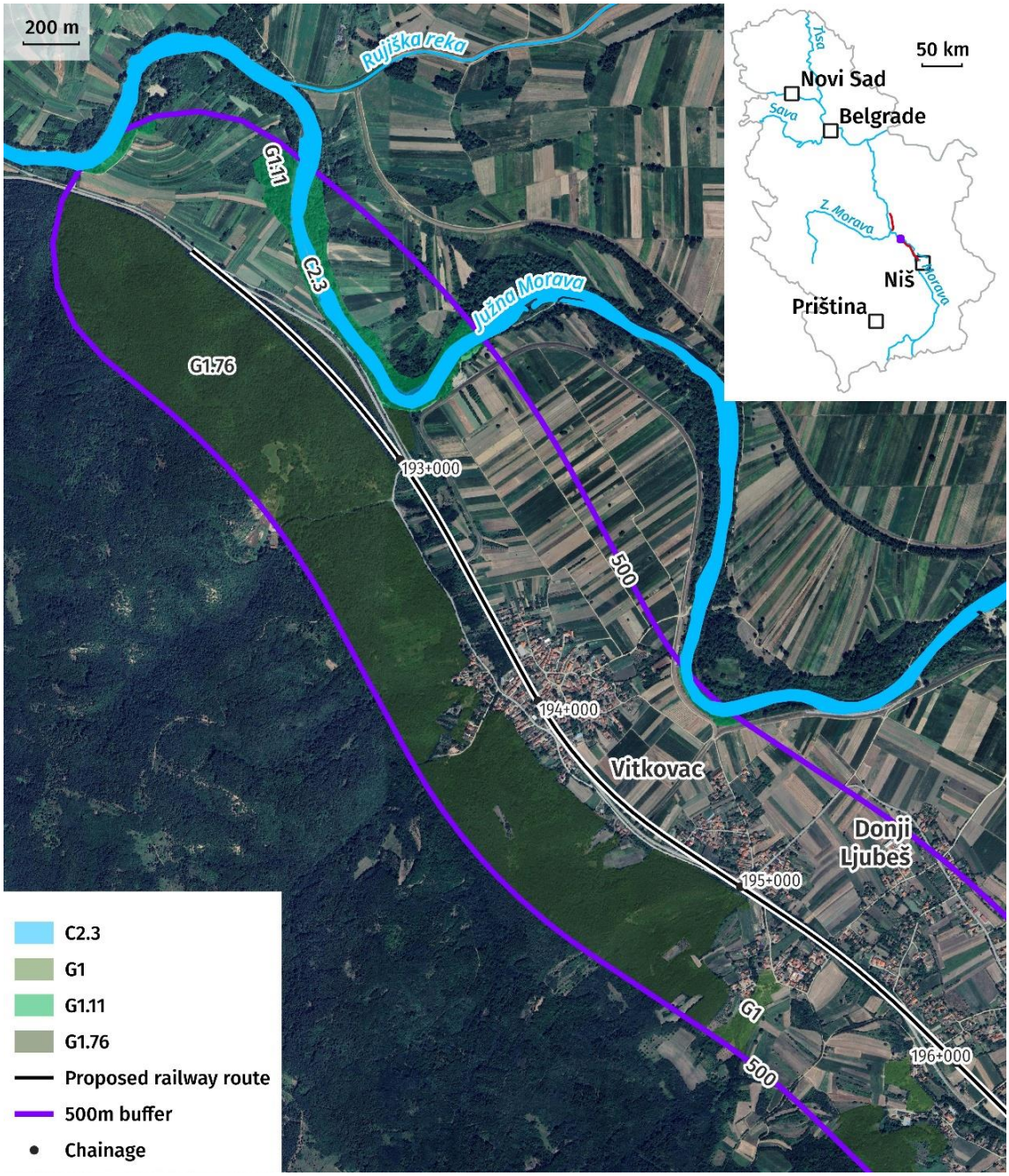

Figure 5-1. Map of the avoidance zones within the Project AoI (segment 1)

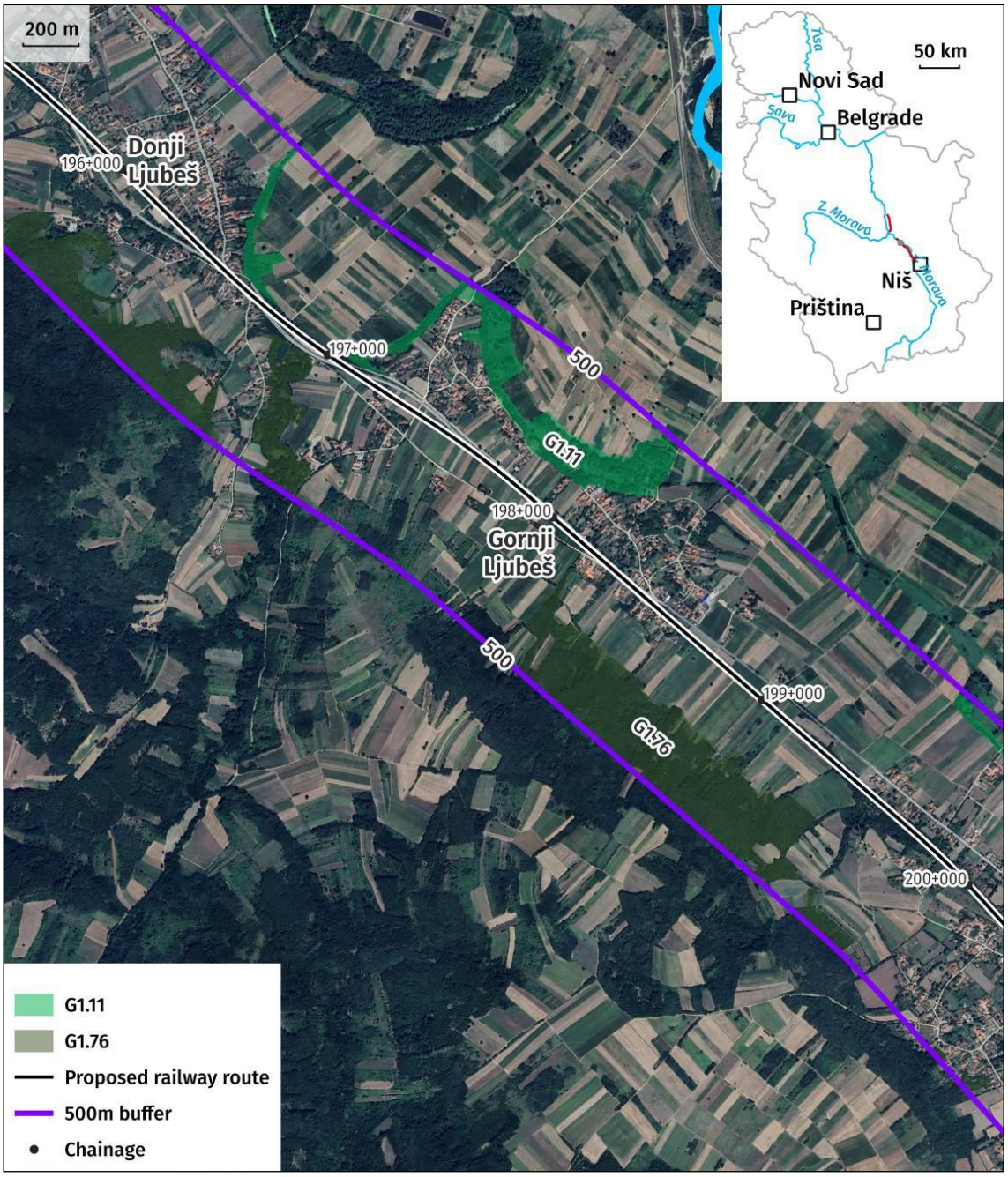

Figure 5-2. Map of the avoidance zones within the Project AoI (segment 2)

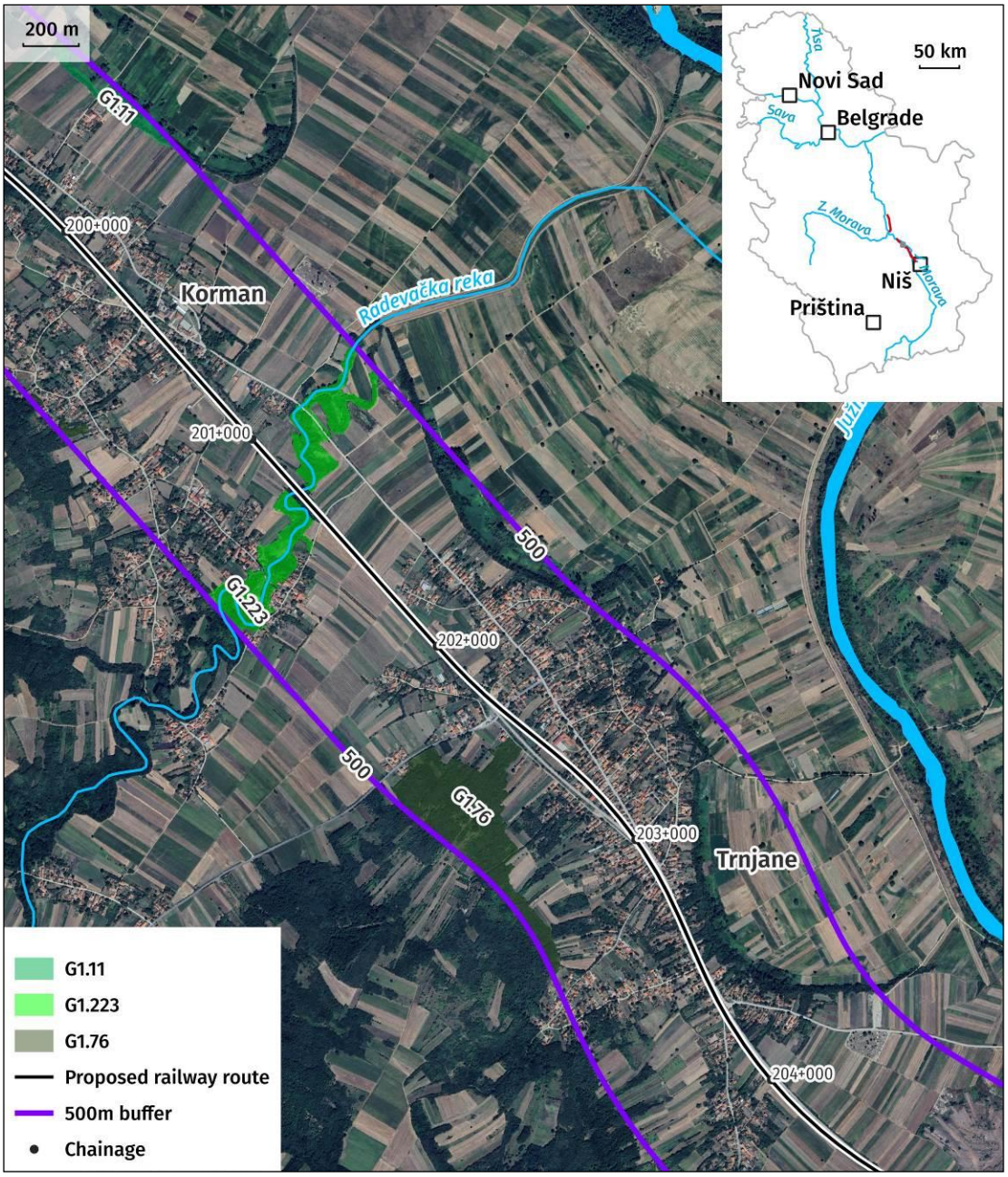

Figure 5-3. Map of the avoidance zones within the Project AoI (segment 3)

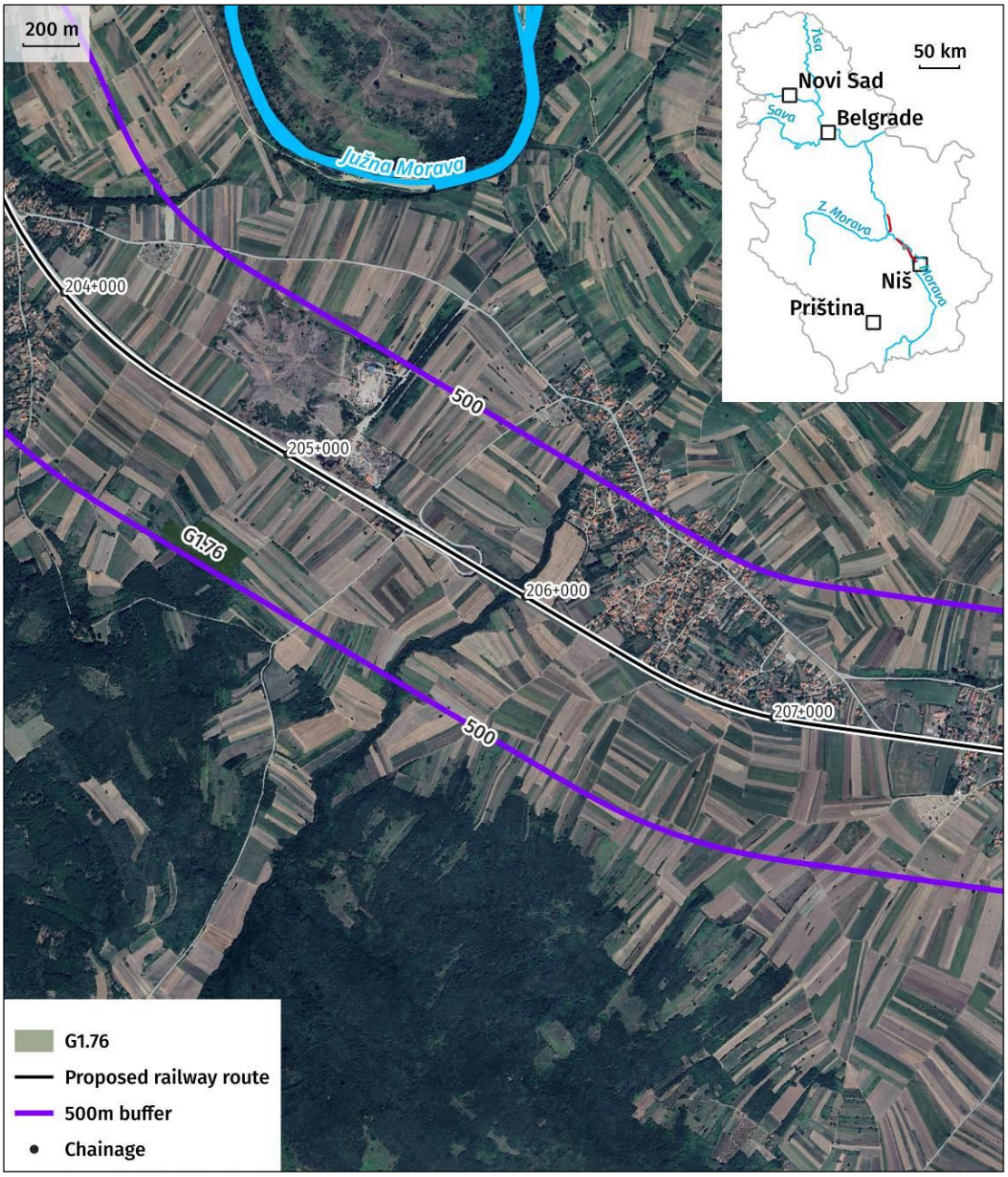

Figure 5-4. Map of the avoidance zones within the Project AoI (segment 4)

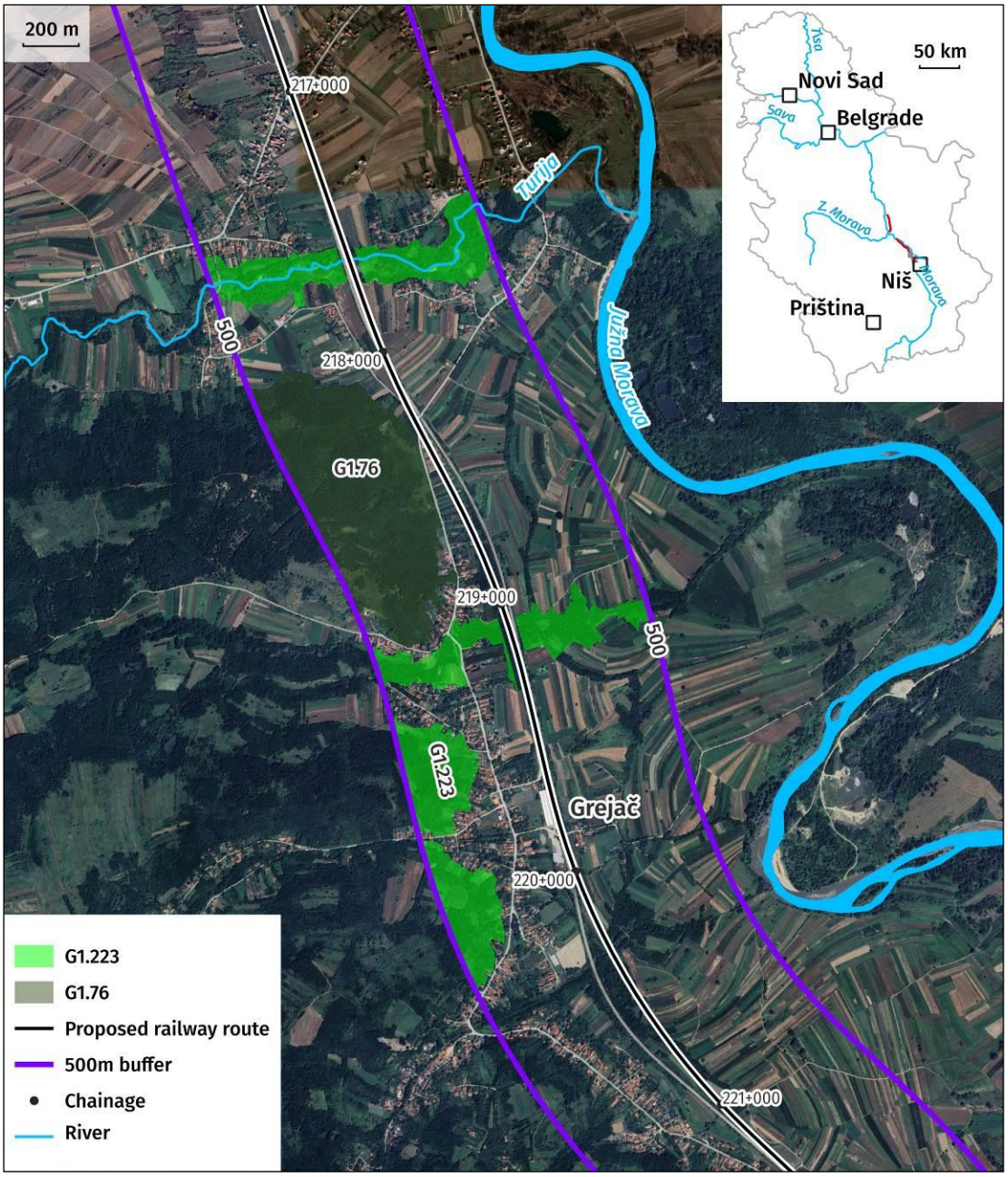

Figure 5-5. Map of the avoidance zones within the Project AoI (segment 5)

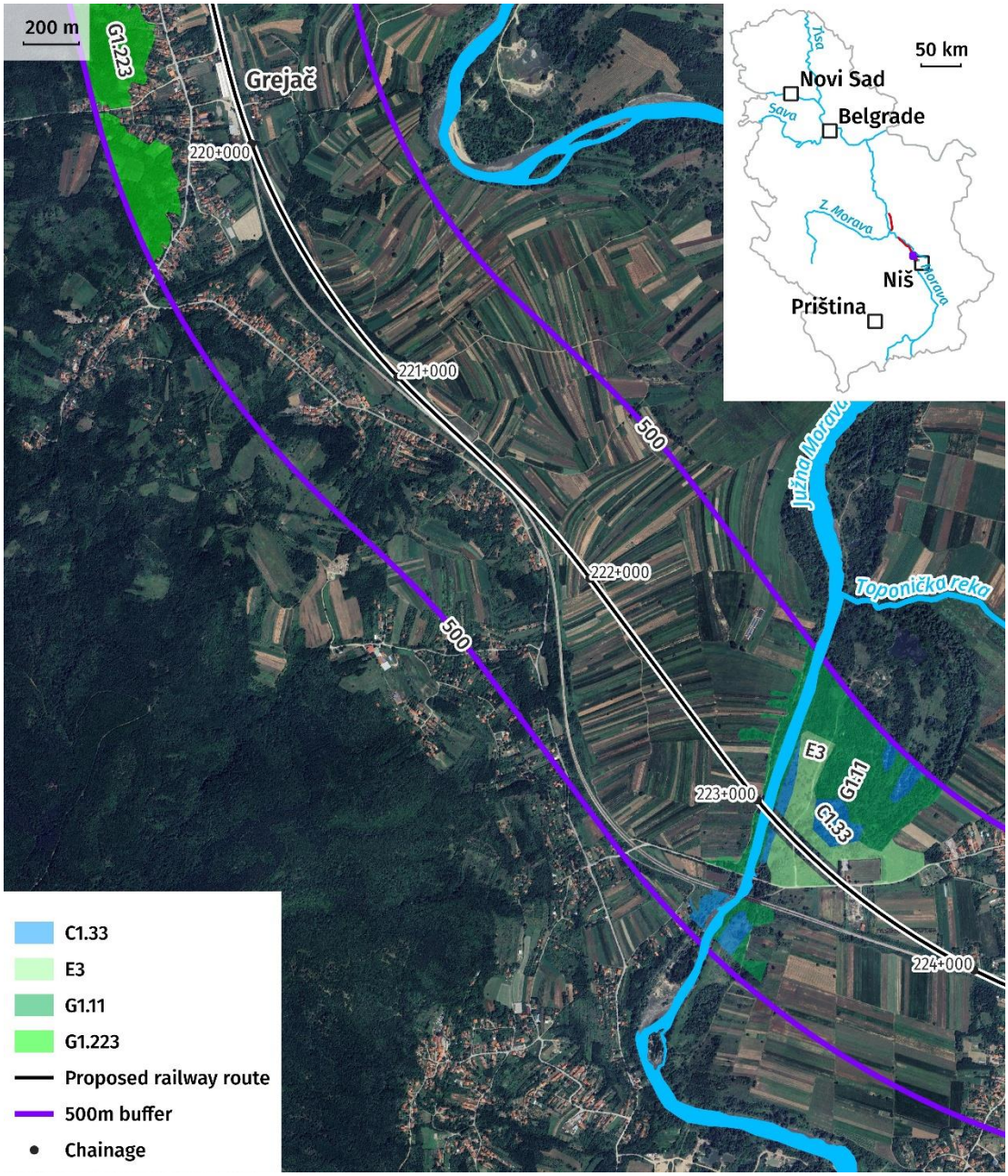

Figure 5-6. Map of the avoidance zones within the Project AoI (segment 6)

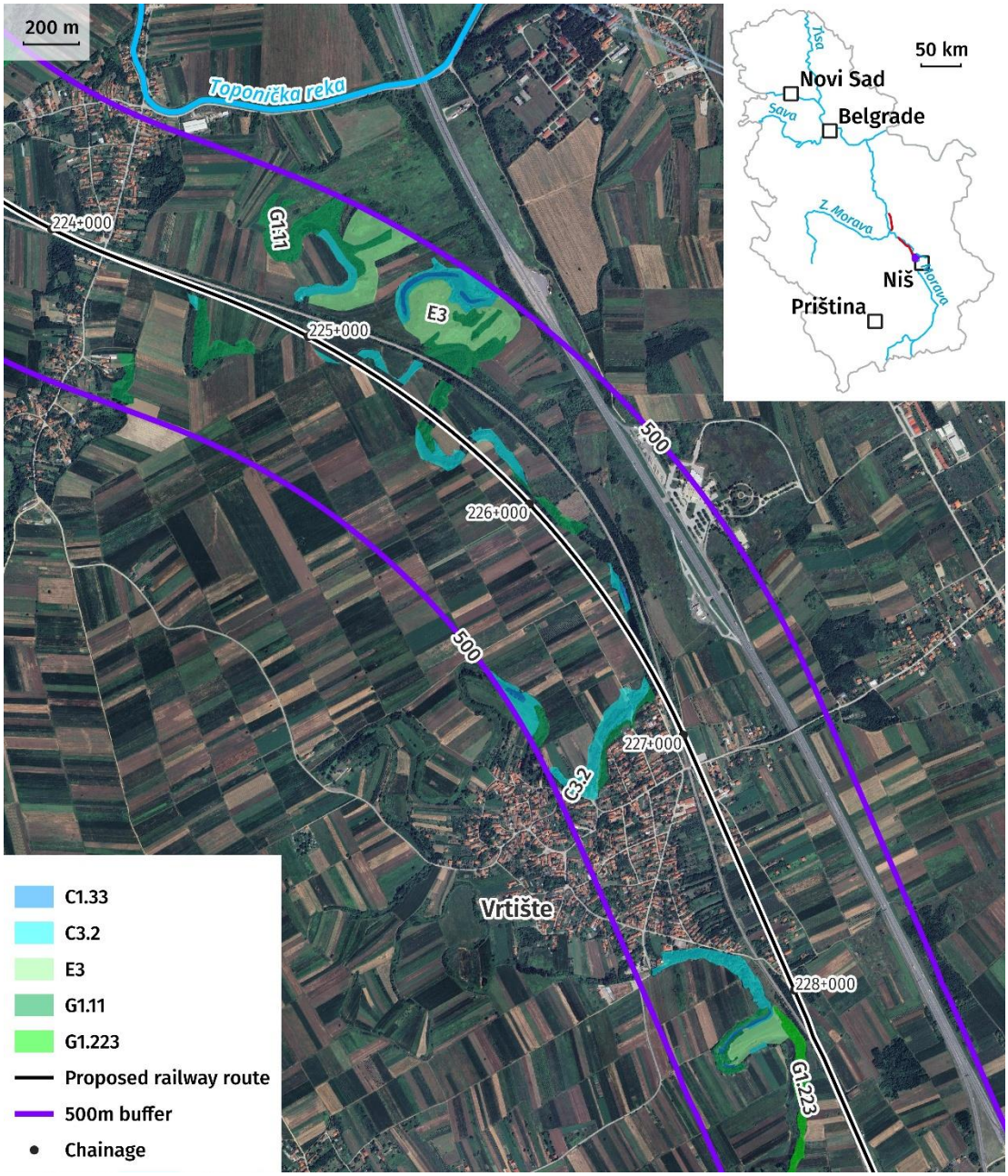

Figure 5-7. Map of the avoidance zones within the Project AoI (segment 7)

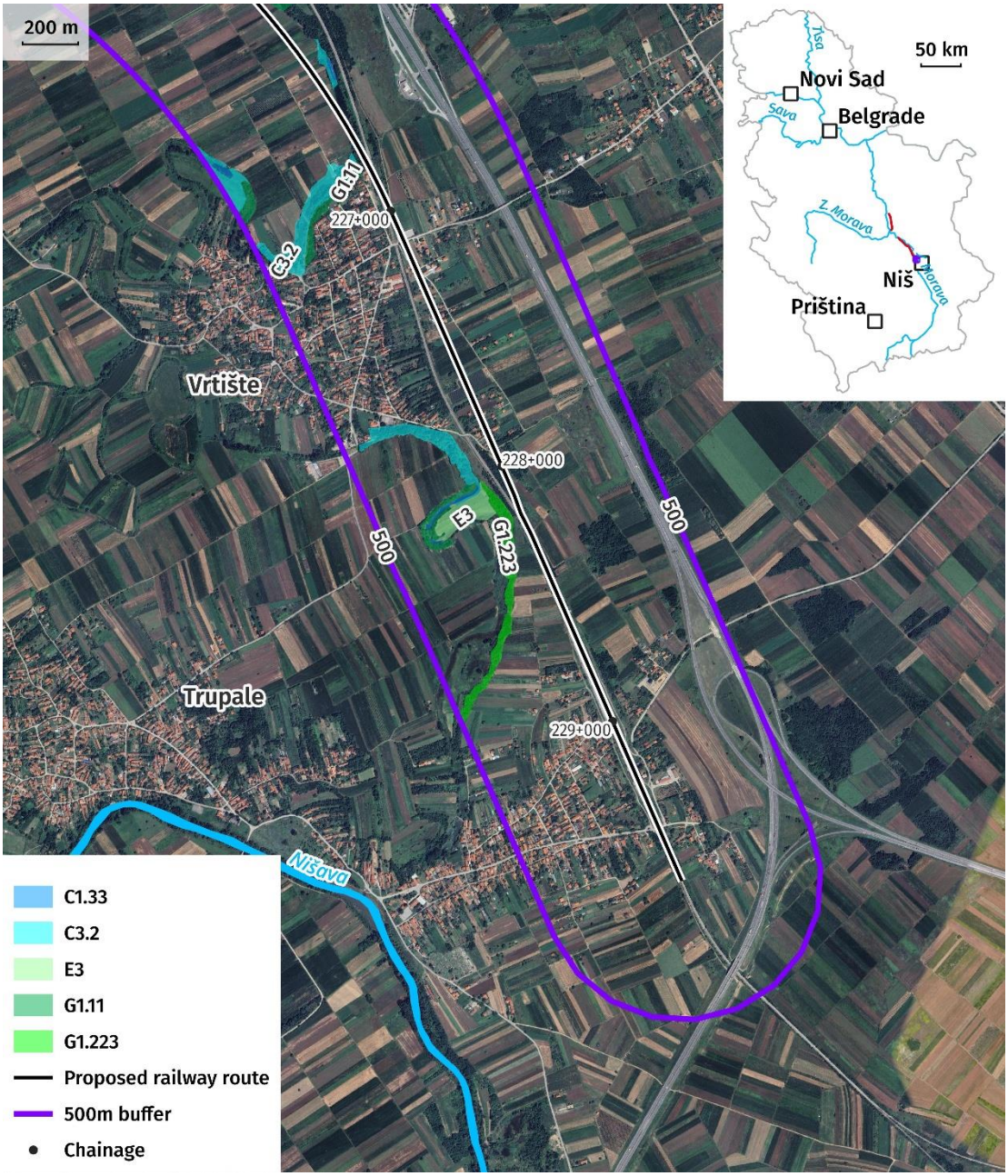

Figure 5-8. Map of the avoidance zones within the Project AoI (segment 8)

- A detailed survey of aquatic habitats in the riparian zone of Južna Morava River must be undertaken to map their exact locations and boundaries; to confirm avoidance of these habitats or facilitate the identification and implementation of additional mitigation measures if they cannot be avoided.
- It is necessary to provide water culverts at chainages 225+170 km, as well as 225+525 km, in order not to change the hydrographic regime of C1.33 and G.11 habitats.

- Ensure the relocation of pond turtles (*Emys orbicularis*) at Vrtiste locality, in the area of new railway corridor alignment from 226+900 km to 228+250 km - Đunis – Trupale subsection. Pond turtles have been recorded in ponds which will be destroyed during construction due to correction of the curve (current ponds at location 43.379980N and 21.805960E). New possible location is proposed in the vicinity of the railway (ponds at location 43.365540N and 21.810460E). This must be done in consultation with a qualified herpetologist familiar with the habitat requirements of the species, and the success of relocation must be closely monitored.
- Select sites for the disposal of construction and waste materials, facilities for workers, parking places and manoeuvring of machinery and fuel depots in a way to avoid destruction or impact on surrounding areas that are out of approved working areas (e.g., areas suitable for CH species of butterflies - *Lycaena dispar, Nymphalis vaualbum, Zerynthia Polyxena, Parnassius mnemosyne, Phengaris arion, Cerambyx cerdo* especially woodland habitats as well as areas along the watercourses including wet meadows).
- Conduct pre-construction surveys of birds in the year scheduled for construction to ensure up-to-date data is collected, given the potential for changes in habitat conditions. Focus will be on the parts of the route that intersect the pSPA "Dobrić-Nišava" (from km 220+315).
- Abutments of the proposed bridges must be designed to retain habitats along the waterways and the associated movement of species.
- The project area is interspersed with small streams and melioration canals which represent movement corridors and are likely to support local migrations. Include the requirement for an amphibian/reptile protection fence to be installed in the length of 50 m before and after every bridge/culvert in the Main Design. This is done to prevent small fauna fatalities caused by amphibians and reptiles entering the RoW.
- A Restoration Plan for the re-establishment of all habitats identified as Priority Biodiversity Features and Critical Habitat has to be developed.
- To provide a connection under the railway at least, and to minimise risk of possible collision to fauna using vehicle under- and overpasses, appropriate structures/crossings for small mammals will be designed. Include in the Main Design of the Project crossing structure for small mammals, amphibians and reptiles based on obtained location conditions from the authorised Institution for Nature Protection of Serbia and following the Rulebook about special technical-technological solutions that enable uninterrupted and secure communication of wild animals (Official Gazette of RS, No. 72/2010). The Rulebook prescribes that crossing for small wild animals (weasels, hedgehogs, otter, badger, fox, rabbit, etc.) can be only underground crossings, round or rectangular, with dimensions adapted to the type of animal for which they are intended. A protective fence must be placed on both sides of the crossing, which prevents animals from accessing the road/railway, whose minimum length is 100-500 m. The minimum dimension values can be 0.6 m or 0.6 x 0.6 m (width x height) up to 2 m or 2 x 1.8 m, in case the length is 15-30 m. When it comes to amphibians and reptiles, the Rulebook prescribes crossings in the form of tunnels with structures that direct the movement of animals, with openings at both ends. The opening of the crossing can be circular, rectangular, or elliptical, and the diameter varies concerning the length of the tunnel, so that the minimum diameter values range from 0.4 to 1.2 m. Structures that direct the movement of animals are placed vertically on the edge of the tunnel, with a minimum height of 50 cm. The proposed structure will be constructed at chainages km 227+000.
- To prevent the electrocution of birds and bats, the detailed design must include the installation of insulator covers and good insulation of conductors on catenary and electrical infrastructure.
- During the planning of the Project timeline and construction works, incorporate seasonal constraints on the timing of construction activities as defined in Section 6 of the BMP into the final construction schedule and work plan.
- Construction of a new bridge over the Južna Morava River at the km 223+054.78 of the right track, with piers in the riverbed, is planned. This activity will cause a potential impact on terrestrial and aquatic trigger species, so following national regulation on nature protection, conditions from the Institute for Nature Conservation need to be issued.

5.2. Construction phase

The mitigation measures that must be implemented during the construction phase are presented in the table below (Table 5-1). While Project activities are ongoing, the ECoW will monitor the site to ensure legislation is followed, to monitor water habitats and related species, to perform wildlife surveys and species translocation, if necessary, as well as to supervise activities such as vegetation clearance.

Table 5-1. Mitigation measures during the construction phase

Feature (Receptor)	Action	Frequency/ Timing	*KPI Notes
General measures	Contractor to engage the Ecological Clerk of Works (ECoW) to provide onsite monitoring and ensure that works will be carried out in accordance with legislation. Prior to commencement of works, ECoW will monitor protected species and areas, and will report if appear any concern regarding biodiversity issues.	Prior to the beginning of construction	ECoW engaged, onsite monitoring and regular reporting conducted.
	ECoW to develop and implement the Invasive Alien Plant Species Management Plan as a part of the Construction Environmental and Social Management Plan to prevent the spread of invasive alien species. The Invasive Alien Plant Species Management Plan must be developed prior to the commencement of construction activities. ECoW to prepare Ecological Chance Finds Procedure. ECoW to prepare the manual and induction training for construction workers and other personnel on important species and habitats and their identification (including no go or avoidance zones), as well and guidelines for their preservation and actions if encountered during their work.	Prepared prior to the beginning of construction, implemented throughout construction phase	Invasive Alien Plant Species Management Plan, Ecological Chance Find Procedure and Induction training manual prepared before start of construction No increase in invasive species coverage compared to baseline conditions
	Implement ecological surveys and a chance finds protocol to avoid impacts on biodiversity during the siting of temporary works and laydown areas.	Continuously during the construction phase	Reports on findings of flora and fauna Findings assessed about PBF/CH criteria
	Incorporate biodiversity seasonal constraints on the timing of construction activities as defined for flora and fauna into the final construction schedule and work plan.	the beginning of construction	Seasonal constraints are incorporated into the final construction schedule and work plan
	When constructing open channels/passages for fauna, it is necessary to preserve the surrounding flora lead the animals naturally towards the passage.	During the construction phase, to continue into operation	Vegetation around the passage was preserved

Feature (Receptor)	Action	Frequency/ Timing	*KPI Notes
Habitats and flora	Project facilities (workers camps, waste dump sites, etc.) must be located outside of EAAAs of PBFs and CHs, G1 and E3 habitat types to prevent any additional loss and degradation. Special attention will be given to the preservation of *91E0 habitats as outlined under avoidance zones, given that no further net loss of this habitat is allowed. These habitats must be avoided during culverting and construction of structures such as bridges, tunnel, viaducts, access roads etc.	Before the beginning of construction	EAAAs of PBFs and CHs must be avoided
	Identify and mark avoidance zones (EAAAs of PBFs and CHs and G1 habitat type) in the vicinity of the construction sites. Avoidance zones must be clearly demarcated with marking flags, rope, biodegradable paint or other clearly visible markings. Ensure avoidance zones are considered in the Management of Change procedures (including for the identification of locations for all temporary construction areas, access roads and supporting facilities). If an avoidance zone cannot be avoided, the need to enter such area and lack of alternatives shall be justified by the Contractor and they shall propose and implement measures to minimise and mitigate impacts and for any potentially significant impacts implement measures to achieve no net less or net gain of the affected habitats and/or species. Entry into all such zones must be pre-approved by the Company (via the Supervision Engineer) as part of the Management of Change procedure.	Prior to the beginning of construction	No impact on avoidance zones.
	Develop a Habitat Restoration Plan for the re-establishment of all habitats in the working corridor, with focus on habitats identified as PBF and CH. Implement natural and aided regeneration of plant species focusing on the area of E3 Wet or seasonally wet grasslands (approx. km 223+000) that will be directly impacted by the new part of the corridor. There is a possibility that revegetation may not be successful, which will be determined through monitoring. Regular control and monitoring activities will be undertaken. Comparison of these sites with sites where aided regeneration has been implemented will help evaluate restoration outcomes and determine if further intervention is necessary.	Plan developed prior to beginning of construction activities and implemented during construction and operation phases	Habitat Restoration Plan developed prior to start of construction and updated during construction phase All habitats within the working corridor restored to initial state (at a minimum)

Feature (Receptor)	Action	Frequency/ Timing	*KPI Notes
	In order to successfully carry out restoration and avoid possible overgrowth of disturbed habitats with invasive plant species, it is necessary to carry out the appropriate procedure: • Collect seeds from native E3 habitats that will be degraded during the construction phase. Seeds have to be collected before the beginning of construction activities from immediately adjacent habitat, preserved and stored appropriately based on advice of the ECoW. To ensure flora diversity, the seeds have to be collected from as many native growing plants as possible. Equal amounts of seed from each plant will be mixed together before planting. • Alternatively, where feasible, seeds may be collected from adjacent, undisturbed areas of target habitats at the time of restoration, in order to reduce long-term storage and handling risks. • Equal amounts of seed from each species will be mixed before sowing to avoid dominance of any single species. • Topsoil (top, fertile layer of the land surface that is capable of supporting plant growth) within these habitats has to be stripped before the beginning of construction activities. Topsoil will be used for restoration, as it contains the seed bank and is therefore an essential component of the revegetation plan. Topsoil must be stored separately from subsoil and in safe places to avoid its mixing with different soils and/or propagules of non-native plant species. Topsoil must be stored in piles no more than 2 m high and slopes less than 45 degrees with suitable erosion control measures implemented. • Implement the Invasive Alien Plant Species Management Plan if it is necessary, within the habitats where the restoration is to be implemented, immediately after completing the construction activity on these habitats. • Upon completion of construction, return topsoil that was removed and stored before the beginning of the construction activities and monitor revegetation. • If necessary, plant collected seeds for aided restoration.		

Feature (Receptor)	Action	Frequency/ Timing	*KPI Notes
	Implement in situ habitat revegetation of degraded forest habitat (marked as CH/PBFs) directly impacted by the Project with native deciduous trees, as much as possible: • 91E0* at chainages cca 193+000 km, cca 196+800 km, cca 223+000 km and between 225+000 and 226+000 km. • 91F0 at chainages: cca 201+500 km, 217+500 km and cca 219+100 km • 91M0 at chainages: cca 192+000 km, cca 193+000 km, cca 195+000 km, cca 202+200 km and cca 218+000 km. Afforestation will be carried out with autochthonous species in coordination with the Public Enterprise "Srbijašume" which will appoint the appropriate afforestation areas in the wider Project area. Regular control and monitoring activities will be undertaken in line with Chapter 7. Monitoring		
	The clearance/removal of vegetation must be limited to the working corridor and done only where necessary.	Before the beginning of construction and during the entire construction phase	Clearing/removing vegetation limited to the working corridor
	Implement offset measures for 91E0* Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae*), 91F0 Riparian mixed forests of *Quercus robur, Ulmus laevis and Ulmus minor, Fraxinus excelsior or Fraxinus angustifolia* and 91M0 Pannonian-Balkanic turkey oak – sessile oak forests. Implement offset measures for 91E0* Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae*) through active management practices on a surface no less than 2.39 ha. Implement offset measures for 91F0 Riparian mixed forests of *Quercus robur, Ulmus laevis and Ulmus minor, Fraxinus excelsior or Fraxinus angustifolia* through active management practices on a surface no less than 2.59 ha. Implement offset measures for 91F0 91M0 Pannonian-Balkanic turkey oak – sessile oak forests through active management practices on a surface no less than 9.03 ha.	Near the end of the construction and during operation phase	Presence and cover in % of positive indicator species (e.g. *Alopecurus pratensis, Arrhenatherum elatius, Centaurea jacea, Knautia arvensis*) Consultations held with Public Enterprise "Srbijašume". Survival rate of planted trees of at least 30 % Restored and enlarged surface area of native habitats

Feature (Receptor)	Action	Frequency/ Timing	*KPI Notes
	First a location of the offset is to be selected. It must be an analogous habitat in a Project-adjacent area covering at least mentioned areas for each habitat. By targeting such areas with concrete actions, the aim is to raise the habitat quality to "good" with "medium" distinctiveness (as per Traweek et al., 2010). To compensate habitat loss, afforestation has to be carried out with autochthonous species: • *Salix alba* and *Populus alba* (for 91E0* Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae*) • *Quercus robur* and *Fraxinus angustifolia* (for 91F0 Riparian mixed forests of *Quercus robur, Ulmus laevis and Ulmus minor, Fraxinus excelsior or Fraxinus angustifolia*) • *Quercus frainetto and Quercus cerris* (for 91F0 91M0 Pannonian-Balkanic turkey oak – sessile oak) Afforestation has to be carried out by planting with seedlings seeds and seedlings harvested locally from the same forests. Afforestation will be carried out with autochthonous species in coordination with the Public Enterprise "Srbijašume" which will appoint the appropriate afforestation areas in the wider Project area. Regular control and monitoring activities will be undertaken in line with Chapter 7. Monitoring ECoW to prepare 91E0*, 91F0 and 91M0 habitat management guidelines and establish management that is to be provided to SRI to continue management into the operation phase.		
	Implement revegetation of the old part of the railway corridor with native deciduous tree species. By construction of the new part of the railway corridor railway will be moved from native forest habitats: G1.11 habitat (from 192+050 km to 193+200 km, from 196+600 km to 197+100 km, from 197+100 km to 197+800 km, from 221+450 km to 224+100 km, from 224+100 km to 226+900 km and from 226+900 km to 228+250 km), G1.223 habitat (from 217+150km to 218+050 km , from 218+050 km to 219+250 km), G1.76 habitat (from 192+050 km to 193+200 km, from	Near the end of the construction and during operation phase	Survival rate of planted trees of at least 30 %

Feature (Receptor)	Action	Frequency/ Timing	*KPI Notes
	194+050 km to 194+900 km, from 194+900 km to 195+700 km, from 196+600 km to 197+100 km, from 202+200 km to 203+050 km, from 218+050 km to 219+250 km)		
	Implement natural and aided regeneration of C3.2 Water-fringing reedbeds and tall helophytes other than canes at chainages between 225+000 km and 226+000 km through maintaining or restoring water levels and preventing spread of invasive plant species. *Typha* sp. are dominant species within this habitat. Within degraded habitats, *Typha* sp. populations may respond by spreading vegetatively at a rapid rate. Regular monitoring of this habitat will be carried out during construction. Maintaining and restoring of water levels will be done through designing culverts or small retention areas. Shallow depressions must be designed so as to retain water during seasonal high-flow periods, aiming for a depth of 30 to 50 cm. Where natural regeneration is unlikely due to soil compaction or hydrological disruption, plant species such as *Typha latifolia*, *Schoenoplectus lacustris*, or *Iris pseudacorus*.	During the construction	Revegetated of 0.60 ha habitat
	Preserve of 3150 Natural eutrophic lakes with *Magnopotamion* or *Hydrocharition* -type vegetation within the buffer zone at cca 223+100 km. This habitat has to be marked and fenced off to protect it. This habitat is located in the working corridor at the site where the bridge is planned to be built. When the bridge is built, this habitat will be under the bridge. Before the bridge construction begins, this habitat must be marked and fenced off in order to protect it.	At the beginning of the construction	Preserved habitat
	Work on the ecological improvement of the existing anthropogenically impacted rail corridor by using native plants in landscape design.	Near the end of the construction and during the operation phase	Landscape design aligned with biodiversity conservation goals Only native species are used in landscaping areas
	Continuous supervision during construction works by ECoW is required to prevent unnecessary movement of vehicles outside of the area designated for the implementation of construction activities to preserve surrounding habitats. ECoW to demarcate places for parking and turning of construction machinery during the construction and extension of tracks to avoid additional degradation of soil.	During the entire construction phase	Visible delimitation of the areas with restricted access to machinery

Feature (Receptor)	Action	Frequency/ Timing	*KPI Notes
	Maximise the use of existing access roads to avoid the construction of new temporary ones for bringing material and vehicles, which will minimise loss and fragmentation of vegetation, natural and semi-natural habitats.		
	Provide water culverts at chainages approx. 225+170 km, as well as approx. 225+525 km, in order not to change the hydrographic regime of C1.33 and G.11 habitats.	During construction	Water culverts constructed
	Ecological improvement of the existing anthropogenically impacted old part of the rail corridor at chainages where the straightening curves are foreseen (between 194+050 km and 194+900 km, between 226+900 km and 228+250 km)	Near the end of the construction	Ecologically improved area (i.e. habitats restored mainly with native plants, inhabited by different animal species. Also, these areas represent a barrier to the spread of invasive plant species)
	Prevent unnecessary movement of vehicles outside the area designated for construction activities to preserve surrounding habitats. The movements of heavy machinery need to be restricted to the existing road network, to minimize the degradation of the natural habitats	Before the beginning of construction and during the entire construction	Visible delimitation of the areas
	Spraying and wetting of the temporary traffic lanes to prevent the generation of dust and sedimentation of dust on nearby vegetation	During dry periods	Record of dust suppression measures
Insects	Avoid the destruction of habitats of species of national or international conservation concern, e.g. *Zerynthia polyxena, Nymphalis vaualbum* and *Lycaena dispar*. (91M0 Pannonian-Balkanic turkey oak – sessile oak forests, 91F0 Riparian mixed forests of *Quercus robur, Ulmus laevis and Ulmus minor, Fraxinus excelsior* or *Fraxinus angustifolia*, along the great rivers (*Ulmenion minoris*) The map with the position of such habitats (Maps of the avoidance zones within the Project area, Figure Figure 5-1-Figure 5-8) must be provided to all people working on the Project as part of their induction training including all sub-contractors. Avoid unnecessary cutting of trees and removal of dead wood, particularly oak, from habitats as they are important for saproxylic species, including *Lucanus cervus* that occur in the wider area. Implement ecological survey and chance finds protocol for insect species avoidance in the siting of temporary	During construction phase	Support facilities located outside the area of EAAAs of PBFs and CHs and E3 habitats Supervision reports with no evidence of destruction of habitats of species of national or international conservation concern Report after the Ecological survey. Report of the implementation of the chance find protocol

Feature (Receptor)	Action	Frequency/ Timing	*KPI Notes
	works and laydown areas (CH species of butterflies - *Lycaena dispar, Nymphalis vaualbum, Zerynthia Polyxena, Parnassius mnemosyne, Phengaris arion Cerambyx cerdo*)		
Macroinvertebrates	Minimise the riverbed's destruction as much as possible during construction of a new bridge over the river Južna Morava, designed at the km 223+054.78 of the right track, with piers in the riverbed. This can protect *Theodoxus transversalis* and *Unio crassus*, sedentary species of conservation interest, and highly sensitive due to their sedentary life. Install sediment barriers such as silt curtains or sediment traps downstream of the construction site to prevent excessive turbidity and sediment deposition, which can smother benthic habitats and negatively affect macroinvertebrate communities. Ensure all machinery is well-maintained to prevent leaks of oil, fuel, and other harmful substances. Implement measures to control runoff and filter pollutants before they reach water bodies, such as buffer strips, swales, and constructed wetlands. Implement actions to control drainage to prevent the negative impacts on aquatic ecosystems during design development. Reduce the discharge of all contaminated effluents into water to preserve macroinvertebrates. Use biodegradable, non-toxic construction materials and chemicals to minimize potential water contamination. Avoid the removal of trees along river banks to preserve the hydrological regime, the diversity of habitats, water temperature and the prevention of erosion of the banks.	During the construction phase	No pollution incidents reaching surface waters Supervision reports with no evidence of destruction of riparian habitats.
Fish	The construction of bridges and other construction works near water courses is to be carried out during the dry season (during the summer period) and confirmed by regular monitoring of official data on the current status of the hydrological regime. Minimise the riverbed's destruction as much as possible during construction of a new bridge over the river Južna Morava designed at the km 223+054.78 of the right track, with piers in the riverbed. Avoid using heavy machinery in the riverbed or changing the watercourses of the following rivers: Rača, Velika Morava, Osanica, Lugomir, Belica rivers. Through this,	During construction phase	No pollution incidents reaching surface waters Regular monitoring reports of ichtyofauna Ensured natural fish pass during construction of bridge with pillars in the water.

Feature (Receptor)	Action	Frequency/ Timing	*KPI Notes
	species of fish of conservation importance remain protected: *Cobitis elongata* (PBF) *Cobitis teaenia* (PBF) *Cottus gobio* (PBF) *Barbus meridionalis* (PBF) *Barbus balcanicus* (PBF) *Leuciscus aspius* (PBF) *Rhodeus amarus* (PBF) *Romanogobio albipinnatus* (PBF) *Romanogobio kesslerii* (CH) *Romanogobio uranoscopus* (PBF) *Zingel zingel* (PBF) *Zingel streber* (PBF) Ensure all machinery is well-maintained to prevent leaks of oil, fuel, and other harmful substances. Implement measures to control runoff and filter pollutants before they reach water bodies, such as buffer strips, swales, and constructed wetlands. The construction of bridges and other construction works in watercourses are to be carried out during the dry season (during the summer period) and confirmed by regular monitoring of official data on hydrological regime status. Special attention is to be paid during the construction of a bridge with piers in the water, at km 223+053 on Južna Morava River. Ensure natural fish pass during the construction of the bridge. Install silt curtains around active in-stream construction zones to minimise sediment dispersion and turbidity. This measure is critical to protect fish gill function, maintain visual feeding and navigation, and prevent the smothering of fish eggs and spawning habitats. Ensure curtains are properly anchored and monitored for effectiveness throughout construction activities. Implement actions to control drainage to prevent the negative impacts on aquatic ecosystems during design development. Reduce the discharge of all contaminated effluents in water, to preserve fishes. Use biodegradable, non-toxic construction materials and chemicals to minimize potential water contamination. Avoid construction works near the river flows in the periods when the disturbance of fish species will be the most intensive: the spring season (e.g. April and May) to ensure that potential influence on spawning is diminished.		

Feature (Receptor)	Action	Frequency/ Timing	*KPI Notes
	Avoid using lighting during construction and if not in use, will be switched off, where possible. Avoid the position of light so as not to spill neither far into the air, nor onto watercourses.		
Amphibians	Where fencing is required for safety and security reasons, ensure that the construction sites are fenced with a 2m-high fence (diameter of mesh will be 2 cm or less) along the route. ECoW to survey trenches and excavations for amphibians, and make sure these have exit ramps/wooden ladders to allow them to escape. Avoid vegetation clearance and major construction work near watercourses during the breeding season for amphibians (April to June).	Construction phase Spring season throughout construction phase	Regular monitoring reports No amphibian mortality as a result of negligence
Reptiles	During the construction period, the working area will be managed so that it does not provide suitable habitats for reptiles (shelter and hibernation). This includes avoiding the stockpiling of excavation and other material, which could provide reptiles with hiding and basking opportunities. ECoW to survey trenches and excavations for reptiles, and make sure these have exit ramps/wooden ladders to allow them to escape. Prevent/avoid vegetation clearance and major construction works during the breeding season for reptiles (April to June). Implement ecological surveys and a chance finds protocol to avoid impacts on reptile species during the siting of temporary works and laydown areas.	During the construction phase	Regular monitoring reports No reptile mortality as a result of negligence
Birds	All vegetation clearance will be undertaken outside of the bird nesting period. Pre-clearance surveys are to be done by the ECoW in order to assess high-sensitivity zones for birds, checking for nesting, breeding or overwintering birds. Construction is to be avoided in the vicinity of these zones to avoid disturbances in the following periods: 1. Wintering bird period (between December and February), 2. Nesting period of birds (between March and July/August). As this may not be practicable, to comply with the EU Birds Directive, if vegetation clearance is to take place during the bird nesting season, then an expert ecologist will first survey the target vegetation for nesting birds. If breeding birds or wintering birds are found, no work will be performed within 50 m of the	From March to July/August During the construction phase	Regular monitoring reports No disturbed bird nests

Feature (Receptor)	Action	Frequency/ Timing	*KPI Notes
	nest. Only vegetation not needed for nesting birds can be removed. Works within the protective buffer must be rescheduled until after the young birds have successfully fledged (or breeding has failed). If bird nests require relocation, ECoW must inform SRI and contact the Institute for Nature Conservation to obtain expert opinion and conditions. Do not keep the construction site fully lit during the night and ensure all lighting has daylight sensing to turn it off and on. Position lighting to prevent upward light spill and avoid illumination of watercourses. According to EU practice, one of the key factors for reducing collisions with trains and lines is the height of the surrounding vegetation. In the case when the vegetation is higher than the upper structure of the railway (electrical lines and poles), a natural barrier is created that the birds fly over and thus avoid the area of train traffic. Targeted planting of native tree species along defined sections of the railway route shall be implemented as a natural mitigation barrier to reduce the risk of collisions and electrocution for birds and bats. This will discourage low-altitude flight paths across the railway for bird species defined under the operation phase. It is recommended to undertake planting with native, autochthonous species, where feasible, near pre-existing forest fragments to ensure habitat connectivity and near potential movement corridors (i.e. clearings leading to water bodies), where activity of these species is increased. This will additionally be aided by the creation of avoidance zones for critical habitats, as defined above.		
Mammals	ECoW to observe trenches, excavations for mammals, during site walkovers and make sure exit ramps/wooden ladders are present to allow trapped fauna to escape. All surplus material that will not be used in the construction work must be stored at predefined locations, where the environmental impact will be assessed. Construction waste must be systematically discharged of and transported to prevent fatalities of fauna. Follow the Waste Management Plan and Construction Management Plan in order to adequately manage	During construction phase	Regular monitoring reports Supervision reports

Feature (Receptor)	Action	Frequency/ Timing	*KPI Notes
	inorganic waste that could trigger possible injuries and organic waste, which may attract wildlife and pose a risk of disease transmission. Avoid the removal of trees along riverbanks to preserve the hydrological regime, diversity of habitats, water temperature and to prevent erosion of the banks. Avoid any impact to riparian vegetation, especially due to the potential presence of the Eurasian otter. Avoid using lighting during construction and if not in use, ensure all lighting has daylight sensing to turn it off and on, where possible. Position lighting to prevent upward light spill and avoid illumination of watercourses. As mentioned under the previous section, planting of tree species to discourage low-altitude flight near the railway is to be implemented to avoid collision risks for bats as well. Avoid dawn-dusk and night-time works, during the activity of nocturnal animals such as carnivorous species and bats.		
Protected areas	Avoid any activities that might reduce ecological integrity in pSPA/IBA Dobrić-Nišava, crossed by the existing railway at 220+315 km If any activity threatens biodiversity, the responsible authority must be informed and the activity must stop until the exact situation is assessed and new measures are prescribed.	During construction phase	Monitoring reports after periodic field surveys
	Implement ecological survey and chance finds protocol including habitat and species avoidance during the siting of temporary works and laydown areas in any protected area	Before the beginning of construction	Implemented Chance finds the protocol

* KPI – Key Performance Indicator, in this case, the level at which additional or targeted mitigation would be required

5.3. Operation phase

The mitigation measures that must be implemented during the operation phase are presented in the table below (Table 5-2**Error! Reference source not found.**).

Table 5-2. Mitigation measures during the operation phase

Feature (Receptor)	Action	Frequency/ Timing	*KPI Notes
Habitats and proliferation of Invasive Plant Species	Develop the Invasive Species Management Plan as a part of the Operational Environmental and Social Management plan and implement it for all invasive plant species, with regular monitoring performed two times per year along the entire corridor in order to	During the entire operation phase, every month from March to October	No spread of invasive plant species Preserved habitat

Feature (Receptor)	Action	Frequency/ Timing	*KPI Notes
	prevent their further spread. Ensure mechanical removal methods are used in preference to any herbicides. Monitoring of natural and aided restoration of E3 Wet or seasonally wet grasslands (approx. km 223+000) and C3.2 Water-fringing reedbeds and tall helophytes other than canes (between 225+000 km and 226+000 km). Monitoring of conservation of 3150 Natural eutrophic lakes with *Magnopotamion* or *Hydrocharition* -type vegetation Monitoring of restoration of 91E0* Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae*), 91F0 Riparian mixed forests of *Quercus robur, Ulmus laevis* and *Ulmus minor, Fraxinus excelsior* or *Fraxinus angustifolia*, along the great rivers (*Ulmenion minoris*) and 91M0 Pannonian-Balkanic turkey oak – sessile oak forests		Restored habitats
Macroinvertebrates and fishes	Avoid the use of chemicals near rivers Avoid runoff of pollutants such as oils, lubricants, and heavy metals from railway tracks into water bodies. Ensure effective drainage systems are installed in addition to the sediment traps and filtration systems to reduce sedimentation and nutrient loading in nearby water bodies. In case an accident is reported, immediate action is needed in cooperation with environmental inspection and procedures The company is responsible for implementing regular monitoring of macroinvertebrates (*Unio crassus, Theodoxus transversalis*) and fishes (*Cobitis elongata, Cobitis teaenia, Cottus gobio, Barbus meridionalis, Barbus balcanicus, Leuciscus aspius, Rhodeus amarus, Romanogobio albipinnatus, Romanogobio kesslerii, Romanogobio uranoscopus, Zingel zingel, Zingel streber, Cyprinus carpio)* of concern and using adequate measures if regular reports indicate any negative impact on them. This means that annual monitoring of target macroinvertebrates and fishes, utilizing standardized biomonitoring protocols, will be conducted over the next five years to ensure the maintenance of the same or improved ecological status. In the event of ecological deterioration, the Company will inform relevant authorities (e.g. Institute for Nature Conservation or Ministry of the Environment) and propose appropriate mitigation measures.	During the entire operation phase	Regular Monitoring Report No pollution events

Feature (Receptor)	Action	Frequency/ Timing	*KPI Notes
Amphibians	Company to ensure annual maintenance of passages for small fauna and herpetofauna protective fences near bridges/culverts.	During the entire operation phase, every year	Passages cleaned Reports on herpetofauna casualties BMP updated with additional measures if fatality hotspots are identified
Reptiles	Undertake regular maintenance of fences along the railway route to reduce wildlife-train collision (WTC). As part of the regular visual observations, the Company is to undertake an inspection of potential damage to the fence. All damages to the fence are to be promptly repaired In case the number of run-over individuals is high and frequent, it is necessary to undertake additional measures (e.g. to set the live traps for individuals to move them to another suitable habitat safely and acceptably, and/or install the denser safety fence in hotspots). Proposed bridges/passes for reptiles will be checked annually to ensure that there are no blockages and maintained for the lifetime of the railway, to ensure there would be no collision of these species during the operation phase. Putting a dense net in the lower part of the fence will prevent the passage of reptiles to the railway lines, in the vicinity of localities Donje Medjurovo, Vrtiste and Mezgraja (cca 223+00 km, cca 225+000 km, between 225+000 km and 226+000 km, cca 227+000 km and cca 228+000 km)	During the entire operation phase, every year	Fence damages repaired within three months Reports on herpetofauna casualties BMP updated with additional measures if fatality hotspots are identified
Birds	Avoid the position of light to spill neither far into the air, nor onto watercourses. The success of tree planting implemented nearing the end of the construction phase shall be regularly monitored to evaluate the effectiveness in minimising bird collision and electrocution risks. This includes assessments of vegetation growth, canopy development, and whether the planted vegetation successfully guides bird flight paths away from overhead lines and other hazardous infrastructure. An immediate monitoring program during operation is necessary to establish during the first year, every month, to assess new situations concerning WTC for birds. Cooperation between the Institute for Nature Conservation and the Company is obligatory, following	During the entire operation phase, every year	Reports on performed monitoring Records of bird fatalities BMP updated with additional corrective measures if collision hotspots are identified

<table>
<tr><th>Feature (Receptor)</th><th>Action</th><th>Frequency/ Timing</th><th>*KPI Notes</th></tr>
<tr><td></td><td>national regulations, in case of increased bird mortality caused by collision. A list of birds of interest with their flight heights is provided, based on field survey:
<table>
<tr><th>English name</th><th>Latin name</th><th>Flight height (m)</th></tr>
<tr><td>Western marsh harrier</td><td>Circus aeruginosus</td><td>0-400</td></tr>
<tr><td>Great White Egret</td><td>Ardea alba</td><td>0-200</td></tr>
<tr><td>Purple heron</td><td>Ardea purpurea</td><td>0-200</td></tr>
<tr><td>Black kite</td><td>Milvus migrans</td><td>0-800</td></tr>
<tr><td>European Turtle-dove</td><td>Streptopelia turtur</td><td>0-150</td></tr>
<tr><td>White Stork</td><td>Ciconia Ciconia</td><td>0-400 (0-150)</td></tr>
<tr><td>Black stork</td><td>Ciconia nigra</td><td>0-400</td></tr>
<tr><td>Ortolan</td><td>Emberiza hortulana</td><td>0-50</td></tr>
<tr><td>Syrian Woodpecker</td><td>Dendrocopos syriacus</td><td>0-100</td></tr>
<tr><td>Black Woodpecker</td><td>Dryocopus martius</td><td>0-100</td></tr>
<tr><td>Middle spotted woodpecker</td><td>Leiopicus medius</td><td>0-100</td></tr>
<tr><td>Wood Sandpiper</td><td>Tringa glareola</td><td>0-150 (0-30)</td></tr>
<tr><td>Common Kingfisher</td><td>Alcedo atthis</td><td>0-100</td></tr>
<tr><td>Cetti's warbler</td><td>Cettia cetti</td><td>0-50</td></tr>
<tr><td>Common tern</td><td>Sterna hirundo</td><td>0-100 (1-50)</td></tr>
<tr><td>Red-backed shrike</td><td>Lanius collurio</td><td>0-300</td></tr>
<tr><td>Lesser Grey Shrike</td><td>Lanius minor</td><td>0-300</td></tr>
<tr><td>Black-crowned Night Heron</td><td>Nycticorax nycticorax</td><td>0-100</td></tr>
<tr><td>Grey Partridge</td><td>Perdix perdix</td><td>0-100</td></tr>
</table></td><td></td><td></td></tr>
<tr><td>Mammals</td><td>As part of the regular visual inspections, Company to undertake inspection of potential damage to the fence. If damages are notes, undertake regular maintenance of fence along the railway route to reduce wildlife-train collision.
Proposed bridges/passes for small mammals shall be checked annually to ensure that there are no blockages and are to be maintained for the lifetime of the railway.
In case the number of run-over individuals is high and frequent, it is necessary to undertake additional measures (e.g. to set the live traps for individuals, relocate the individuals to another suitable habitat safely and acceptably
Regular monitoring of an increase in bat mortality due to WTC to be conducted during the active periods for bats within the first year. If an increase in casualties is documented, adaptive management of provisioned mitigation measures (particularly, fence construction) will be implemented. In addition, regular monitoring of success of afforestation in reducing the risk of collision for bats is to be implemented.</td><td>During the entire operation phase</td><td>Reports on performed monitoring

Records of bird fatalities

BMP updated with additional corrective measures if collision hotspots are identified</td></tr>
</table>

Feature (Receptor)	Action	Frequency/ Timing	*KPI Notes
	Implement regular monitoring of biodiversity and use adequate measures if regular reports indicate any negative impact on biodiversity		

5.4. Decommission phase

A biodiversity management plan for the decommissioning phase will be prepared in line with DEMP at the end of life for approval and will include controls as outlined in the CEMP.

6. IMPLEMENTATION OF BIODIVERSITY MANAGEMENT PLAN

6.1. Work Schedule

Technical documentation is yet to be finalized, as the Project Design has not been finalised. No detailed work schedule can be outlined within the BMP, and this section of the document will be updated based on relevant information in the construction schedule.

Prior to construction, a schedule will be produced that details all the required biodiversity mitigation measures for each Project implementation phase.

6.2. Review and Revision of the Biodiversity Management Plan

As the Project area is exposed to strong anthropogenic influences, changes in current conditions are possible. Because of that, the regular review and revision of this Management Plan is recommended to identify any areas that need to be adjusted or improved. Therefore, BMP will be reviewed on an annual basis and, notwithstanding this, prior to finalization of the design, before the commencement of construction (upon completion of any pre-construction surveys) and whenever new findings that could impact the contents of the BMP become available. The revision process will be performed by the Contractor's Representative(s) – qualified biologists and/or ecologists during pre-construction, construction, and until the end of the Contract Warranty Period.

Any proposed amendments or revisions shall be provided to EBRD and EIB.

7. MONITORING

Monitoring activities will be split into construction and operational monitoring. The monitoring activities aim to verify whether residual impacts are as expected, and whether the mitigation measures/actions are being implemented and are effective.

7.1. Construction phase

The monitoring activities that have to be implemented during the construction phase are presented in Table 7-1 below.

Table 7-1. Monitoring activities during the construction phase

Monitoring activities	Description	Frequency /Timing	KPI	Responsibility
Habitats and Flora				
Habitats monitoring	Natural habitats adjacent to construction sites shall be regularly monitored for the presence of avoidable and unintentional disturbance, such as habitat loss and fragmentation (caused by footprint creep, soil erosion, presence of stagnant water, etc.), increased exposure to atmospheric pollutants (caused by airborne dust), exposure to contaminants due to accidental spills, waste management and disposal, etc. Any incidental observation made during construction activities shall also be registered.	During the construction phase monitoring shall be performed monthly. Results will be presented within the Annually Biodiversity Report.	No increase in area beyond the permitted footprint. If an increase of 1% or more is detected per segment, work is to be halted immediately, and buffer zones must be enforced.	Contractor (ECoW)
Habitat restoration	Monitoring of the habitats where the measures of natural and aided restoration are recommended (E3 and C3.2 habitat types) and active restoration (91E0*, 91F0 and 91M0) have to be performed to ensure the correct re-vegetation of the area. Monitoring of conservation of 3150 habitat. Survey will be performed by an experienced botanist and suported by EcoW.	The monitoring surveys within these localities have to be every three months during the vegetative season (from April to September).	Restored areas with vegetation cover and composition similar to undisturbed areas Beginning of revegetation after completion of construction works. Revegetation will aim to achieve a minimum of 50% vegetation coverage within the first three years post-construction, with a	Contractor to engage external experienced botanist, ECoW to support

Monitoring activities	Description	Frequency /Timing	KPI	Responsibility
			survival rate of at least 70% for planted species by the end of the first growing season. Remedial actions may be necessary after the first two years of the "establishment" phase if there has been a loss of 30% of planted trees or more, or less than 90% coverage of vegetation (not trees).	
Invasive plants monitoring	Flora surveys will be undertaken to monitor the presence and spread of invasive plants within the Project area. Areas monitored will include areas recently disturbed such as soil and topsoil stockpiles, access roadsides, reclamation sites, etc.	The surveys will be performed by an experienced botanist, every month during the vegetative season (from April to October).	If invasive plant cover exceeds 10% of vegetation cover in any 100 m^2 plot, management actions shall be triggered, (manual removal, targeted herbicide application, or other appropriate control measures)	Contractor (ECoW), Contractor to engage additional expertise, if needed
Fauna				
Disturbance and fauna mortality	Organise pre-construction monitoring of land areas before construction activities start, to minimise disturbance of fauna. Surveys will include direct observation, camera trapping and observing nests, scat, burrows etc. If species protected on national level are found, Institute for Nature Conservation must be informed. In that case, work in the area will be postponed until relocation, stronger fencing,temporal work restrictions, or other measures in line with the Institute's opinion are to be implemented.	At least two weeks before the commencement of construction in each sector	Monitoring report No disturbance to protected species and response measures initiated if needed	Contractor (ECoW), Contractor to engage additional external biodiversity expertise, if needed
	Organise pre-construction monitoring of water areas before construction of bridges start, to minimise disturbance of fauna. This will include netting, visual census and electrofishing if needed. If migratory or spawning species are	At least two weeks before the commencement of construction in each sector	Monitoring report No disturbance to protected species and response measures initiated if needed	Contractor (ECoW), Contractor to engage additional external biodiversity

Monitoring activities	Description	Frequency /Timing	KPI	Responsibility
	present, construction timing must be adapted to avoid critical periods. In such cases, environmental authorities must be notified and species-specific mitigation applied.			expertise, if needed
	Conduct pre-construction surveys of birds in the year scheduled for construction to ensure up-to-date data is collected, given the potential for changes in habitat conditions. Focus will be on the parts of the route that intersect the pSPA "Dobrić-Nišava" (from km 220+315). Surveys will be conducted by a qualified ornithologist, who is to record species presence, abundance, breeding behaviour, and habitat use.	During peak breeding season (April–June), at least twice, every 2 – 3 weeks	Identification of any breeding pairs or nesting activity within the impact zone. Survey report with spatial data.	Contractor (if ECoW is an ornithologist), Contractor to engage additional external biodiversity expertise, if needed
	Check the area before construction to ensure that no breeding or wintering birds are present. This must be conducted at least twice, once in the early breeding season and once in peak breeding season. If active nests are found, a buffer zone of at least 50 meters must be established, and no construction will occur in this zone until fledging is complete.	Between March and July/August prior to commencement of works	No disturbance of birds during breeding period Minimum 50 m buffer enforced around active nests	Contractor (if ECoW is a qualified ornithologist), Contractor to engage additional ornithologist(s) if needed
	Check water bodies, ponds and wetland areas to minimise disturbance of amphibians during breeding period. This will be done through night-time visual encounter surveys, egg mass counts, as well as dip-netting. If species protected on national level are found, Institute for Nature Conservation must be informed. If breeding is detected, exclusion zones, stronger fencing or careful relocation must be implemented in line with Institute's opinion.	Between April and June	Minimize disturbance of amphibians during breeding period Minimum 25 m buffer established around confirmed breeding sites	Contractor (ECoW), Contractor to engage additional external biodiversity expertise, if needed
Pollution events	Monitor water quality at all bridge construction sites and construction areas near bodies of water to record immediately any leaks of oil, fuel, and other harmful substances	Daily visual inspection during the construction phase, laboratory analysis if accidents occur. Continuous	No exceedance of national water quality thresholds. Pollution events documented and	Contractor, accredited laboratory

Monitoring activities	Description	Frequency /Timing	KPI	Responsibility
	during construction. This will include visual inspections (oily sheen, algal bloom), measurements (pH, turbidity), and lab analysis (hydrocarbons, heavy metals). Environmental authorities must be notified of all accidents, which will be managed in line with spill response procedures.	monitoring done by managers of Fishing areas	emergency response initiated. Absence of pollution substances	
	Monitor the discharge of all contaminated effluents in water to preserve macroinvertebrates and fish, prior to any discharge into natural sources. Test for suspended solids, chemical oxygen demand (COD), biological oxygen demand (BOD), hydrocarbons, and pH.	During construction phase, after heavy rainfall.	Biodegradable, non-toxic construction materials and chemicals used; potential water contamination minimised	Contractor (EcoW)

7.2. Operational phase

The monitoring activities that must be implemented during the operations phase are presented in Table 7-2 below.

Table 7-2. Monitoring activities during the operation phase

Monitoring activities	Description	Frequency /Timing	KPI	Responsibility
Habitats and flora				
Monitoring of the restored area	Monitoring of restoration of temporarily disturbed grasslands; regular control and monitoring activities to compare with existing similar plots of E3 Wet or seasonally wet grasslands (cca 223+000 km) and C3.2 Water-fringing reedbeds and tall helophytes other than canes (between 225+000 km and 226+000 km).	Annually, in spring	Species composition and richness comparable to adjacent similar habitats Presence and cover in % of positive indicator species (e.g. *Alopecurus pratensis, Agrostis alba, Hordeum secalinum, Poa trivialis* for E3 habitat; *Typha* sp. for C3.2)	Contractor to engage experienced botanist, ECoW to support (from completion of construction and during Contract warranty period or similar) Company (SRI) thereafter
Monitoring of forest habitat offsets	Monitoring of restoration of 91E0* Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*)	Every 6 months for 5 years	Survival rate of planted trees of at least 30 %. At least 80% vegetation cover in revegetated areas, with native species representing	Contractor to engage experiences botanist, ECoW to support (from completion of

Monitoring activities	Description	Frequency /Timing	KPI	Responsibility
	91F0 Riparian mixed forests of *Quercus robur, Ulmus laevis* and *Ulmus minor, Fraxinus excelsior* or *Fraxinus angustifolia*, along the great rivers (*Ulmenion minoris*) and 91M0 Pannonian-Balkanic turkey oak – sessile oak forests		90% of the composition. Presence and cover in % of positive indicator species (e.g. *Salix alba and Populus alba* for 91E0* habitat, *Quercu robur, Fraxinus exscelsior. F. angustifolia* for 91F0 habitat, *Quercus cerris* and *Q. frainetto* for 91M0) Revegetation success will be evaluated through comparing results to pre-disturbance conditions. If monitoring reveals that revegetation efforts are not meeting success (such as low survival species rates, poor growth) adaptive management have to be triggered. Adaptive management implies implementation of corrective actions such as replanting with different planting techniques, controlling invasive species, adjusting the timing of planting etc.	construction and during Contract warranty period or similar) Company (SRI) thereafter
Monitoring of conservation	Monitoring of conservation of 3150 Natural eutrophic lakes with *Magnopotamion* or *Hydrocharition* -type vegetation	Every 6 months for 5 years	Monitoring will aim to assess the species composition and dominance of pecies such as *Ceratophyllum demersum*, *Potamogeton* spp. Data will be compared with pre-Project baseline conditions and adjacent, similar habitats. Vegetation must be stable or	Contractor to engage experiences botanist, ECoW to support (from completion of construction and during Contract warranty period or similar) Company (SRI) thereafter

Monitoring activities	Description	Frequency /Timing	KPI	Responsibility
			increasing, with no increase in invasive species coverage. Species composition and richness comparable to adjacent similar habitats	
Fauna				
Invasive plants monitoring	The monitoring of the status of Invasive plant species is to be continued and regularly performed during the operational phase.	Every three months during the vegetative season (from April to October)	Invasive plant cover does not exceed 5% of total vegetative cover in sensitive or priority habitat areas No net annual increase in cumulative invasive plant cover across monitored sites No spreading of invasive species	Contractor to engage experienced botanist, ECoW to support (from completion of construction and during Contract warranty period or similar) Company (SRI) thereafter
Collision mortality	Organise monitoring to report on accidental deaths of reptiles, birds and mammals, due to collision and/or electrocution. The surveys may be conducted by maintenance staff, train operational staff etc. The surveyor must track the number of carcasses per km of the railway route. Hotspots of collision must be noted, and consider installing flight diverters, denser fencing to keep fauna out, insulation and line markers for poles identified as a risk for electrocution.	Monthly during the first year in operation phase	Monitoring reports The data will be compiled and analysed, and in case the number of carcasses exceeds 10 per km of the route, corrective measures must be put in place.	SRI
Habitat connectivity	Proposed pass for amphibians, reptiles and mammals must be monitored annually to ensure that there are no blockages and maintained for the lifetime of the railway. Monitoring of the railway fence and amphibian and reptile protection fences and checking for damages must also be performed by SRI personnel.	Annually	Bridges/passes are maintained in the appropriate way Damages of fencing reported and repaired within three months	Company (SRI)

Monitoring activities	Description	Frequency /Timing	KPI	Responsibility
Species presence	Establish monitoring programme to evaluate whether the breeding species found within the PAoI that moved on during construction due to disturbance/loss of habitats, came back. Monitoring will begin in the first breeding season and continue for a minimum of five years. Conduct targeted field surveys during these periods for some umbrella species selected to represent different ecological needs of disturbed birds – e.g. *Streptopelia turtur*, *Dryocopus martius*, *Alcedo atthis* and *Coturnix coturnix*. This must be done in consultation with an ornithologist. The newly acquired data will be compared to baseline data, any barriers to species return will be noted. Annual monitoring results will be compiled into technical reports, with summary tables of species presence/absence, breeding confirmation, and habitat status	Annually	Number of confirmed breeding pairs or territories re-established for umbrella species. Return of at least 60% of displaced breeding species by year 3. If target species do not return or breed within three years, a corrective action plan (habitat enhancement, noise reduction, predator control) must be developed and implemented.	SRI
Offset success	Establish monitoring programme to assess the presence and habitat use of fauna species associated with the Project's net gain and CH/PBF offset requirements. Methods of surveys must correspond to each target species group. Monitoring will aim to assess habitat quality and ecological connectivity through indicators of vegetation cover, water quality, presence of invasive species. An adaptive management framework must be in place to respond to monitoring outcomes, ensuring offset performance goals are achieved.	Annually	All species triggering PBF/CH recorded in offset area within two years from offset area instatement Minimum 80% occupancy rate of expected suitable habitat patches by target species within 3 years	Contractor to engage a varying biodiversity expert (during the Contract warranty period or similar) Company (SRI) thereafter

8. REPORTING

If a Project facility (worker camps, access roads, waste dump sites, etc.) is placed within the predefined avoidance zones without approval from the Company, the Contractor must notify the Company. The Contractor, using its ECoW and biodiversity experts, will prepare an appropriate protocol for habitat restoration, as well as a relocation protocol for certain Project facilities. The reporting on such incidents is obligatory and has to be performed within 72 hours of occurrence.

Reporting on monitoring activities and frequency have to be performed in line with monitoring plan (7. Monitoring)

Offset measures for 91E0* Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*), 91F0 Riparian mixed forests of *Quercus robur, Ulmus laevis* and *Ulmus minor, Fraxinus excelsior* or *Fraxinus angustifolia* and 91M0 Pannonian-Balkanic turkey oak – sessile oak forests must be implemented. First a location of the offset is to be selected. It must be an analogue habitat in Project-adjacent area covering at least mentioned areas for every habitat. By targeting such areas with concrete actions, the aim is to raise the habitat quality to “good” with “medium” distinctiveness (as per Traweek et al., 2010). Offset measures for 91E0* Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) must be implemented through active management practices on a surface no less than 2.39 ha. To compensate habitat loss, afforestation has to be carried out with autochthonous species: *Salix alba* and *Populus alba*. Offset measures for 91F0 Riparian mixed forests of *Quercus robur, Ulmus laevis* and *Ulmus minor, Fraxinus excelsior* or *Fraxinus angustifolia* must be implemented through active management practices on a surface no less than 2.59 ha. To compensate habitat loss, afforestation has to be carried out with autochthonous species: *Quercus robur* and *Fraxinus angustifolia* Offset measures for 91F0 91M0 Pannonian-Balkanic turkey oak – sessile oak forests must be implemented through active management practices on a surface no less than 9.03 ha. To compensate habitat loss, afforestation has to be carried out with autochthonous species: *Quercus frainetto* and *Quercus cerris*. Revegetation has to start after completion of construction works. Revegetation will aim to achieve a minimum of 50% vegetation coverage within the first three years post-construction, with a survival rate of at least 70% for planted species by the end of the first growing season. Remedial actions may be necessary after the first two years of the “establishment” phase if there has been a loss of 30% of planted trees or more, or less than 90% coverage of vegetation (not trees). ECoW must prepare 91E0*, 91F0, and 91M0 habitat management guidelines and establish the management to be provided to SRI to continue management into the operational phase.

Given that invasive plant species have a strong negative impact on biodiversity and human health, construction and operation teams must be informed about invasive plants recorded within the Project area. Construction works can provoke their spread into uninvaded areas. During the operation phase, the spread of invasive plant species is possible and can be caused by the accidental introduction of invasive species, as well as by changing the ecological conditions of the habitat. The spread of invasive species will be reported immediately to the environmental manager.

The environmental manager will inform ECoW, who will propose improvements of the Invasive Alien Plant Species Management Plan. The reporting on the incident is obligatory and has to be performed within 72 hours of initial observation.

8.1. Chance Finds Procedure

To avoid additional potential habitat loss, degradation, or fragmentation and disturbance of species, it is important to develop an Ecological Chance Finds Procedure as part of the Construction Environmental and Social Management Plan. The Contractor is responsible for the implementation of the Chance Finds Procedure.

8.2. Scope of the chance find procedure

The Ecological Chance Finds Procedure must give instructions to the construction team on the protocol to be followed if any elements of concern are incidentally found within the active construction footprint during construction works. Identifying elements of interest is the first step within this procedure. Upon identification of the potentially important biodiversity receptor, analysis of its conservation status and assessment with regard to the EBRD and EIB PBF/CH criteria must be performed and EAAAs identified. In addition to identified EAAAs CHs and PBFs, animal refuges and shelters, such as nesting or breeding areas, reptile or mammal burrows and roosts represent elements of interest. Species of concern that are targeted by a chance find procedure are typically small-bodied fauna species (lizards, snakes, rodents, bats, and others) which may be accidentally encountered at the Project area during construction works.

All employees, especially those working on earth movements, have to be inducted on the identification of potential elements of interest and the relevant actions for them with regards to this procedure during the Project induction and regular toolbox talks.

8.3. Chance finds procedure

The following procedure shall be followed if any of the above elements of concern are incidentally found within the active construction footprint during activities and immediately require a stop to activities that risk endangering the animal or plant or their nesting/breeding/roosting/refuge site:

- Stop all activities in the immediate area (within a 20 m buffer), until a solution is found for the preservation of this find or advice from the relevant authorities is obtained;
- Immediately notify an Environmental Manager, who will inform ECoW;
- ECoW to delineate the discovered site or area and undertake preliminary evaluation of the findings. The ECoW has to perform a rapid assessment of the site or determine its importance. Based on this assessment, the appropriate protocol must be implemented through a relocation/restoration protocol. The significance of the findings must be assessed according to the criteria relevant to biodiversity conservation;

- If the receptor is of particular sensitivity and important on the national level and findings must be reported in line with national legislation, the Institute for Nature Conservation of Serbia is to be informed;
- The biologist/ecologist will engage where appropriate or preserve the exclusion buffer until the biodiversity receptor of concern has left the area.
- ECoW to ensure and confirm no other such receptor is present in the vicinity of the construction zone;
- The Environmental Manager will approve the recommencement of works once informed by the ECoW of the performed activities.

The reporting on chance find incidents is obligatory. The report on all described chance finds incidents will contain:

- Incident logging and documentation,
- Time, date and location of chance find,
- Pictures,
- Action taken and justification.

Each chance finding an incident must be reported through:

- Monthly reports of chance find incidents during the construction or operations to be prepared by the Environmental Manager.
- Assessment of chance find,
- Action taken and justification,
- Documents (pictures and GPS records),
- Continued log of all chance finds throughout the Project.

ECoW is responsible for the implementation of mitigation measures and monitoring of the BMP. So, this expert will perform continuous ecological inspection of the Project area, especially the working zone. It is possible that the qualified expert finds habitats, flora and/or fauna species of interest which was not recorded during previous field surveys. The expert will have an obligation to perform an impact assessment and develop an adequate protocol to avoid, reduce, or restore the possible impact.

9. TRAINING

The Contractor is obliged to provide appropriate training for their employees regarding biodiversity issues, so that the activities do not generate impacts on biodiversity. Contractor's Representative(s) – ECoW and/or engaged external qualified biologist(s) and/or ecologist(s) shall develop an internal biodiversity training protocol to train internal staff to enable these staff members to provide support to the Contractor.

Measures regarding the control of invasive species have to be fully implemented to avoid the introduction and spread of invasive species within the Project Area or the wider landscape and nearby protected areas. In order to control the spread of or prevent the introduction of invasive species, the training of site staff must be provided.

The need for further training will be identified during the construction process.

Republic of Serbia
Ministry of European Integration

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