



PRIORITISED ACTION FRAMEWORK (PAF) FOR NATURA 2000 in SLOVENIA

pursuant to Article 8 of Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (the Habitats Directive)

for the *Multiannual Financial Framework* period 2021 – 2027

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A. Introduction

A.1 General introduction

Prioritised action frameworks (PAFs) are strategic multiannual planning tools, aimed at providing a comprehensive overview of the measures that are needed to implement the EU-wide Natura 2000 network and its associated green infrastructure, specifying the financing needs for these measures and linking them to the corresponding EU funding programmes. In line with the objectives of the EU Habitats Directive¹ on which the Natura 2000 network is based, the measures to be identified in the PAFs shall mainly be designed "*to maintain and restore, at a favourable conservation status, natural habitats and species of EU importance, whilst taking account of economic, social and cultural requirements and regional and local characteristics*".

The legal basis for the PAF is Article 8 (1) of the Habitats Directive², which requires Member States to send, as appropriate, to the Commission their estimates relating to the European Union co-financing which they consider necessary to meet their following obligations in relation to Natura 2000:

- *to establish the necessary conservation measures involving, if need be, appropriate management plans specifically designed for the sites or integrated into other development plans,*
- *to establish appropriate statutory, administrative or contractual measures which correspond to the ecological requirements of the natural habitat types in Annex I and the species in Annex II present on the sites.*

Prioritised action frameworks shall therefore focus on the identification of those financing needs and priorities that are directly linked to the specific conservation measures established for Natura 2000 sites, in view of achieving the site-level conservation objectives for those species and habitat types for which the sites have been designated (as required by Article 6(1) of the Habitats Directive). Given that the Natura 2000 network also includes the Special Protection Areas (SPAs) designated pursuant to the EU Birds Directive 2009/147/EEC³, the financing needs and priority measures associated with bird species in SPAs are therefore also considered here.

Member States are invited to also present in their PAFs additional measures and their financing needs related to wider green infrastructure (GI)⁴. Such green infrastructure measures are to be included in the PAF where they contribute to the ecological coherence of the Natura 2000 network, including in a cross-border context, and to the objective of maintaining or restoring favourable conservation status of the targeted species and habitats.

In its Special Report N° 1/2017 on Natura 2000⁵ the European Court of Auditors concluded that the first completed PAFs (for the MFF period 2014-2020) did not present a reliable picture of the actual costs of the Natura 2000 network. The report therefore highlighted the need for updating the PAF format and providing further guidance for improving the quality of information that Member States provide in their PAFs. The recent

¹ Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:01992L0043-20130701>

² Article 8 (1): "In parallel with their proposals for sites eligible for designation as special areas of conservation, hosting priority natural habitat types and/or priority species, the Member States shall send, as appropriate, to the Commission their estimates relating to the Community co- financing which they consider necessary to allow them to meet their obligations pursuant to Article 6 (1)."

³ Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32009L0147>

⁴ Green Infrastructure is defined as 'a strategically planned network of natural and semi-natural areas with environmental features designed and managed to deliver a wide range of ecosystem services'.

⁵ Special Report No 1/2017: More efforts needed to implement the Natura 2000 network to its full potential <https://www.eca.europa.eu/en/Pages/DocItem.aspx?did=40768>

EU Action plan for nature, people and the economy⁶ commits to this process, with a view to ensuring that Member States provide more reliable and harmonised estimates of their financing needs for Natura 2000.

In its conclusions on this action plan⁷, the Council of the European Union recognises the need for further improving the multiannual financial planning for investments in nature and agrees that there is a need to update and improve the PAFs. The importance of better forecasting the financing needs for Natura 2000 ahead of the next EU Multiannual Financial Framework is also recognised in a resolution by the European Parliament⁸.

A.2 Structure of the current PAF format

The current PAF format is designed to provide reliable information about the priority Natura 2000-related financing needs, with a view to their incorporation in the relevant EU funding instruments under the next Multiannual Financial Framework (MFF) 2021-2027. To this aim, the PAF requires a level of breakdown of financing needs that would allow for an effective allocation of the Natura 2000 funding under the relevant EU funds for the MFF 2021-2027. With a view to that goal, the PAF also takes into consideration the experience that EU Member States and regions have gained so far with the MFF 2014-2020.

An essential component of the current PAF format is the required breakdown of the Natura 2000- and green infrastructure-related conservation and restoration measures per broad ecosystem category. The proposed ecosystem typology of 8 classes is very largely based on the MAES typology, which was established as a conceptual basis for an EU wide ecosystem assessment⁹. A comprehensive database allocating individual species and habitat types of EU importance to the MAES ecosystems is available for download from the European Environment Agency website¹⁰. It is recommended that the allocation of measures and costs to ecosystem types should largely follow this typology.

The presentation of priority measures and costs of the current PAF requires a distinction between running costs and one-off expenditure. Whereas running costs are typically associated with recurring measures that need to be continued in the long term (f. ex. staff costs for site management, annual payments to farmers for agri-environmental measures on grasslands, etc.), one-off expenditures are typically related to non-recurring actions such as habitat restoration projects, large infrastructural investments, purchase of durable goods, etc. The correct allocation of costs to either category ("running" versus "one-off") will be highly relevant for a correct allocation of measures under different EU funds.

Finally, priority measures under this PAF will not only contribute to the specific objectives of the EU nature directives, but will also provide important socio-economic and ecosystem service benefits to the society. Examples of benefits may include climate mitigation and adaptation, or other ecosystem services such as those related to tourism and culture. The Commission has already provided an overview of ecosystem services benefits related to Natura 2000.¹¹

This aspect should be emphasized where possible, with a view to promote and communicate the wide societal benefits of funding nature and biodiversity.

⁶ COM(2017) 198 final: An Action Plan for nature, people and the economy

http://ec.europa.eu/environment/nature/legislation/fitness_check/action_plan/communication_en.pdf

⁷ <http://www.consilium.europa.eu/en/press/press-releases/2017/06/19/conclusions-eu-action-plan-nature/>

⁸ European Parliament resolution of 15 November 2017 on an Action Plan for nature, people and the economy (2017/2819(RSP)) <http://www.europarl.europa.eu/sides/getDoc.do?type=TA&language=EN&reference=P8-TA-2017-0441>

⁹ <https://biodiversity.europa.eu/maes>

¹⁰ Linkages of species and habitat types to MAES ecosystems <https://www.eea.europa.eu/data-and-maps/data/linkages-of-species-and-habitat#tab-european-data>

¹¹ <http://ec.europa.eu/environment/nature/natura2000/financing/>

A.3 Introduction to the specific PAF of Slovenia

Slovenia is among EU countries the highest biodiversity and is a global hotspot in subterranean biodiversity. More than 38% of its territory is included in the Natura 2000 network, which is challenging for management and monitoring.

A third of Slovenia's Natura 2000 sites overlap within the Large-scale protected areas like national, regional or landscape parks or Small-scale protected areas like natural monuments, strict nature reserves or nature reserves. State established large-scale protected areas have designated competent managing authorities responsible for the area, including management of Natura 2000 sites. Together, Natura 2000 areas and protected areas create an important network of biodiversity rich areas with nature conservation status, which covers more than 50% of Slovenia's territory.

Natura 2000 sites outside protected areas have no specific management plans. Therefore, *The Decree on special protection areas (Natura 2000 areas)* (Official Gazette of the Republic of Slovenia, nos. 49/04, 110/04, 59/07, 43/08, 8/12, 33/13, 35/13 – corr., 39/13 – Constitutional Court Decision, 3/14, 21/16 and 47/18) which stipulates special protection areas or Natura 2000 sites, also states conservation objectives for these areas and protection guidelines for the preservation or achievement of a favourable conservation status of species of wild flora and fauna, their habitats and habitat types and other types of code of conduct to preserve these areas. Furthermore, it prescribes *the Natura 2000 Management programme*, as a nature conservation operational plan adopted by the Government.

It is the basic planning document that attains conservation objectives at each Natura 2000 sites, and includes the determination of detailed conservation objectives, conservation measures or more detailed protection guidelines, their holders or contractors responsible for the implementation of conservation measures, and potential financial resources for each Natura 2000 site. It facilitates horizontal connections with strategic plans and development programmes. In addition, the management programme determines priority projects which facilitate exploiting the opportunities at Natura 2000 sites for local and regional development, jobs and economic growth, and cultural heritage preservation taking into account the economic, social, cultural and demographic characteristics, and sustainable development principles. It also determines activities for the elimination of insufficient required research, expertise, data and monitoring.

The present document, Prioritised Action Framework (PAF) for Natura 2000 in Slovenia, includes necessary finances for realisation of the above stated Natura 2000 Management programme 2021-2027. It has been compiled for the entire Slovenian territory. The cost of existing projects, activities and support schemes as well as the activities planned in action plans of parks were taken into account when assessing the financial needs.

The present PAF was compiled by the Ministry of the Environment and Spatial Planning based on the information gathered by different organizations, all mentioned in chapters: E.1.6. References for horizontal measures and administrative costs related to Natura 2000), E.2.10 References for site-related maintenance and restoration measures within and beyond Natura 2000 and E.3.3 References for additional species-specific measures not related to specific ecosystems or habitats.

Financial assessments of EU and national financing of the Natura 2000 network during the period 2014 – 2020 were provided by competent authorities:

- Ministry of Agriculture, Forestry and Food for EARDF, EMFF and National Forest fund,
- Government Office for Development and European Cohesion Policy for ERDF, ERDF and INTERREG.
- the Ministry of the Environment and Spatial Planning for LIFE, National Climate Fund and national budget related financing of Natura 2000 related measures

Proposals and financial assessments of proposed priority measures for Natura 2000 network during the period 2021 – 2027 were kindly provided by a wide scale of stakeholders. In the first place, Institute of the Republic of

Slovenia for Nature Conservation (IRSNC) and Slovenia Forest Service (SFS) should be mentioned. In addition, also Slovenian Water Agency, The Fisheries Research Institute of Slovenia, Farmland and Forest Fund of the Republic of Slovenia, Slovenian Environment Agency, Slovenian state forests (SIDG - Slovenski državni gozdovi d.o.o.), The Slovenian Forestry Institute, National Institute of Biology, Marine Biological Station Piran, Centre for Cartography of Fauna and Flora, University of Ljubljana, Lutra - Institute for Conservation of Natural Heritage, University of Primorska, Research Centre of the Slovenian Academy of Sciences and Arts (Anton Melik Geographical Institute, DOPPS - Birdlife Slovenia and managing authorities of protected areas (Triglav National Park, Kozjansko Regional Park, Notranjska Regional Park, Škocjan Caves Regional Park, Goričko Nature Park, Ljubljansko barje Nature Park, Kolpa Nature Park, Strunjan Nature Park, Sečovlje Salina Nature Park, Logar Valley Nature Park, Debeli rtič Nature Park, Seasonal Lakes of Pivka Nature Park, Tivoli, Rožnik and Šiška Hill Nature Park, Škocjan zatok Nature Reserve) should be mentioned here.

The following issues occurred when compiling PAF:

- For the period 2015-2020 there is a comprehensive strategic planning document - Natura 2000 Management programme setting priorities. The compilation of a new Management programme is in preparation and therefore current PAF can not include a reviewed Natura 2000 Management programme 2021- 2027 and reviewed EU policies for the period 2021-2027. Therefore, it was not always possible to indicate the planned activities, their costs and the basis of cost calculation at the desired level of detail and the feasibility of some of the measures is not as reliable as desired;
- The detailed possibilities of funding of PAF measures by specific EU fund in the period 2021-2027 are not yet known, as the EU legislation for this financial perspective is not yet adopted, so possible planning of funding by EU is not as reliable as desired;
- Not all competent authorities of EU and national funds and sectors responsible for the implementation of conservation measures have records that are organized in such a way, that it is easy obtain information whether the measure financed were directly intended for Natura 2000 species or habitats or only occurred Natura 2000 sites; on the other hand the assessment of impacts of measures financed is also not established.
- Preliminary total allocation from the EARDF to the Member State is indicative. The final total amount and its allocation by activities and possible partial replacement by EAGF funds via the so-called eco-scheme are subject to the MFF agreement.
- Managing Natura 2000 is a permanent task, done with permanent management structures and services, therefore it is already a big challenge to change management, priorities, etc. every 7 years (every EU multiannual financial period). Additionally, many EU financing instruments are project based, requiring a project to be set up for a huge number of tasks that are by their nature permanent. This represents a huge organisational challenge and additional need for human resources for preparation of projects (many having different eligibility, selection and implementation rules). Human resources needed for this are much more difficult to get than for financing from programme based EU financing instruments.

B. Summary of priority financing needs for the period 2021-2027

		Priority financing needs 2021-2027	
		Annual running costs (Euros / year)	One-off / project costs (Euros / year)
1.	Horizontal measures and administrative costs related to Natura 2000		
1.1.	Site designation and management planning	530.000 – 800.000	580.000 – 960.000
1.2.	Site administration and communication with stakeholders	10.890.000 – 14.370.000	1.135.000 – 1.650.000
1.3.	Monitoring and reporting	2.364.000 – 3.599.000	825.000 – 1.351.000
1.4.	Remaining knowledge gaps and research needs	1.004.000 – 1.447.000	2.632.000 – 4.361.000
1.5.	Natura 2000-related communication and awareness raising measures, education and visitor access	1.730.000 – 2.906.000	560.000 – 850.000
	Sub-total	16.518.000 – 23.122.000	5.732.000 – 9.172.000
2.a	Natura 2000 site-related maintenance and restoration measures for species and habitats		
2.1.a	Marine and coastal waters	580.000 – 961.000	302.000 – 508.000
2.2.a	Heathlands and shrubs	50.000 – 100.000	-
2.3.a	Bogs, mires, fens and other wetlands	112.000 – 192.000	822.000 – 1.403.000
2.4.a	Grasslands	10.240.000 – 16.595.000	1.677.000 – 2.720.000
2.5.a	Other agroecosystems (incl. croplands)	n.a.	n.a.
2.6.a	Woodlands and forests	5.079.000	-
2.7.a	Rocky habitats, dunes & sparsely vegetated lands	180000 - 287000	335.000 – 555.000
2.8.a	Freshwater habitats (rivers and lakes)	2.900.000 – 4.250.000	5.425.000 – 8.835.000
2.9.a	Others	1.000.000 – 2.000.000	400.000 – 500.000
	Sub-total	20.141.000 - 29.464.000	8.961.000 – 14.521.000
2.b	Additional "Green infrastructure" measures beyond Natura 2000 (further improving coherence of the Natura 2000 network, including in a cross-border context)		
2.1.b	Marine and coastal waters	/	/
2.2.b	Heathlands and shrubs	/	/
2.3.b	Bogs, mires, fens and other wetlands	/	/
2.4.b	Grasslands	2.500.000 – 4.300.000	/
2.5.b	Other agroecosystems (incl. croplands)	/	/
2.6.b	Woodlands and forests	/	/
2.7.b	Rocky habitats, dunes & sparsely vegetated lands	/	80.000 – 125.000
2.8.b	Freshwater habitats (rivers and lakes)	100.000 – 150.000	350.000 – 450.000
2.9.b	Others	/	260.000 – 360.000
	Sub-total	2.600.000 – 4.450.000	690.000 – 935.000
3.	Additional species-specific measures not related to specific ecosystems or habitats		
3.1	Species-specific measures and programmes not covered elsewhere	90.000 – 160.000	3.000.000 – 4.300.000
3.2.	Prevention, mitigation or compensation of damage caused by protected species	1.325.000 – 1.800.000	0
	Sub-total	1.415.000 – 1.960.000	3.000.000 – 4.300.000
	Annual total	40.672.750 – 58.994.750	18.383.000 – 28.928.000
	Total (2021-2027)	413 - 615 M	

C. Current state of the Natura 2000 network

C.1. Area statistics of the Natura 2000 network

Slovenia designated the Natura 2000 sites in April 2004. The network was enlarged in 2013 and 2016, when Slovenia last time enhanced the Natura 2000 network. This network is aiming for conservation of 233 species (119 bird species and 114 species on the Annex II of the Habitats Directive) and 60 habitat types. In total, it comprises of 355 sites, encompassing approximately 37.5 per cent of the country. There are 324 SCI areas established under the Habitats Directive and 31 SPA areas established under the Birds Directive.

A particular characteristic of Slovenia is its great diversity of animal and plant species in a small area, and its well-preserved nature. Forests cover 71 per cent of the Natura 2000 network in Slovenia. Among non-forest areas, utilised agricultural land covers approximately 20 per cent of the Natura network. The most important are extensive meadows. In terms of surface, inland waters represent only slightly more than one per cent of the network, but they are the habitat of many Natura species and habitat types. An important part of the Natura 2000 network in Slovenia are caves and cave animals which are the subject of conservation in more than 70 sites. Human dwellings are important for the reproduction, resting and wintering of certain species. Therefore, some built-up areas are also essential at Natura 2000 sites. These are especially birds (e.g. white stork, Eurasian scops owl) and mammals (e.g. bats).

Region	Natura 2000 area data for Slovenia (in km ²)						Proportion (%) of Slovenia covered by:		
	Terrestrial			Marine			SCI	SPA	NATURA 2000
	SCI	SPA	NATURA 2000	SCI	SPA	NATURA 2000			
Alpine	3,669.4	2,942.6	4,163.8	0	0	0	47.9	38.4	54.4
Continental	2,967.2	2,126.5	3,511.7	0.1	0.1	0.1	23.5	16.9	27.8
Marine Mediterranean	0 ¹²	0 ¹³	0.1	0.8	5.0	5.4	0.4	2.3	2.6
Total	6,636.6	5,069.1	7,675.6	0.9	5.1	5.5	32.4	24.8	37.5

¹² Surface is less than 0.1 km²

¹³ Surface is less than 0.1 km²

C.2. Map of the Natura 2000 network in Slovenia

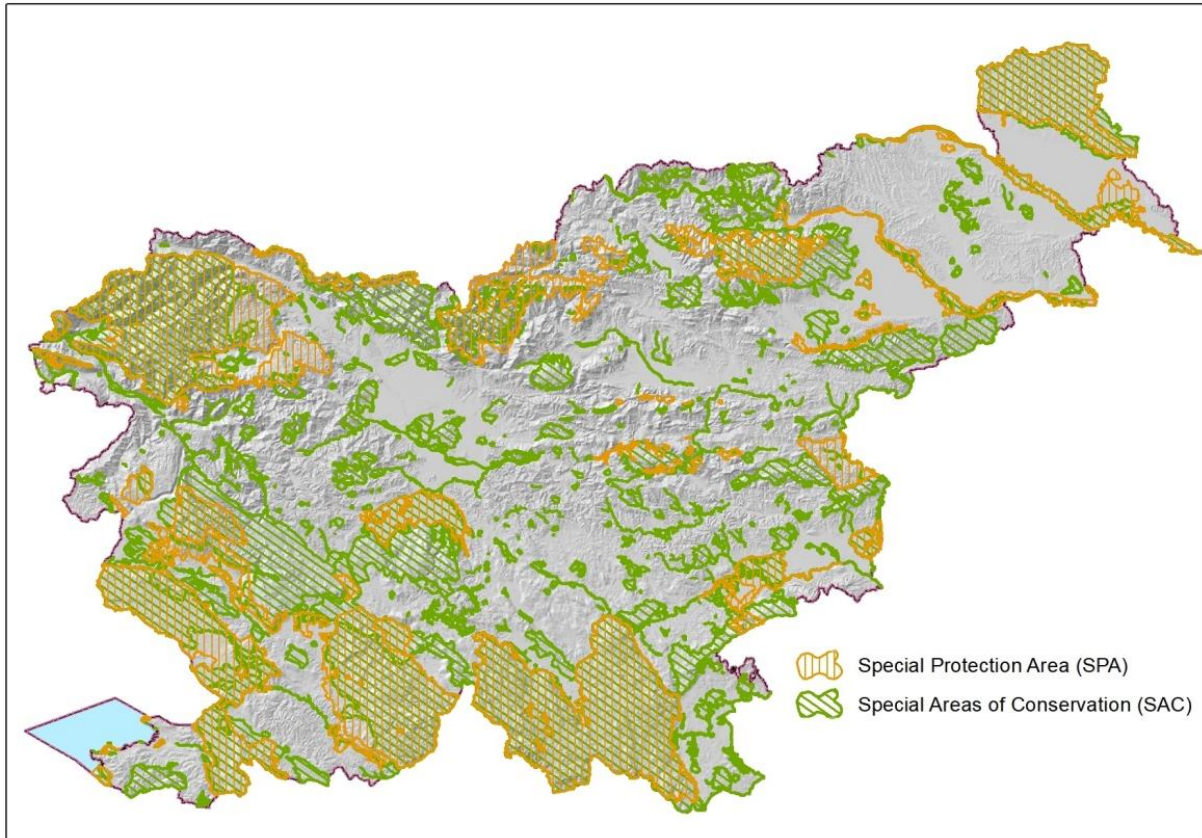


Figure 1: Natura 2000 sites (SPA, SAC) in Slovenia (IRSNC, 2019).

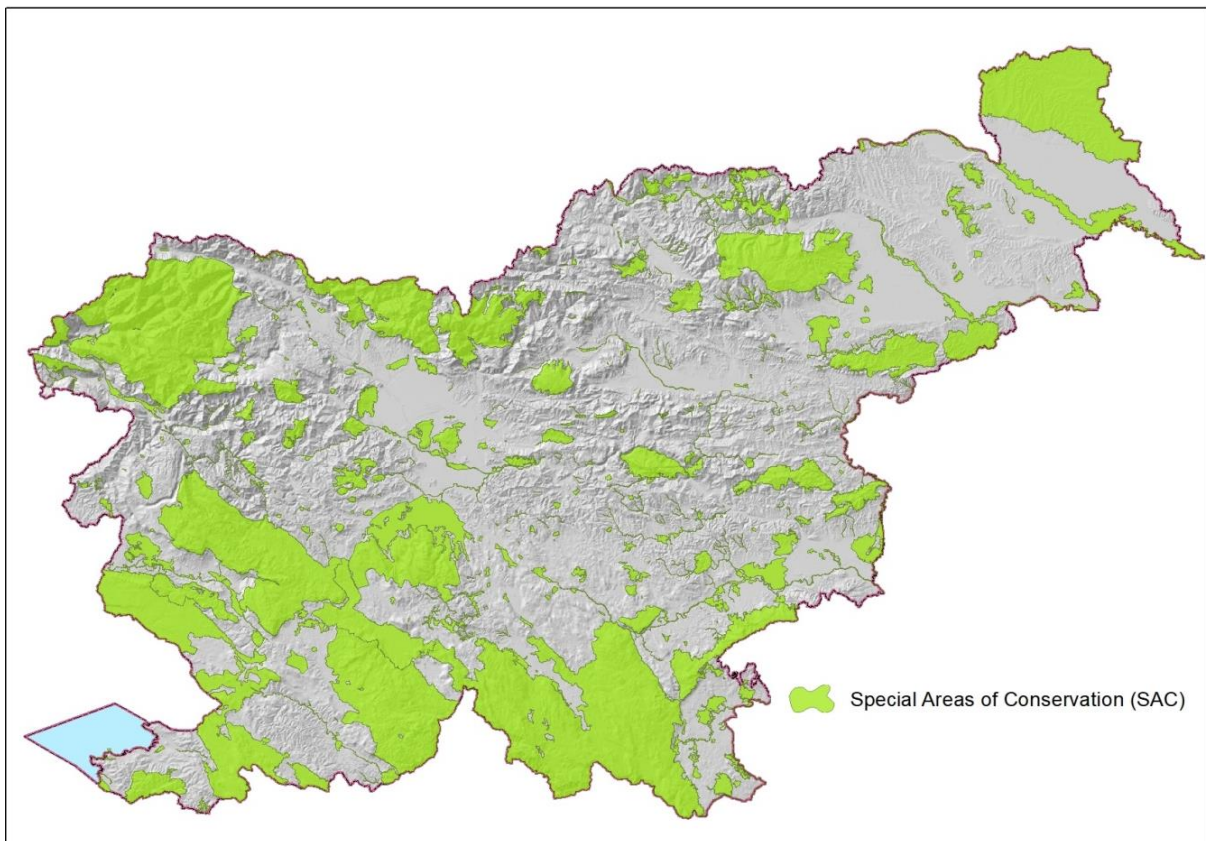


Figure 2: Special Areas of Conservation (SAC) in Slovenia (IRSNC, 2019), designated under the Habitats Directive (92/43/CEE)

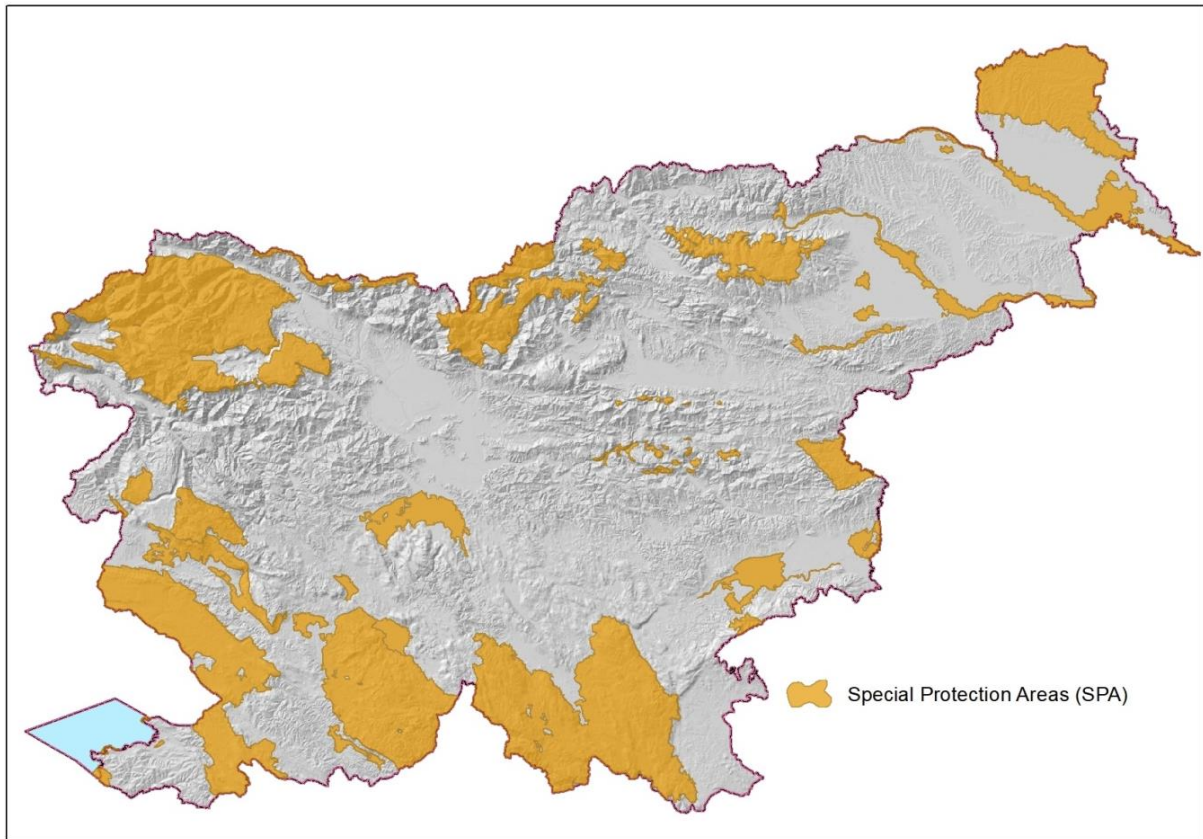


Figure 3: Special Protection Areas (SPA) in Slovenia (IRSNC, 2019), designated under the Birds Directive (79/409/CEE).

D. EU and national financing of the Natura 2000 network during the period 2014 – 2020

This section provides a comprehensive overview of the funding allocated to Natura 2000, protection of species of EU interest and green infrastructure during the period 2014-2020. This data should help the Commission and national/regional authorities to assess to what extent the financial needs of Natura 2000 are currently met and what the funding gap is.

D.1 European Agricultural Fund for Rural Development (EARDF)

Total allocation from the EARDF to the Member State/region:

Measure	Total current allocation to the EARDF measure		Current allocation to actions or sub-measures relevant for Natura 2000		Current spending on actions or sub-measures relevant for Natura 2000		Comments (relevance, experience to-date, challenges for the next period)
	EU	National	EU	National	EU	National	
M4 Investments in physical assets	161.907.332	53.969.111			113.016	37.672	payments on April 30, 2019 In Natura 2000 areas, restoration and establishment of traditional high-trunk meadow orchards has been funded by this measure according to conservation objectives as well as fencing of pastures to protect livestock against the large carnivores.
M7 Basic services & village renewal in rural areas	7.500.000	2.500.000			0	0	payments on April 30, 2019
M8 Investments in forest area	29.270.000	9.756.667			1.279.907	426.636	payments on April 30, 2019
M10 Agri-environment climate measures	155.345.540	51.781.847			6.206.483	2.068.828	payments on June 30, 2019 3.916.870 EUR were paid for 4 operations, which are dedicated for maintenance of habitats and species of EU importance (HAB: Special grassland habitats; MET: Grassland habitats of butterflies VTR: Habitats of birds of humid extensive meadows; STE: Litter meadows). Another 4.358.441 (Natura 2000 areas + outside) have been paid for operations (Conservation of steep meadow habitats, Hummocky meadows, Livestock rearing in area of the occurrence of large carnivores, Mountain pasture, High-trunk meadow orchards, Preservation of hedgerows) which contribute to the preservation and improvement of biodiversity in agricultural landscape.
M 11 – Organic farming	49.598.250	16.532.750			10.080.986	3.360.329	payments on June 30, 2019 13.441.315 EUR has been paid to agricultural holdings for parcels, which are located in Natura 2000 sites.
M12 Natura 2000 payments	Not programmed						
M13 Payments to areas facing natural or other specific constraints	189.461.196	63.153.732			35.643.629	11.881.210	payments on June 30, 2019 In measure M13 there are no additional environmental requirements for the farmers, nevertheless this measure contributed indirectly to the maintenance of the habitat types and species and prevents grasslands from overgrowing and land abandonment. 47.524.838 EUR were paid to agricultural holdings for parcels, which are located in Natura 2000 sites.
M15 Forest-environmental and climate services and forest conservation	Not programmed						
Other measures (M19.2)	30.086.487	7.521.622			90.244	22.561	payments on April 30, 2019
Subtotal	623.168.806	205.215.728			52.134.358	17.370.599	
TOTAL	828.384.534				69.504.957		

D.2 European Regional Development Fund (ERDF) / Cohesion Fund (ERDF)

Total allocation from ERDF to the Member State/region: **1 823 581 426 €**

Total allocation from Cohesion Fund to the Member State/region: **1 075 349 290 €¹⁴**

Category of intervention	Allocation to measures relevant for Natura 2000		Current spending on measures relevant for Natura 2000		Comments (relevance, experience to-date, challenges for the next period)
	EU	National	EU	National	
85 Protection and enhancement of biodiversity, nature protection and green infrastructure	23 872 132	5 968 034	15 080 496	3 770 124	Projects are approved following a direct confirmation procedure, which allows targeted financing.
86 Protection, restoration and sustainable use of Natura 2000	20 019 190	5 004 797	5 864 637	1 466 159	Projects are approved following a direct confirmation procedure, which allows targeted financing.
Other categories					
Subtotal	43 891 322	10 972 830	20 945 133	5 236 283	
TOTAL		54 864 152		26 181 417	

The amounts of allocated funds were gathered from official document of Operational Programme for the Implementation of the European Cohesion Policy in the 2014-2020 period with updates approved on 11th December 2018, page 220 (<https://www.eu-skladi.si/si/ekp/kljucni-dokumenti>).

The amount of current spending includes costs of approved projects broken down proportionally for measures 85 and 86.

D.3 European Maritime and Fisheries Fund (EMFF)

Total allocation from the EMFF to the Member State: **300 000 €**

Measure	Allocation to measures relevant for Natura 2000		Current spending on measures relevant for Natura 2000		Comments (relevance, experience to-date, challenges for the next period)
	EU	National	EU	National	
Promoting the implementation of the Integrated Maritime Policy (Article 80.1.b Promoting the protection of the marine environment and the sustainable use of marine resources in coastal marine resources)	225 000	75 000	106 000	35 000	Projects are approved following a public procurement procedure with targeted ToR, which allows targeted financing.
Subtotal	225 000	75 000	106 000	35 000	
TOTAL		300 000		141 000	

The amount of allocated funds was gathered from internal designation of funds in the framework of the Operational Programme for Slovenia for the implementation of the European Maritime and Fisheries Fund.

The amount of current spending includes costs of implemented projects until October 2019 (Monitoring of dolphins in the Slovenian sea for the 2013-2018 reporting period. Field mapping of Natura 2000 marine habitat types in the Slovenian Sea).

¹⁴ Information on the size of funds was gathered from the official European commission site for Slovenia: <https://cohesiondata.ec.europa.eu/countries/SI>.

D.4 LIFE Programme

Type of project or financing instrument	Current allocation to measures relevant for Natura 2000		Comments (number of projects, relevance, experience to-date, challenges for the next period)
	EU	National	
Traditional projects	16 603 500	9 261 487	Projects are approved following a bottom-up approach, which gives applicants the decision which eligible actions shall be implemented and financed. There have been 7 traditional projects in the priority area Nature and Biodiversity from LIFE call 2014-2018 with Slovenian Coordinating beneficiaries (LIFE14 NAT/SI/000005, LIFE16 NAT/SI/000708, LIFE15 GIE/SI/000770, LIFE16 GIE/SI/000711, LIFE16 NAT/SI/000644, LIFE16 NAT/SI/000634) and 3 projects (LIFE15 NAT/HR/000997, LIFE16 NAT/IT/000816, LIFE18 NAT/SI/000711) with Slovenian associated beneficiaries. Only allocation to Slovenian beneficiaries was taken into account.
Integrated projects	10 200 000	6 800 000	One (1) integrated project on enhanced implementation of Natura 2000 management programme LIFE17 IPE/SI/000011 - LIFE-IP NATURA.SI was approved and started with implementation in 2019.
Others (NCFE etc.)	/	/	
Subtotal	26 803 500	16 061 487	
TOTAL		42 864 987	

D.5 Other EU funds, including INTERREG:

Total EU co-funding allocated from other EU programmes with explicit investment priority 6d for the implementation of EU nature policy and associated green infrastructure in the Member State is: **10 238 513 €**.

Total national/regional funding allocated for the co-funding of these measures is: **1 806 798 €**.

Cross-border operational and transnational programmes

Slovenia is a beneficiary of four cross-border operational programmes and six transnational programmes.

Within cross-border programmes the following programmes have explicit priority 6d and directly contribute to maintenance and restoration of habitats and species of EU importance or to the integrity of Natura 2000 sites or to the coherence of the network:

Cross-border Programme Slovenia – Croatia (2014-2020) has four projects among explicit priority 6d with a budget:

5 932 000 € – only EU financing (both countries),

6 995 000 € – EU and national financing (both countries).

Cross-border Programme Slovenia – Italy (2014-2020) has three projects among explicit priority 6d with a budget:

4 813 000 € – only EU financing (both countries),

5 662 000 € – EU and national financing (both countries).

Cross-border Programme Slovenia – Austria (2014-2020) has no projects with explicit investment priority 6d although there are two projects where category of intervention is classified as 85 and contribute to the integrity of Natura 2000 sites or to the coherence of the network. Such are two projects with a budget:

1 695 000 € – only EU financing (both countries),

1 994 000 € – EU and national financing (both countries).

Cross-border Programme Slovenia – Hungary (2014-2020) has no projects with explicit investment priority 6d, neither are there any projects with a category of intervention classified as 85 or 86, but there are programmes with wider priorities set as 6c.

Total EU co-funding allocated from cross-border INTERREG EU projects with explicit priority 6d for the implementation of EU nature policy and associated green infrastructure in the Member State/region is: 5 574 492 €. Total national/regional funding allocated for the co-funding of these measures is: 983 735 €.

Additionally, within mentioned four cross-border operational programmes some projects have also wider priorities as 6d set (6d and 6c and/or 6f). These certain projects or parts of the projects contribute to maintenance and restoration of habitats and species of EU importance or to the integrity of Natura 2000 sites or to the coherence of the network:

Cross-border Programme Slovenia – Croatia (2014-2020):

22 113 000 € – only EU financing (both countries),
26 015 000 € – EU and national financing (both countries).

Cross-border Programme Slovenia – Italy (2014-2020):

14 167 000 € – only EU financing (both countries),
16 667 000 € – EU and national financing (both countries).

Cross-border Programme Slovenia – Austria (2014-2020):

15 478 000 € – only EU financing (both countries),
18 316 000 € – EU and national financing (both countries).

Cross-border Programme Slovenia – Hungary (2014-2020):

8 883 000 € – only EU financing (both countries),
10 450 000 € – EU and national financing (both countries).

Slovenia is also taking part in **transnational cooperation** in five transnational cooperation areas and in Operational Program **Interreg Europe**. Altogether Slovenia is participating in 59 international projects, which contribute to the maintenance and restoration of habitats and species of EU importance or to the integrity of Natura 2000 sites or to the coherence of the network. Out of these, 20 projects have explicit investment priority 6d, either their category of intervention is classified as 85 or 86:

Alpine space – 15 international projects (6 have direct impact on Natura 2000 sites, habitats or species).

Adriatic lenian – 7 international projects (1 has direct impact on Natura 2000 sites, habitats or species).

Central Europe – 6 international projects (3 have direct impact on Natura 2000 sites, habitats or species).

Danube area – 21 international projects (6 have direct impact on Natura 2000 sites, habitats or species).

Mediterranean area – 6 international projects (2 have direct impact on Natura 2000 sites, habitats or species).

Interreg Europe – 4 international projects (2 have direct impact on Natura 2000 sites, habitats or species).

Total EU co-funding allocated from transnational Interreg EU programmes for the implementation of projects that directly and indirectly contribute to maintenance and restoration of habitats and species of EU importance or to the integrity of Natura 2000 sites or to the coherence of the network is: 14 173 777 €. Total national/regional funding allocated for the co-funding of these measures is: 2 553 907 €.

Total EU co-funding allocated from transnational Interreg EU programmes for the implementation of projects **with explicit investment priority 6d** for the implementation of EU nature policy and associated green infrastructure in the Member State/region is: 4 664 021 €. Total national/regional funding allocated for the co-funding of these measures is: 823 063 €.

Altogether total EU co-funding allocated from cross-border INTERREG EU projects and transnational Interreg EU programmes with explicit priority 6d for the implementation of EU nature policy and associated green infrastructures amounts up to **12 045 316 €**. The list of the projects financed from the above funds is stated in the table below. Projects are approved following a bottom-up approach, which gives applicants the first decision, which eligible actions shall be implemented and financed. In some programmes the monitoring or programme committees have the second decision, which projects and actions shall be financed.

Type of the project	Neighbouring country	Project acronym	Project start date	Project end date	Investment priority	Total eligible expenditure allocated to the project for SLOVENIA (in EUR)	Allocated ERDF funds for SLOVENIA (in EUR)
Cross-border	Croatia	LIKE	1.09.2017	29.02.2020	6d	729 044	619 687
Cross-border	Croatia	ČIGRA	1.09.2017	29.02.2020	6d	269 490	229 067
Cross-border	Croatia	Carnivora	1.09.2018	28.02.2021	6d	1 333 666	1 133 616
Cross-border	Croatia	VEZI NARAVE	1.09.2018	28.02.2021	6d	1 731 450	1 471 733
Cross-border	Italy	CONA	1.09.2017	29.02.2020	6d	481 464	409 244
Cross-border	Italy	GREVISLIN	15.11.2018	14.11.2021	6d	1 500 225	1 275 191
Cross-border	Italy	NAT2CARE	1.10.2017	31.03.2020	6d	512 893	435 959
Transnational	CEN - CENTRAL	3Lynx	1.07.2017	30.06.2020	6d	214 060	181 951
Transnational	CEN - CENTRAL	BEECH POWER	1.04.2019	31.03.2022	6d	386 840	328 814
Transnational	DAN - DANUBE	ECO KARST	1.01.2017	30.06.2019	6d	634 695	539 491
Transnational	DAN - DANUBE	coop MDD	1.01.2017	30.06.2019	6d	367 800	312 630
Transnational	DAN - DANUBE	Sava TIES	1.06.2018	31.05.2021	6d	150 090	127 577
Transnational	DAN - DANUBE	MEASURES	1.06.2018	31.05.2021	6d	198 828	169 004
Transnational	DAN - DANUBE	REFOCuS	1.06.2018	31.05.2021	6d	492 996	419 046
Transnational	ASP - ALPINE	SPARE	16.12.2015	15.12.2018	6d	360 971	306 825
Transnational	ASP - ALPINE	ALPBIONET2030	1.11.2016	31.12.2019	6d	322 520	274 142
Transnational	ASP - ALPINE	HyMoCARES	1.11.2016	30.10.2019	6d	221 400	188 190
Transnational	ASP - ALPINE	RockTheAlps	1.11.2016	31.10.2019	6d	466 970	396 925
Transnational	ASP - ALPINE	Eco-AlpsWater	17.04.2018	16.04.2021	6d	273 246	232 259
Transnational	ASP - ALPINE	GreenRisk4ALPs	17.04.2018	16.04.2021	6d	398 425	338 661
Transnational	ADR - ADRIION	IMPRECO	1.01.2018	31.12.2019	6d	174 794	148 575
Transnational	ASP - ALPINE	AlpGov	7.06.2016	6.06.2019	6d	151 000	128 350
Transnational	MED -	WETNET	1.11.2016	30.04.2019	6d	233 755	198 692
Transnational	MED -	PHAROS4MPAs	1.02.2017	1.07.2019	6d	75 400	64 090
Transnational	IE - INTERREG	BIOGOV	1.07.2018	31.05.2022	6d	197 741	168 080
Transnational	IE - INTERREG	BID-REX	1.04.2016	31.05.2021	6d	165 553	140 720
					SUM	12 045 000	10 239 000

EEA and Norway Grants 2014-2021

The Member State is also benefiting from **EEA and Norway Grants 2014-2021**. EEA and Norway Grants are unique financial instruments based on the cooperation between Slovenia and three donor countries: Norway, Iceland and Liechtenstein. Driven by a common goal – reducing economic and social disparities within the European Economic Area (EEA) – EEA and Norway Grants also contribute to creating a world of equal opportunities, tolerance, safety, environmental sustainability and decent life. On 17 April 2018 Iceland, Liechtenstein and Norway signed new cooperation agreements with Slovenia on a number of new programmes under the EEA and Norway Grants 2014-2021. A total of EUR 37.7 million is made available to Slovenia in the period 2014–2021, of which EUR 19.9 million comes from the EEA Grants and EUR 17.8 million from the Norway Grants. Slovenia is a beneficiary in the programme *Climate Change Mitigation and Adaptation* where measures focus on sustainable mobility, restoration of the Natura 2000 Network ecosystems, circular economy, and promotion of use of geothermal energy and other less well-established renewable energy sources. Slovenia is for the implementation of the program entitled to 14.5 million €. The programme is co-financed by both financial mechanisms; 12 million € comes from the EEA Grants 2014-2021, and 2.5 million € from the Norway Grants 2014-2021. For restoration of the Natura 2000 network ecosystems there is an indicative allocation of a bit less than 2 MEUR.

D.6 Other (mainly national) funding for Natura 2000, green infrastructure and species protection in 2014-2020:

Total financing allocated to the implementation of EU nature policy and associated green infrastructure, for measures or projects not benefiting from any EU co-funding: **48,5 MEUR**.

Finances given in this chapter that were actually spent are mainly for costs for payments of employees, working on implementation of EU nature policy. Additionally, here are listed also two national funds that allocate finances for Natura 2000 in Slovenia: The Forest fund and National Climate Fund. Other costs for green infrastructure and species or habitat protection are listed in other chapters of this document.

National budget administered by the Ministry of the Environment and Spatial Planning for nature conservation is app. 8 MEUR yearly which includes also costs for the Institute of the Republic of Slovenia for Nature Conservation, public managing bodies of protected areas, co-founding of activities connected to Natura management of other public bodies (The Fisheries Research Institute of Slovenia, Slovenia Forest Service et al.). Of this for tasks 4 MEUR is spent yearly on tasks dealing with Natura 2000. Additionally costs for salaries of employees at the Ministry of the Environment and Spatial Planning and bodies within the Ministry who are working on Natura 2000 and the implementation of EU nature policy is ap. 1 EUR yearly.

The Forest Fund was established in 2016, based on the Management of State Forests Act. The Forest Fund is financed by two assigned revenue, namely revenues from the disposal of state forests and an annual compensation for the management of state forests. For the management of state forests, the company pays to the Republic of Slovenia an annual fee of 20% of the revenues from the sale of timber from state forests. According to the law, the funds of the Forest Fund are also intended for financing measures in the Natura 2000 sites in private forests in accordance with the Natura 2000 Management Programme (2015–2020) and the Forest Investment Program prepared by the Slovenian Forest Service in accordance with the National Forest Program. In 2017, 440 000 € was planned for measures in Natura 2000 for forest habitat types, based on the Forest Fund program. In this first year only 7 784 € was spent. In the year 2018, 200 000 € was planned for these measures, of which 164 937 € was spent. The unused funds of the Forest Fund are carried over from year to year and therefore, in 2019, 1 783 188 € is available for measures carried out in Natura 2000 sites for forest habitats. The estimated spending rate value in 2019 is approx. 750 000 €.

Nacional Climate Fund (established in 2009) is part of state budget under jurisdiction of Ministry of the Environment and Spatial Planning. It is financed with revenues, gained by selling emission coupons, which are part of greenhouse gas emissions trading scheme. These funds are then used to finance measures that contribute to mitigation and adaptation of climate changes (for example, promoting use of new technologies that help reduce CO₂ emissions in households). Starting from 2018 onwards, National Climate Fund is used also for climate mitigation/adaptation measures, related to Natura 2000 habitats and species protection. So far 3.35 million € have been allocated for Natura 2000 and species protection. Funds in the following years will be allocated according to their spending in previous years, available funds and content of proposed measures.

E. Priority measures and financing needs for 2021 – 2027

E.1. Horizontal measures and administrative costs related to Natura 2000

E.1.1. Site designation and management planning

Current status and progress made so far in terms of site identification, designation and management planning (situation: 01/10/19)

Slovenian Natura 2000 network has been designated for 233 species (required by both The Birds Directive and The Habitats Directive) and 60 habitat types. The procedure for designation of Natura 2000 sites in Slovenia is defined in Article 33 of the Nature Conservation Act, transposing Article 4 of the Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (Habitats Directive, HD) and Article 4 of the Directive 2009/147/EC of the European Parliament and of the Council on the conservation of wild birds (Birds Directive, BD). Legal site designation of Natura 2000 sites was done with adoption of governmental Decree on special protection areas (Natura 2000 areas), OJ RS, no. 49/04, that was amended in 2004, 2007, 2008, 2012, 2013, 2014, 2016 and in 2018. Network is considered sufficient, unless important new data from species with scientific reserve will show a need for new Natura 2000 sites.

Management planning is done by the Government, adopting Natura 2000 Management programme (PUN 2000) which includes the whole Natura 2000 network in Slovenia and is updated every EU Multiannual financial period. Currently, site level conservation objectives and site-level conservation and restoration measures are defined by the Natura 2000 Management programme for Slovenia for the period 2015-2020 (PUN 2000)¹⁵ prepared as a result of the LIFE+ project "SI Natura2000 Management Slovenia (LIFE11 NAT/SI/880)". It defines detailed conservation objectives for each species or habitat type at each Natura 2000 site, and conservation measures and guidelines to achieve these objectives (Appendix 6.1 Objectives and measures). Conservation measures are then being integrated in relevant implementing acts (10-year forest management plans, fisheries plans, spatial plans, yearly work plans of protected areas authorities, Operational programmes for drawing EU funds, etc.).

Sites of Community Importance (SCIs) under the EU Habitats Directive	Number of sites	Number of sites with:		
		legal site designation (SAC or equivalent)	specific site level conservation objectives	specific site-level conservation measures
Alpine	114		114	114
Continental	232		232	232
Total	324		324	324

Special Protection Areas (SPAs) under the EU Birds Directive	Number of sites	Number of sites with:		
		legal site designation (SAC or equivalent)	specific site level conservation objectives	specific site-level conservation measures
Slovenia	31	31	31	31
Total	31	31	31	31

Further measures needed

Broadly, further measures needed for management planning of Natura 2000 are:

- update and renewal of Natura 2000 Management Programme (2021-2027);
- integration of detailed conservation objectives and measures to implement them into relevant forest management plans, fisheries management plans, hunting management plans, water management plans, spatial development plans, etc;
- integration of detailed conservation objectives and measures to implement them into operational programmes for drawing EU funds (agricultural, structural and cohesion, fisheries, LIFE);
- update and renewal of relevant protected area management plans and yearly work programmes;
- Identification of possibilities for financing measures and activities for Natura 2000 in the new EU financial perspective
- Enhancing of implementation of management measures through internal and external capacity building.

¹⁵ <http://www.natura2000.si/index.php?id=330&L=1>

Renewal of Natura 2000 Management Programme (2021-2027) will be carried with support of the LIFE Integrated Project for Enhanced Management of Natura 2000 in Slovenia (LIFE 17 IPE/SI/000011 LIFE-IP NATURA.SI; duration: 2018-26) and considered by the government for establishment/updating site-level conservation objectives and measures stated in Natura 2000 Management programme (PUN 2000). Also identification of possibilities for financing measures and activities for Natura 2000 in the new EU financial perspective and integration of detailed conservation objectives and measures to implement them into operational programmes for drawing EU funds (agricultural, structural and cohesion, fisheries, LIFE) will be carried with support of the LIFE Integrated Project for Enhanced Management of Natura 2000 in Slovenia.

One of the most important challenges is to integrate biodiversity conservation objectives into the policies of key sectors. In particular, spatial development should be steered so as to ensure the conservation of biodiversity in the planning of the green system of urban areas and green infrastructure at national, regional and municipal levels, by balancing economic, social and environmental aspects. Instruments such as the assessment of plans and programs for the implementation of policies of other sectors should be better used and the biodiversity conservation measures identified in the plans and programs implemented in practice.

Integration of PUN 2000 detailed conservation objectives and measures into relevant sectoral plans (forest management plans, fisheries management plans, hunting management plans, water management plans, spatial development plans) and into relevant protected area management plans is done regularly by each sector involved in the management of Natura 2000 network and verified by the Institute of the Republic of Slovenia for Nature Conservation within mandatory state public utility services. Outlines for yearly work programmes of protected areas management authorities are issued regularly by the Ministry of the Environment and Spatial Planning and include tasks from PUN 2000. Programmes of work are then adopted by protected area administration councils and implemented. The Court of Auditors identified the greatest possibilities for improvement of intersectoral cooperation with regularly checking the implementation of conservation measures in the Natura 2000 sites. The Ministry has set up a checking system in which the data of the responsible holders from different sectors are collected. The challenge that will be additionally addressed in the future is to put in place a system that will enable to assess whether the measures envisaged are adequate and sufficient for the conservation of plant and animal species in the Natura 2000 protection areas.

A tighter cooperation between sectors for enhanced implementation of management measures, internal and external capacity building of competent institutions responsible for implementation of conservation objectives and measures of Natura 2000 Management Programme needs to be reinforced. Some of the activities contributing to this objective will be carried with support of the LIFE Integrated Project for Enhanced Management of Natura 2000 in Slovenia (LIFE 17 IPE/SI/000011 LIFE-IP NATURA.SI).

Prioritization of measures to be implemented during the next MFF period

All measures stated are considered as priority. Measures that directly contribute to improvement of habitats in unfavourable condition or have positive influence on species with unfavourable conservation status have a greater importance and will be considered first. Through the process of renewal of Natura 2000 management programme for period 2021-2027 (PUN 2000) prioritisation of measures, which will be based on conservation status and feasibility, will be made.

List of prioritized measures to be carried out, and estimated costs for these measures

Name and short description of the measures	Type of measure*	Estimated cost in Euros (annualised)	Possible EU co-funding source
Update and renewal of Natura 2000 management programme 2021-2027 (PUN 2000)	One off **	250 000 – 400 000	LIFE
Integration of detailed conservation objectives and measures into relevant sectoral plans and relevant existing protected area management plans	Recurring	100 000 – 150 000	LIFE
Preparation of scientific background documents for management plans of protected areas which include management plans for Natura 2000 sites in protected areas.	One-off	50 000 – 100 000	LIFE, ESF
Regular checking of the implementation of conservation measures in the Natura 2000 sites	Recurring	380 000 – 550 000	LIFE
Training & enhanced implementation of PUN 2000 measures on the field (capacity building)	One off **	280 000 – 460 000	LIFE, ESF, ERDF
Priority measures coming out of the Natura 2000 Management programme 2021-2027, that can't yet be defined	Recurring	50 000 – 100 000	

* indicate whether the measure is recurring or one-off
 **Measures will be implemented or established through the LIFE-IP NATURA.SI project, than implemented as recurring measure

Expected results

The Management programme for Natura 2000 network in Slovenia has been adopted by the government. Site level conservation objectives, restoration measures, detailed conservation objectives, conservation measures and guidelines for

each species or habitat type are defined so they meet the ecological demands of protected species and habitats. Conservation measures are integrated in relevant implementing acts in relevant sectors (farming, forestry, water management,...). Prioritisation of measures compiled on the basis of 2019 Habitats and Birds Directives reporting and measures are being implemented in accordance to the available funding.

E.1.2. Site administration and communication with stakeholders

Current status and progress made so far in terms of site administration and communication with stakeholders

In Slovenia, there is no special authority for the management of Natura 2000 network and duties are performed by several institutions. Management of Natura 2000, as stipulated by the Nature Directives (incl. the case law), is a permanent task. In Slovenia the "fil-rouge" for the management of Natura 2000 is led by public nature conservation institutions (presented below), which are responsible for performing almost all duties. These are performed as their regular tasks within mandatory state public utility services and therefore almost solely financed from the Slovenian state budget, also in SACs, where Article 8 of the Habitats Directive applies.

The Ministry of the Environment and Spatial Planning (MOP) is responsible for a broad set of issues, including biodiversity conservation, climate change, biotechnology, water and air conservation, waste management, spatial planning and impact assessments. MOP is preparing legal acts and adopting acts under their jurisdiction and is responsible for the implementation of national policy documents on nature conservation. MOP also oversees the work of all other institutions working in public service of nature conservation: the Institute of the Republic of Slovenia for Nature Conservation (IRSNC) and public institutes established for the management of national protected areas. Two sectors within MOP are in particular relevant for the management of Natura 2000 network: Sector for Nature Conservation and Sector for Environmental Impact Assessments.

Slovenian Environment Agency (ARSO) is a body of the MOP, which performs expert, analytical, regulatory and administrative tasks related to the environment, including nature conservation at the national level. Another body of MOP is Inspectorate for the Environment and Spatial Planning, which is performing law enforcement tasks.

Institute of the Republic of Slovenia for Nature Conservation (IRSNC) is the national expert institution which is organised in one central and seven regional units. In relation to Natura 2000, the most important tasks of IRSNC include: (i) monitoring of biodiversity, valuable natural features and caves, (ii) managing biodiversity databases, (iii) drawing-up of nature protection guidelines for spatial plans and natural resource use plans, (iv) preparing opinions in spatial planning procedures, natural resource use planning procedures, appropriate assessments and for the activities affecting nature, (v) preparing expert proposals of conservation measures and proposals for the establishment of new protected areas, (vi) cooperating in development of management plans of protected areas, (vii) expert procedures in administrative procedures of MOP, (viii) carrying out measures to preserve valuable natural features and biodiversity, (ix) assisting owners of land on valuable natural features and protected areas, (x) awareness raising, (xi) reporting, among others also on status of Natura 2000 target species and sites.

National protected areas are one of the most important nature conservation measures. According to the Nature Conservation Act, several types of national protected areas can be established in Slovenia. A small protected area can be designated as a natural monument, strict nature reserve or a nature reserve. A larger protected area can be designated as a national park, a regional park or a landscape park. Protected areas can be established by the state or municipalities or in a partnership of both. The founder is obliged to ensure proper management. Management of national protected areas is defined as a public service of nature protection and comprises measures for protection of biodiversity, natural and cultural values (among them, for example, management of habitats and species, control of water regimes, vegetation growth, invasive alien species, management of substitute habitats, control of the most sensitive biodiversity areas, control of visitors, etc.), monitoring, communication, provision of information, patrolling, contractual protection and others, which are supportive to maintenance or improvement of the favourable conservation status of species and habitat types in the overlapping Natura 2000 sites. Management of protected areas is performed by a dedicated institution, or it is devolved to an existing institution. Currently, management of nine protected areas (each of them managing one or more Natura 2000 sites) established by the state is ensured by nine state public institutes. Their work is supervised by MOP, which is also deciding on the level of financing from the state budget. In two cases, the state has awarded a concession for the management of protected areas. Municipalities are providing management directly or through dedicated institutes.

Municipalities have a relatively little role in the management of Natura 2000 network, except in the case they have established a protected area on their territory which is overlapping with Natura 2000 sites. If such protected areas have an operational management authority in place, some management tasks are devolved to them as well. EU funds (mostly LIFE and Regional Cohesion) are the main financial source for management of Natura 2000 sites in this case.

Implementing regular duties of Natura 2000 management requires a number of dedicated staff at each of the listed institutions. Slovenia's Natura 2000 network is the largest (in percentage of national territory) of all EU Member States, it is designated for achieving a favourable conservation status of very large number of Natura 2000 features (species and habitat types), and therefore requires a large number of staff to perform regular tasks. Because of limitations of the state budget (especially in the period of financial crisis) all listed institutions are insufficiently staffed for these duties. Regular duties are financially not supported by the EU funds, even if Article 8 of the Habitats Directive applies to SACs.

Implementing forest management in Natura 2000 sites, as well as hunting management and large carnivores' issues, involves public forestry service, performed by Slovenia Forest Service (SFS), which has one central and 14 regional unit. Regional units are further divided into 69 local units and 396 forest districts. The Slovenia Forest Service also comprises 10 state hunting grounds with special purpose whose task is sustainable management of wild animals, protection of rare and endangered animal species and they also perform activities of hunting tourism. Implementing forest management in Natura 2000 sites requires a number of dedicated staff in SFS. The largest part of Slovenian Natura 2000 network are forests, and they are designated for achieving a favourable conservation status of very large number of Natura 2000 features, and therefore require a large number of SFS staff to perform regular tasks.

One of the basic tasks of SFS is gathering and processing forest data on which all necessary duties required for forest management, preservation of forest habitats and preservation of species in the forest are planned. The basic plans that SFS prepares are determined for 10 year periods and are so called Forest management plans (FMP). In areas where forest overlaps with Natura 2000 sites, additional care for maintaining or improving a favourable conservation status of species and habitat types is provided. Procedure for development of this 10 year annual FMP is strictly regulated. It is regulated who and when can collaborate on plans and who approves the plan. Every year annual plans are prepared based on the long-term 10 year plans. In the beginning, both MOP and Ministry of agriculture, forestry and food (MAFF), have to be informed on the preparation of the annual/long-term FMP. In the procedure of developing FMP, IRSNC and Institute for the protection of cultural Heritage of Slovenia (IPCHS) take active role; they prepare nature conservation guidelines for managing forests or guidelines for cultural heritage within forests, respectively. These directions are then implemented in the plan. Both, in the beginning and in the end (at the representation of the draft FMP), land owners, forest users, nongovernment organizations and other interested public can give ideas and comments which can then be implemented in the FMP. Municipalities are also informed and can mediate their comments to the plan. In the end MAFF reviews the annual/long-term FMP and the minister signs it.

Additionally, area of a FMP is divided in smaller sections, with approximate size from 30 to 50 ha, depending on the relief and ownership of the forest. For these sections detailed planning is then repeated, only on smaller scale. These plans are called Forest cultivating plans (FCP). The process of making FCP is similar although simplified but measures are prescribed a lot more in detail. Again SFS prepares draft of the FCP and then prepares a public presentation where landowners, forest users, nongovernment organizations and other public can give their input. The conditions for forest management that governmental organisations like IRSNC and IPCHS gave in FMP should be abided by in FCP. When FCP are finished they are signed by the responsible person of SFS. These FCP have no strict time period, but should be renewed, when conditions in the forest change so much, that they are not relevant any more, or when a landowner gives an initiative for the renewal of the FCP.

SFS is also responsible for managing populations of game animals in and outside the forest based on the Game and Hunting Act. With reference to this SFS prepares long-term (10 year period) and short term (yearly) hunting management plans (HMP). Long-term hunting plans are based on the analyses on present data of game species and their habitats. They prescribe long-term goals for each species; measures and directions for their realization are also determined. In short term hunting plans culling quotas for each game species is determined in accordance with long-term hunting plans. With the density of game populations animal's health and ecosystems are also managed. The HMP are even more vigorously planned in the areas where animals live in Natura 2000 sites and in special purpose state hunting grounds. The preparation of HMP is similar to the preparation of the FMP. Draft version of HMP is consulted with Slovenian hunting organization. Further on it is presented to hunting organizations of the area, IRSNC, Chamber of agriculture and forestry of Slovenia (KGZS) and other interested public. MOP and MAFF are informed and invited to give comments and approval at the end. Till 10th of April at the latest the HMP are sent to the MAFF in the review and then to be signed by the minister.

Managing protected and non-protected fish populations is divided regarding the type of habitat: freshwater and marine ecosystems. Both groups of fish species are regulated in regard to their own law: Freshwater Fisheries Act and Marine Fisheries Act. In fresh water areas the general long-term guidelines for management of fish are adopted by the government with The Program for the Management of Fish proposed by MAFF. These are a long-term 12 year period guidelines, which on the evaluation of the size of population and state of habitat predicts measures that have to be taken to maintain the balance of ecosystem and fish in it, with all the protective measures in its essence.

Furthermore this Program for the Management of Fish is determined in details for 6 year period in fish managing plans so called Fishery and Farming Management Plan (FFMP). The FFMP are done by Fisheries Research Institute of Slovenia (FRIS) in collaboration with managers of fish areas (Fishing Families) and local communities and takes into account the ecological characteristics and distribution of fish species or populations which are important for maintaining a favourable ecological status, and regimes according to the regulations on nature conservation and water which could affect the implementation of the FFP. Before the acceptance of the FFMP, MAFF at the unveiling of the plan, informs the public and other interested participants with its content. The 6 year period FFMP is adopted by the MAFF on a proposal from the FRIS. FFMP are furthermore divided on fish breeding plans (FBP) which are also designed for a period of 6 years and are done by FRIS in collaboration with local area fish managers and local communities. FBP is also adopted by the MAFF on a proposal from the FRIS. These plans are a foundation for annual program report of fishery management. It manages the implementation of the fish breeding plan for each year based on an assessment of the situation in the fishing region in the previous year. The performer of fisheries management prepares the annual program by 31st December for the coming year and sends it to the FRIS for review and approval. The Freshwater Fisheries Act ensures that fisheries management is carried out in accordance with a fisheries breeding plan for each individual fishing region on the basis of the annual program.

Marine water fishing is regulated a bit different. The grounds for Slovenian Marine Fishing Acts are European Union regulations and the research and expert work in the field of marine fisheries that FRIS carries out, with its partners. FRIS gathers field data and the data that is linked to each fishing vessel; this enables an assessment of the socio-economic status in the marine fisheries. These data is then a basis for adopting measures which are in favour of sustainable development of angling areas and benefit the Slovenian fisheries sector and Slovenian fishermen. FRIS then produces evaluation of marine conditions which comprises with fisheries biology and fisheries economics and can then be put in a Fishing program. In regard to this research FRIS coordinates a Fishing program which determines the amount of marine life that can be taken out of the ecosystem. The fishing program is finally adopted by the government on a proposal by MAFF. Considering the fishing plan the permanent permits for economic fishing are given out to fishermen with their fishing vessels.

The agriculture and food strategy is implemented through the measures of the Common Agricultural Policy, namely of direct payments, regulated at EU level by Regulations, and national Rural Development Programme 2014-2020 (RDP 2014-2020). This programme is the most important operational document for the agricultural sector, outlining directions in the field of nature protection that could be considered in the planning processes at the Ministry responsible for agriculture.

Contrary to the other sectors, the agricultural sector in Slovenia does not have a spatially defined policy planning. Therefore measures for steering agricultural use are mainly stimulations and restrictions. Stimulations include Less Favoured Areas (LFA) that contribute to continuous agricultural use and keep farmers in these less favourable areas. Important stimulation are agri- environment measures which contribute to key Natura habitats, supporting measures to maintain grasslands and old growth orchards, hedgerows, and also low input fields. At the end there are targeted Natura 2000 agri-environment measures with prescriptions that reflect habitat needs of certain Natura 2000 species and habitat type groups (meadow birds, meadows with orchids, butterflies, etc). For these measures Natura 2000 management programme (PUN 2000) has set measurable targets.

The new generation of biogeographical seminars also revealed, that all main stakeholders, counting from managers, land owners to researchers, strive to a common objective, but are not united in support of the approaches and means leading to the objectives. In order to overcome these barriers and in finding and funding the best possible approaches, a strong inclusive approach is needed. It is necessary to regularly improve knowledge, exchange information and promote effective practices.

Each institution responsible for implementation of nature conservation measures has developed its own database/viewer with structure and functionality based on its particular needs. Consequently, data standardisation and harmonisation is not sufficient for a comprehensive and real-time data sharing. Integrated/hub of NCIS has not been developed yet. Monitoring

of the implementation of conservation measures and furthermore effects/effectiveness of measures requires a lot of time and effort (both in time and human resources) and is not as detailed and reliable as desired.

Further measures needed

Broadly, further measures needed for site administration and communication with stakeholders are:

- Enhanced site administration and communication with stakeholders by managers of protected areas, Institute of the Republic of Slovenia for Nature Conservation, Ministry of the Environment and Spatial Planning, Slovenian Environment Agency;
- Enhanced site administration and communication with stakeholders by Slovenia Forest Service;
- Enhancement of warden service for direct surveillance in nature;
- Increased capacity building of agriculture advisory service on central and regional units of Chamber of Agriculture and Forestry of Slovenia (KGZS) for implementing adapted agricultural practices with positive effects on species/habitat types and biodiversity and for cooperation with IRSNC;
- Increased capacity building of local authorities (municipalities) for spatial planning and implementing of measures with positive effects on species/habitat types and biodiversity (nature based solutions);
- Planning and implementation of measures to prevent, eradicate and manage IAS;
- Enhanced land acquisition of most critical habitats;
- Additional measures beyond Natura 2000 (preparation and novelation of required legal acts, establishment of new protected areas, Update on the Red List of Threatened Species Policy);
- National nature conservation information system.

Administration management planning and ownership over measures is the most important issue which should be stipulated within all sectors and also importantly, with land owners.

We need to enhance implementation of Natura 2000 measures. This may be done in several ways: (i) with improving collaboration and communication between policy makers and institutions responsible for implementing the management programme, (ii) with building up the capacity of Natura 2000 sites managers both at the planning and field level (either through permanent tasks or through LIFE-IP NATURA.SI activities), (iii) with enhancement of warden service for direct surveillance in nature (also foreseen in LIFE-IP NATURA.SI). All running cost of existing management bodies should be provided continuously.

Analysis of knowledge and implementation gaps should be stipulated and eliminated through capacity building and monitoring on the field. Understanding of the methods and approaches and the acceptance of the implementation of measures should be increased.

Conservation measures should be laid down according to their need for action and feasibility through systemic mechanisms and other nature conservation measures should be assessed. Where needed, land acquisition of most critical habitats should be enhanced and appropriate management established.

Contrary to the other sectors, measures for steering agricultural use are based mainly on voluntary inclusion of farmers in agri-environmental-climate payment measures (AEP measures). Payments within Natura 2000 sites facilitate farming on Natura sites regarding limitations imposed by requirements for individual Natura sites which exceed the principle of good agricultural and environmental performance. Agricultural Chamber holds a key position in communication with farmers and MOP should improve cooperation with the Chamber on raising awareness and involvement of farmers into AEP measures. Capacity building of agriculture advisory service on central and regional units of Chamber of Agriculture and Forestry of Slovenia (KGZS) for implementing adapted agricultural practices with positive effects on species/habitat types and biodiversity and for cooperation with IRSNC should be stipulated.

Capacity building and increased awareness for benefits of well preserved and managed Natura 2000 sites of local authorities (municipalities) are important in implementing their responsibilities on spatial planning, project planning and implementing of measures with positive effects on species/habitat types and biodiversity (nature based solutions). To achieve ownership over nature conservation measures for resolving the most important issues also communication and cooperation with nature protection sector especially in the initial stages of the preparation of the plans should be stipulated.

A key operational challenge is to strengthen the established organizational framework for institutional action of nature protection, in particular to respond to new and upcoming content, to strengthen the supervisory functions and capabilities of supporting professional institutions, and to seek new sources of funding (eg in EU funds and in the private sector) also for measures beyond Natura 2000. With regard to the conservation measures of biodiversity beyond Natura 2000, the importance of maintaining landscape features and the treatment of non-native species and genetic resources is further

emphasized. These are topics that need to be given further attention in the light of new international obligations and the implementation of EU common law.

Information on the status of IAS in nature must be gathered and pathways of introduction and spread addressed. Similarly as with the Natura 2000 measures; prevention, eradication and management measures for IAS and ownership over these measures should be stipulated within all sectors and also importantly, with land owners. In this view coordinated national system for addressing the IAS in accordance with the EU Regulation 1143/2014 should be established and operational.

Management bodies have sufficient information for their own work, but there is a lack of exchange of data between different organisations or the exchange requires a lot of time and effort (both in time and human resources). Additionally, there is no central repository that would allow in-time access to information. One of the solutions is construction of a national nature information system, for which a concept of a LIFE project was submitted in June 2019. It was accepted in the first phase by EC and a full proposal will be submitted in February 2020. The project plans to connect existing databases from different organisations, eliminate data duplication, and enable exchange of data and its verification. It will increase access to information to both public and private stakeholders.

Prioritization of measures to be implemented during the next MFF period

All measures are considered a priority. Measures that directly contribute to improvement of habitats in unfavourable condition or have positive influence on species with unfavourable conservation status have a greater importance and will be considered first.

List of prioritized measures to be carried out, and estimated costs for these measures

Name and short description of the measures	Type of measure*	Estimated cost in Euros (annualised)	Possible EU co-funding source
Site administration and communication with stakeholders by managers of protected areas, Institute of the Republic of Slovenia for Nature Conservation, Ministry of the Environment and Spatial Planning, Slovenian Environment Agency	Recurring	5 M – 6 M	LIFE, ERDF, ESF
Site administration and communication with stakeholders by Slovenia Forest Service	Recurring	350 000 – 500 000	LIFE, ERDF
Enhancement of warden service for direct surveillance in nature	One-off**	140 000 – 200 000	LIFE
Capacity building for preparation of nature conservation projects	One-off	245.000 - 350.000	ERDF, LIFE
Enhancement of environmental inspection	One-off**	250.000 - 400.000	LIFE, ESF
Capacity building of agriculture advisory service on central and regional units of Chamber of Agriculture and Forestry of Slovenia (KGZS) for implementing adapted agricultural practices with positive effects on species/habitat types and biodiversity and for cooperation with IRSNC	Recurring	270 000 - 360 000	EARDF, ESF, LIFE
Capacity building of nature conservation service on central and regional units of Slovenian Institute for Nature Conservation (ZRSVN) for promoting and advising adapted agricultural practices with positive effects on species/habitat types and biodiversity (nature based solutions)	Recurring	120 000 -160 000	ESF, LIFE
Capacity building of local authorities (municipalities) for spatial planning and implementing of measures with positive effects on species/habitat types and biodiversity (nature based solutions)	Recurring	0.7 M – 1 M	ESF
Planning and implementation of measures to prevent, eradicate and manage IAS	Recurring	0.8 M – 1.3 M	LIFE, ERDF, EMFF
Land acquisition	Recurring	1.5 M – 2.3 M	LIFE, ERDF
Additional measures beyond Natura 2000 (preparation and novelation of required legal acts, establishment of new protected areas, Update on the Red List of Threatened Species Policy)	Recurring	2 M – 2.5 M	LIFE, ERDF
Establishment of National nature conservation information system	One-off**	500 000 – 700 000	LIFE
Maintenance of National nature conservation information system	Recurring	150 000 - 250 000	

* indicate whether the measure is recurring or one-off

**Measures will be established through the LIFE-IP NATURA.SI or other project, then implemented as recurring measure

Expected results

Existing site management of Natura 2000 in Slovenia is a continuing process done by relevant institutions/organisations, which insures good status of Natura 2000 species and habitats in Natura 2000 sites and also outside of Natura 2000 network. Communication with stakeholders has improved (both within general population as well as professional public), that increases awareness about Natura 2000 species and habitats. Greater involvement of stakeholders and general public in preparation of nature conservation measures will enable more wholesome approach for effective solutions and increased acceptance. Access to information regarding Natura 2000 including threats and pressures is easier and more transparent; also amount of available information is increasing.

E.1.3. Monitoring and reporting

Current status and progress made so far in terms of monitoring and reporting

In Slovenia, data about species and habitat types comes from very diverse sources, for example: selected species related national monitoring, data gathered by managers of protected areas, diverse projects (either EU or nationally funded) and private or national institutions. Data are interpreted and used by either public or private institutions/companies and are used by IRSNC for obligatory national reporting under Article 17 of Habitats Directive and Article 12 of Birds Directive.

In Slovenia only some/partial monitoring schemes of selected species or habitat types were already established and not all are running regularly due to a several limiting factors: mostly due to lack of funds, lack of basic research and knowledge needed and in minor cases also lack of experts for specific groups/habitats. However, in the last decade number of monitored species increased and number of developed or improved monitoring protocols increased. So far, partial or sufficient monitoring in Slovenia exists for: beetles, butterflies & moths, amphibians, crustaceans, fishes, bats, birds, dolphins, large carnivores and non-forest habitat types and Invasive alien species (in the sea).

In order to improve knowledge about species and habitat types and to increase availability and transparency of gathered data, a development of central national monitoring scheme (NMS) is foreseen as a part of LIFE integrated project LIFE-IP NATURA.SI. An aim of preparatory action is to assess the feasibility of monitoring scheme at the beginning of the project. Here, IRSNC and MOP will prepare an overview of different missing monitoring projects and protocols that are waiting to be included in NMS. Moreover, a rough estimate of necessary funds was calculated. The list was partially updated by external experts for species and habitat types.

List of prioritized measures include three costs categories: (i) for regularly running monitoring schemes for all species with established monitoring protocols and were running up to now; (ii) monitoring of species for which monitoring protocols were designed and not implemented yet (due to lack of funding); (iii) monitoring of species for which monitoring protocols are not established (monitoring needs to be designed, protocols tested, etc.).

Further measures needed

Most groups of species or habitat types are at least partly covered by already established monitoring. However, the establishment of a more complete national monitoring scheme is foreseen, which will include (but not be limited to) list of monitoring and protocols for all Natura 2000 species. In order to be able to perform mentioned monitoring, sufficient funds need to be provided (lack of funds was one of the major factor for not performing several monitoring projects in the past). Also prioritisation of monitoring projects should be prepared to mitigate potential lack of funds. Cost estimates are provided in list of prioritized measures below.

Prioritization of measures to be implemented during the next MFF period

Continuation of the existing monitoring of species or habitats should be guaranteed. List of priority species and habitats that need to be monitored will be prepared and related monitoring projects performed in accordance with available funds.

List of prioritized measures to be carried out, and estimated costs for these measures

Name and short description of the measures	Type of measure*	Estimated cost in Euros (annualised)	Possible EU co-funding source
Monitoring of amphibians (establishment of monitoring for Annex 4 species)	One-off	30 000 – 50 000	Horizon Europe, LIFE
Monitoring of amphibians (Implementation of monitoring for Annex 2 species, for which monitoring is already established)	Recurring	15 000 – 25 000	Horizon Europe, LIFE
Monitoring of amphibians (supplement of monitoring of <i>Bombina bombina</i>)	One-off	2 000 – 3 000	LIFE, Horizon Europe
Monitoring of the olm (<i>Proteus anguinus</i>) (monitoring is not yet established)	One-off	280 000 – 450 000	Horizon Europe, LIFE
Monitoring of bats (for species, for which monitoring is not yet established - Establishment of population monitoring of <i>Vespertilio murinus</i> and <i>Eptesicus nilssonii</i>)	Recurring	5 000 – 8 000	Horizon Europe, LIFE
Monitoring of bats (full implementation of monitoring for species, for which monitoring is already established)	Recurring	85 000 – 140 000	Horizon Europe, LIFE
Monitoring of the cave beetle <i>Leptodirus hochenwartii</i> (improvement and optimisation of monitoring protocols)	One-off	23 000 - 38 000	Horizon Europe, LIFE
Monitoring of the cave beetle <i>Leptodirus hochenwartii</i> (monitoring is already established; optimisation of monitoring protocols needed)	Recurring	75 000 - 120 000	Horizon Europe, LIFE
Monitoring of beetles (implementation of monitoring for species, for which monitoring is already established with optimised & improved monitoring protocols)	Recurring	60 000 – 980 000	Horizon Europe, LIFE

Monitoring of beetles (optimisation of monitoring protocols, development of pheromone traps, baseline studies)	One-off	53 000 – 86 000	Horizon Europe, LIFE, ERDF
Monitoring of beetles (<i>Rhyodes sulcatus</i> & <i>Stephanopachys substriatus</i> for species, for which monitoring is not yet established)	Recurring	17 000 – 27 000	Horizon Europe, LIFE
Monitoring of birds - international monitoring of seabirds in the Gulf of Trieste	Recurring	86 000 – 140 000	EMFF, Horizon Europe, LIFE
Monitoring of birds (<i>Alauda arvensis</i> & <i>Saxicola rubetra</i> for which monitoring is not yet established)	Recurring	40 000 – 65 000	Horizon Europe, LIFE
Monitoring of birds (establishment and implementation of monitoring for mountain bird, forest bird species & bird of prey, decadal water bird census, etc.; monitoring is not yet established)	One-off	280 000 – 470 000	Horizon Europe, LIFE
Monitoring of birds (for species for which monitoring is already established - Monitoring of populations of selected bird species in Natura 2000 sites & Monitoring of Common Bird Species for the determination of Slovene Farmland Bird Index)	Recurring	130 000 – 200 000	EARDF, LIFE
Monitoring of butterflies (for species, for which monitoring is already established)	Recurring	85 000 – 120 000	EARDF, LIFE
Monitoring of butterflies (for species, for which monitoring is not yet established)	Recurring	70 000 – 100 000	LIFE
Monitoring of Annex 4 grasshopper species <i>Saga pedo</i> (baseline study, establishment and implementation of monitoring; monitoring is not yet established)	Recurring	8 000 – 16 000	Horizon Europe, LIFE
Monitoring of crayfish species (<i>A. pallipes</i> , <i>A. torrentium</i> - already established)	Recurring	26 000 – 42 000	LIFE
Monitoring of crayfish species (<i>A. astacus</i> - not yet established)	Recurring	9 000 – 15 000	LIFE, Horizon Europe
Monitoring of dolphins (monitoring is already established)	Recurring	45 000 – 73 000	EMFF, LIFE
Monitoring of dragonflies (establishment of monitoring for <i>Aeshna viridis</i> , <i>Coenagrion ornatum</i> , <i>Cordulegaster heros</i> & <i>Leucorrhina caudalis</i> and <i>Gomphus flavipes</i>)	One-off	10 000 – 16 000	LIFE, Horizon Europe
Monitoring of dragonflies (establishment of monitoring protocols for <i>Leucorrhinia pectoralis</i> & <i>Ophiogomphus cecilia</i>)	One-off	5 000 – 7 000	LIFE
Monitoring of dragonflies (implementation of monitoring for 5 species)	Recurring	25 000 – 30 000	LIFE
Monitoring of European beaver <i>Castor fiber</i> (baseline study, establishment and implementation of monitoring; monitoring is not yet established)	Recurring	17 000 – 27 000	LIFE
Monitoring of European otter (<i>Lutra lutra</i>) for which monitoring is not yet established	Recurring	12 000 – 20 000	Horizon Europe, LIFE
Monitoring of fish (for species, for which monitoring is already established)	Recurring	48 000 – 78 000	LIFE
Monitoring of fish (for species, for which monitoring is not yet established)	Recurring	60 000 – 100 000	LIFE
Monitoring of large carnivores (monitoring is already established)	Recurring	450 000 – 550 000	LIFE
Monitoring of molluscs (establishment of monitoring for <i>Vertigo geyeri</i> , <i>Vertigo angustior</i> , <i>Helix pomatia</i> , <i>Microcondylaea compressa</i> , <i>Unio crassus</i> , <i>Anisus vorticulus</i> , <i>Theodoxus prevostianus</i> , <i>Unio elongatulus</i>)	Recurring	37 000 – 60 000	LIFE
Monitoring of molluscs (establishment of monitoring for <i>Congeria jalzici</i>)	One-off	17 000 - 27 000	LIFE
Monitoring of molluscs (establishment of monitoring for <i>Congeria jalzici</i>)	Recurring	13 000 - 21 000	
Monitoring of sea molluscs (<i>Pinna nobilis</i> & <i>Litophaga litophaga</i>)	Recurring	5 000 – 8 000	EMFF, LIFE
Monitoring of mosses (monitoring is not yet established)	One-off	16 000 – 26 000	LIFE, Horizon Europe
Monitoring of plants (for species, for which monitoring is not yet established)	Recurring	52 000 – 85 000	Horizon Europe, LIFE
Monitoring of reptiles - <i>Caretta caretta</i>	Recurring	114 000 – 185 000	EMFF, LIFE
Monitoring of reptiles - establishment of monitoring for <i>Emys orbicularis</i>	One-off	5 000 – 8 000	LIFE, Horizon Europe
Monitoring of reptiles (implementation of monitoring for 16 species after monitoring protocols are prepared and monitoring is established)	Recurring	16 000 – 26 000	LIFE
Monitoring of habitat type caves not opened to public: HT8310 (monitoring is not yet established)	One-off	104 000 - 170 000	
Monitoring of habitat type caves HT8310 (monitoring is not yet established)	Recurring	77 000 – 125 000	Horizon Europe, LIFE
Monitoring of sea habitat types (HT 1110, HT 1120, HT 1170)	Recurring	20 000 – 33 000	EMFF, LIFE
Monitoring of non-forest habitat types (not yet established)	Recurring	272 000 – 442 000	EARDF, Horizon Europe, LIFE
Mapping of non-forest habitat types (Mapping of initial situation on the field)	Recurring	50 000 – 90 000	Horizon Europe, LIFE
Monitoring of forest habitat types (HT 9110, 9180*, 91D0*, 91E0*, 91F0, 91K0, 91L0, 91R0, 9340, 9410, 9420, 9530* - monitoring is not yet established)	Recurring	170 000 – 250 000	Horizon Europe, LIFE
Monitoring of invasive alien species (monitoring is not yet established)	Recurring	80 000 – 120 000	Horizon Europe, LIFE
Monitoring of invasive alien species in the sea (monitoring is already established)	Recurring	40 000 – 60 000	EMFF, LIFE

Priority measures coming out of the Natura 2000 Management programme 2021-2027, that can't yet be defined	Recurring	50 000 –100 000	
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* indicate whether the measure is recurring or one-off

**Measures will be implemented or established through the LIFE-IP NATURA.SI, later implemented as recurring measure

Expected results

Information gathered from monitoring will provide sufficient data on the status of Natura 2000 species and habitats, both inside SACs and SPAs and also outside Natura 2000 sites including also information on selected threats and pressures such as invasive alien species. National monitoring scheme will be upgraded. Due to available funds it might not be possible to perform all monitoring projects, however at least priority species and habitats should be covered. Knowledge gained should reflect in cost-effective measures that help to achieve favourable reference values for Natura 2000 species and habitats.

E.1.4. Remaining knowledge gaps and research needs

Current status

As mentioned in chapter above, Slovenia is in process of establishing national monitoring scheme. However, established monitoring gives us only a part of information on species and habitat types listed in Birds Directive and Habitats Directive. In some cases additional species related research is needed or existing knowledge needs to be improved. Nowadays, we can gather better or additional information, which is available due to the emerging of new technologies. But still, there are some species and habitat types where we lack knowledge for establishing a comprehensive monitoring or preparing (and more important) tailor or pinpoint conservation measures more effectively.

The Slovenian Research Agency (ARRS) as an independent public funding organisation performs tasks relating to the National Research and Development Programme and creation of European Research Area. The Agency selects and finances research and infrastructure programmes that provide a public service in the research field. Target research programmes (referred to the Slovenian abbreviation of CRP) represent a system for inter-sectoral cooperation in planning and implementing networked R&D projects for specific areas of public interest. CRP in cooperation with the Agency contributes to setting and implementing strategic development objectives for Slovenia in cooperation with other ministries. 4 research projects that are connected with Natura 2000 species were funded by CRP, one of them is titled "The design of monitoring of the conservation status of minor Natura 2000 forest habitat types in Slovenia" (2014 – 2017).

There is not enough resources for financing all the research and monitoring for the knowledge gaps through national funding, and EU funding sources (LIFE, Horizon2020, Interreg) do not provide financing needed for all the baseline studies.

Knowledge gaps were identified by species and habitat type's experts and gathered by MOP.

Further measures needed

Both increase of information and information sharing needs to be improved in order to enhance performance of measures. First part can be achieved by employing new technologies, which can be used in species related research (for example defining the population baseline for less known species or research of particular developmental stages of bugs). Research should be stipulated in every field where there is a lack of basic knowledge on priority species or habitat types. This could reduce costs of data gathering through monitoring and simultaneously increase amount and quality of gathered information for better management of Natura 2000 sites. Research should be stipulated in every field where there is a lack of basic knowledge on priority species or habitat types. Subterranean habitats and cave species are as such, subterranean habitats are highly specific environment with limited accessibility and there is a critical lack of basic knowledge which is crucially needed to plan effective measures for conservation

Prioritization of measures to be implemented during the next MFF period

All measures listed below are considered as priority. Listed measures will be reviewed and prioritised through preparation of Natura 2000 Management Programme (2021-2027).

List of prioritized measures to be carried out, and estimated costs for these measures

Name and short description of the measures	Type of measure*	Estimated cost in Euros (annualised)	Possible EU co-funding source
Baseline surveys for qualifying species in individual Natura 2000 sites where data gaps are most evident and critical	Recurring	150 000 – 200 000	Horizon Europe, LIFE
Amphibian species related research	One-off	75 000 – 130 000	Horizon Europe, LIFE

Proteus anguinus related research (identification and evaluation of parasites & health status of populations...)	One - off	60 000 – 100 000	Horizon Europe, LIFE
Bat species related research (baseline situation in 800 castles and mansions and 1000 churches where the bat inventory has not yet been conducted)	One-off	20 000 – 30 000	Horizon Europe, LIFE
Beetles species related research	One-off	35 000 – 60 000	Horizon Europe, LIFE
Bird species related research (determining feeding sites of <i>Larus ridibundus</i> , research on the impact of sports and recreational activities on water birds in Lake Ptuj)	One-off	30 000 – 45 000	Horizon Europe, LIFE
Bird species related research (effectiveness and suitability of agri-environmental conservation measures on selected species of birds, determining the causes of the decline; survival of litter in grassland bird species; etc)	One-off	368 000 – 598 000	Horizon Europe, EARDF, LIFE
Bird species related research (identification of migration corridors; determination of most important wintering areas; development of bird indexes for Natura 2000 sites)	One-off	145 000 – 235 000	Horizon Europe, LIFE
Bird species related research for forest bird species, birds of prey and owls	One-off	110 000 – 180 000	Horizon Europe, LIFE
Butterfly species related research (study of larval stage ecology in Slovenia; distribution of the species and its ecology; impact of floods on larval stages and meadow meta-population structures; suitable management study...)	One-off	80 000 – 130 000	EARDF, Horizon Europe, LIFE
Caves (HT_8310) – establishing baseline situation	One-off	85 000 – 140 000	Horizon Europe, LIFE
Crayfish species related research (impact of water management & water use on species)	One-off	90 000 – 150 000	Horizon Europe, LIFE
Crayfish plague related research (research of presence, vectors, eDNA sampling methods, identification of infectious foci, establishment of a monitoring scheme of crayfish plague)	One-off	30 000 – 47 000	Horizon Europe, LIFE
Designing of the Red List methodology (Development of a method for making a red list, with objective criteria, with results comparable between different animal groups)	One-off	8 000 – 13 000	Horizon Europe, LIFE
Development of mortality monitoring of protected vertebrate species	Recurring	20 000 – 32 000	Horizon Europe, LIFE
Dragonflies related research - utilization of endangered specialist peat-bog odonate species (<i>Aeshna juncea</i> , <i>Leucorrhinia dubia</i> , <i>Somatochlora arctica</i>), characteristic for type HT 7110* Active raised bogs (according to Interpretation Manual of European Union Habitats), in monitoring of distribution and conservation status of this priority habitat type. Duration: 2 years cycle	Recurring	6 000 – 11 000	Horizon Europe, LIFE
Dragonflies related research: <i>Coenagrion ornatum</i> - research of ecology, metapopulation structure and habitat connectivity in western, central and eastern Slovenia. Duration: 3 years	One-off	6 000 – 17 000	Horizon Europe, LIFE
Dragonflies related research: <i>Cordulegaster heros</i> - study of ecological demands, larval life-cycle, limiting environment factors and metapopulation structure; Duration: 3 years	One-off	6 000 – 17 000	Horizon Europe, LIFE
Dragonflies and crayfish related research: influence of predation of invasive allochthonous crayfish species <i>Pacifastacus leniusculus</i> on larval populations of <i>Ophiogomphus cecilia</i> - impact of invasive species on qualifying Natura 2000 species in Mura and Drava rivers. Duration: 2 years	One-off	6 000 – 11 000	Horizon Europe, LIFE
European otter (<i>Lutra lutra</i>) related research	Recurring	17 000 – 28 000	Horizon Europe, LIFE
Fish species related research (Analysis of the impacts of existing barriers on Natura 2000 fish species; IAS impact on fish and fish habitat)	Recurring	16 000 – 26 000	EMFF
Fish species related research (Development the method for sampling fish species of large rivers and depths for species which traditional methods are not reliable)	One-off	34 000 – 55 000	LIFE, Horizon Europe
Fish species related research (population size and structure studies, distribution, abundance, genetic and other research needed for improved management of species)	One-off	0.6 M – 1 M	EMFF, ERDF, LIFE
Forest habitat types related research (mapping, remote sensing, development of mapping protocols)	One-off	0.6 M – 1 M	Horizon Europe, LIFE
Large carnivores related research	Recurring	60 000 – 100 000	Horizon Europe, LIFE
Mapping and assessing ecosystem services based on existing knowledge and additional ecosystem mapping.	One-off	40 000 – 65 000	ERDF, LIFE
Mapping of non-forest habitat types with remote sensing (mapping & protocol testing)	One-off	60 000 – 100 000	Horizon Europe, LIFE
Improving the quality of data about the area of species suitable habitat / about the area of habitat type (HT 7230, HT 7220, HT 7210, HT 7150)	One-off	17 000 – 28 000	ERDF, LIFE
Mollusc species related research (<i>U. crassus</i> , <i>U. elongatulus</i> , <i>M. Bonellii</i> , <i>A. anatina</i> , <i>A. cygne</i>) (lethal temperatures, host species, water quality impact...)	One-off	50 000 – 80 000	Horizon Europe, LIFE
Reptile species <i>Caretta caretta</i> related research (Identification of priority measures for protection in the Slovenian sea)	Recurring	35 000 – 55 000	Horizon Europe, EMFF, LIFE
Reptile species <i>Elaphe quatuorlineata</i> related research	Recurring	30 000 – 50 000	Horizon Europe, LIFE
Reptile species <i>Emys orbicularis</i> related research	Recurring	200 000 – 350 000	Horizon Europe, LIFE, ERDF
Reptile species related research (Annex 4 species)	Recurring	350 000 – 400 000	Horizon Europe, LIFE, ERDF
Saproxyllic Beetles and forest bird related researches (impact of forest disasters, deadwood reference values)	One-off	70 000 – 120 000	Horizon Europe, LIFE
Comprehension and quantification of erosion rates in different landscapes and land use types in Natura 2000 sites in Slovenia	Recurring	120 000 - 195 000	LIFE, EARDF, HORIZON EUROPE
Establishment of registry of man-made structures contributing to biodiversity and its assessment in different Natura 2000 sites within the Mediterranean region	One-off	7 000 –10 000	LIFE, EARDF, HORIZON EUROPE

* indicate whether the measure is recurring or one-off

**Measures will be implemented or established through the LIFE-IP NATURA.SI, later implemented as recurring measure

Expected results

Knowledge on Natura 2000 species and habitats is up to date and available upon request. Gathered information contributes to better understanding and developing of measures and policies. Due to better availability of information cooperation between different sectors is enhanced. Measures are prepared and performed in cost effective way, which leads to improvement of species and habitat types. Improved information sharing between different organisations also increases communication and understanding between different sectors, which results in interdisciplinary approach to preparation of nature conservation measures (enhanced efficiency, reduced costs and time spend, better social cooperation).

E.1.5. Natura 2000-related communication and awareness raising measures, education and visitor access

Current status

Communication, awareness raising measures, education regarding Natura 2000 in general is a task of the Institute of the Republic of Slovenia for Nature Conservation. The work of IRSNC is guided by MOP through setting the frames for yearly work programs and financing from the state budget.

15 % of tasks (and budget) of IRSNC according to the yearly work programme is dedicated to communication tasks, education, public awareness and professional oversight which include:

- Communication regarding Natura 2000 sites and other nature conservation content,
- Participation in the training of customs and supervisory authorities, warden service and other training in nature conservation;
- nature protection supervision in the field;
- Raising public awareness on the importance of nature conservation (preparation and dissemination of printed, electronic and other materials, active participation in organizing public events...).
- Promotional and informative markings of natural values in nature (information and routing boards and basic accessibility infrastructure).

Since a third of Slovenia's Natura 2000 sites overlap with protected areas, awareness raising measures and visitor access activities in those sites are mostly carried out by management bodies protected areas. The work of management bodies of protected areas is supervised by MOP through setting the frames for yearly work programs and financing from the state budget.

25% of tasks (and budget) of protected areas is dedicated to set of activities connected to the duties of arranging visitation, communication and awareness rising is set in work programs. Those tasks are:

- Providing a visit that is relevant in terms of nature and visitor protection (coordinating visit, scheduling, guiding visitors, directing...)
- Installation and maintenance of infrastructure for visiting protected areas, developing information centres, observatories and other additional infrastructure for visitors
- Ensuring the visibility of the protected area and raising public awareness (preparation and dissemination of printed, electronic and other materials, active participation in organizing public events...)

Within protected areas there are organized several events, workshops and working groups for local stakeholders (representatives of protected areas are sometimes members of different working groups of stakeholders). They employ rangers who are informing and educating locals and visitors. Some public bodies managing protected areas have good connections with local schools or network of schools. Since 2017, Community of Parks is organizing common web activities for schools. Within protected areas there are offered regular and professional guided tours and established visitor infrastructure with info points and thematic paths.

Additional communication, awareness raising and education activities on Natura 2000 are performed by several different institutions: Slovenia Forest Service and the Slovenian Forestry Institute regarding Natura 2000 and invasive species in forests, Fisheries Research Institute of Slovenia regarding Natura 2000 and fish, water ecosystems and invasive alien species in waters and few other institutions each on their own field.

Natura 2000-related communication and awareness raising activities are also financed through different state (NGO tenders, national green fund) and EU financed projects (program LIFE, LEADER, Cohesion fund). Activities, such as regular guiding in protected areas and constant cooperation with local stakeholders or schools are in those cases a part of the project. When the project ends sometimes these activities of communication and education cannot continue.

Further measures needed

Broadly, further measures needed for management planning of Natura 2000 are:

- Measures for visitor management on Natura 2000 areas & protected areas
- Communication and awareness raising
- Education activities on Natura 2000 and biodiversity
- Communication capacity building
- Communication planning, implementation and monitoring of effectiveness.

Tourist visits in Slovenia have been increasing every year and this also increased the pressure to the Natura 2000 sites and protected areas. Therefore, the priority activities need to include implementation (and in some cases the development) of visitors management plans to preserve natural values. Very important is also arranging and maintaining a tourism infrastructure that contributes to: (i) a focused and controlled visit; (ii) raising awareness of local stakeholders, tourism providers and others about the species and their needs for nature conservation; (iii) leaving quiet zones.

Further measures should also be focused on activities and events among different target groups for raising awareness of non-native invasive species and local biodiversity.

In Slovenia, orientation to direct personal communication, such as stakeholder discussions, lectures, field campaigns, guided tours has provided above average public awareness and awareness at both EU and national levels. The activities carried out within protected areas or projects, activities of non-governmental organizations and the IRSNC and SFS contributed to this. In recent years, the focus of outreach activities has shifted to projects co-financed by EU funds and programs. However, awareness raising activities undertaken on a project basis need to be adapted to the long-term plans in the future in collaboration with public bodies, public institutions and non-governmental organizations.

Another further measure is also strengthening the educational and awareness raising skills of public services working in the field of biodiversity conservation. Also general public should be more educated about the links between climate change and their impacts on ecosystems and biodiversity.

Communication and awareness raising activities that should be carried out are: (i) constant communication with surrounding municipalities, stakeholders (farmers, land owners, foresters, hunters, fishermen, media, tourism sector, inhabitants etc.); (ii) professional lectures, workshops, (iii) preparation of guidelines to reduce the negative impact of human activities on biodiversity, (iv) organized campaigns on biodiversity conservation (different themes such as actions for removal of non-native invasive species, helping amphibians to cross the roads during spring migrations...).

Education activities that should be carried out are: collaboration with local schools – Community of Parks school network, periodical education activities for local touristic guiding, professional lectures and training for local farmers on specific species (as one off the activity), compilation of information materials, training and involvement of volunteers etc.

Prioritization of measures to be implemented during the next MFF period

All the above listed measures are considered as priority; measures that directly contribute to the improvement of habitats with unfavourable conservation status or have a positive influence on endangered species have a greater importance and will be considered first.

List of prioritized measures to be carried out, and estimated costs for these measures

Name and short description of the measures	Type of measure*	Estimated cost in Euros (annualised)	Possible EU co-funding source
Measures for visitor access of Natura 2000 areas & protected areas	One-off	30 000 – 50 000	LIFE, ERDF,
Measures for visitor access of Natura 2000 areas & protected areas	Recurring	680 000 – 1.2 M	
Communication and awareness raising	One-off	180 000 – 250 000	LIFE, ERDF, MEDIA - Creative Europe
Communication and awareness raising	Recurring	560 000 – 910 000	
Education activities on Natura 2000 and biodiversity	One-off	100 000 – 150 000	LIFE, ERDF
Education activities on Natura 2000 and biodiversity	Recurring	480 000 – 780 000	
Communication capacity building	One-off	50 000 – 100 000	LIFE
Communication planning, consultation for implementation	One-off	200 000 – 300 000	LIFE, MEDIA - Creative Europe
Promoting responsible ecotourism in case of large carnivores	Recurring	10 000 - 16 000	LIFE

* indicate whether the measure is recurring or one-off

Expected results

Above stated activities will provide:

- Raised awareness and level of information on Natura species, habitat types and Natura 2000 sites.
- Established communication channels and tools related to Natura 2000 sites.
- Active involvement and building up self-confidence of farmers, with a special emphasis on young farmers, through project activities like “business” panels, where they can exchange experience in first hand.
- Active communication with inhabitants of Natura 2000 sites (workshops, lectures, exhibitions, involvement as volunteers in different activities).
- Better knowledge of the existence of Natura 2000 by the public.
- Introduction of an all Slovenian “Nature conservation success’ platform”, which will act as a networking conference, promotion of best practices in Slovenia and wider, as an opportunity for creating wider and a strong base of supporters of nature conservation in Slovenia by enabling them to show their results and step forward and have their say.

E.1.6. References for horizontal measures and administrative costs related to Natura 2000

Information for horizontal measures and administrative costs related to Natura 2000 was provided by following organisations:

MOP	Ministry of the Environment and Spatial Planning
IRSNC	Institute of the Republic of Slovenia for Nature Conservation
DRSV	Slovenian Water Agency
MKGP	Ministry of Agriculture, Forestry and Food
SKZG	Farmland and Forest Fund of the Republic of Slovenia
SVRK	Government Office for Development and European Cohesion Policy
SIDG	Slovenski državni gozdovi d.o.o. company
GIS	The Slovenian Forestry Institute
ZZRS	The Fisheries Research Institute of Slovenia
ZGS	Slovenia Forest Service
ARSO	Slovenian Environment Agency
CKFF	Centre for Cartography of Fauna and Flora
UL	University of Ljubljana
Lutra	Lutra, Institute for Conservation of Natural Heritage
NIB	National Institute of Biology
NIB (MBP)	Marine Biological Station Piran
UP	University of Primorska
ZRC SAZU GIAM	Research centre of the Slovenian Academy of Sciences and Arts (Anton Melik Geographical Institute)
DOPPS	Birdlife Slovenia

and managing authorities of protected areas:

Triglav National Park, Kozjansko Regional Park, Notranjska Regional Park, Škocjan Caves Regional Park, Goričko Nature Park, Ljubljansko barje Nature Park, Kolpa Nature Park, Strunjan Nature Park, Sečovlje Salina Nature Park, Logar Valley Nature Park, Debeli rtič Nature Park, Seasonal Lakes of Pivka Nature Park, Tivoli, Rožnik and Šiška Hill Nature Park, Škocjan zatok Nature Reserve.

PAF was presented to the public on 23th of January 2020 where 26 organisations participated. Later on following organisations gave written comments:

IRSOP	Inspectorate for the Environment and Spatial Planning
UL	University of Ljubljana
NIB	National Institute of Biology
ZRC SAZU GIAM	Research centre of the Slovenian Academy of Sciences and Arts (Anton Melik Geographical Institute)
ZGS	Slovenia Forest Service
MKGP	Ministry of Agriculture, Forestry and Food
IRSNC	Institute of the Republic of Slovenia for Nature Conservation
Zavod Symbiosis, so.p.	Institute symbiosis social enterprise
NaravaNarave d.o.o.	https://www.naravanarave.com/

E.2 Site-related maintenance and restoration measures, within and beyond Natura 2000

E.2.1. Marine and coastal waters

Current status of habitats and species, conservation measures taken until now and their impact so far, remaining pressures and threats

Among the marine and coastal waters habitat types listed in Annex 1 of the Habitats Directive, twelve (12) of them are occurring in Slovenia.

HT that by MAES typology fall in Coastal or/and Marine inlets and transitional waters:

- 1110 Sandbanks which are slightly covered by sea water all the time
- 1120 Posidonia beds (*Posidonium oceanicae*)
- 1130 Estuaries
- 1140 Mudflats and sandflats not covered by seawater at low tide
- 1150 Coastal lagoons
- 1170 Reefs
- 1310 Salicornia and other annuals colonizing mud and sand
- 1320 Spartina swards (*Spartinion maritimae*)

HT that by MAES typology fall in Sparsely vegetated land

- 1210 Annual vegetation of drift lines
- 1240 Vegetated sea cliffs of the Mediterranean coasts with endemic (*Limonium* spp.)
- 1410 Mediterranean salt meadows (*Juncetalia maritimi*)

HT that by MAES typology fall in Grassland

- 1410 Mediterranean salt meadows (*Juncetalia maritimi*)

HT that by MAES typology fall in Heathland and shrub

- 1420 Mediterranean and thermo-Atlantic halophilous scrubs (*Sarcocornetea fruticosi*)

The northern Adriatic constitutes a particular biogeographical sector due to its northern location, superficial depth, and important nutrient discharges from rivers. Extensive seagrass meadows, composed of four of the five species present in the Mediterranean basin have been observed in this region; the lack of rocky substrate and the high sedimentation, however, seem to be unable to support extensive coralligenous assemblages (PERGENT 2009).

The overall status of the marine and coastal waters species and habitat types for which Natura 2000 sites were designated in Slovenia could be considered as favourable altogether.

Most marine and coastal habitats (listed in Annex 1 of the Habitats Directive) are included in protected areas, Natura 2000 sites or are considered as natural values and protected by legislation. In all cases the possible interventions or/and activities should take into account the FCS. The population of the pen shell is increasing while picking date shells *Pinna nobilis* seems not to be a threat anymore. However regards with the pen shell there is a threat of mass mortality caused by a protist parasite *Haplosporidium pinnae* that has already effected populations in Adriatic. Special attention should be given for monitoring of the status of the population and rescue activities and if needed repopulation activities along with the IUCN guidance. There are also elements of concern or uncertainty mainly linked to the absence of data in the case of the loggerhead turtle and linked to the presence of PCB in bottlenose dolphins in concentrations that are above the toxicity threshold.

Only habitat 1320 Spartina swards (*Spartinion maritimae*) is considered as unfavourable-inadequate. Additionally, three habitats Estuaries (HT 1130), Reefs (HT 1170) and Spartina swards (HT 1320) reported under the "structures and functions" as being currently in unfavourable-inadequate condition, also their predictions four future evolution are considered as unfavourable-inadequate, therefore overall status for these three habitat types is considered as unfavourable-inadequate. The inadequacy of the overall status of these three habitat types (1130, 1170 and 1320) is due to the lack of appropriate measures that would address anchoring in the case of HT 1170 and the absence of needed rehabilitation interventions in the case of HT 1130 and HT 1320. Assessments of habitat status are summarizing from the most recent available report on the conservation of habitats and species under Habitats Directive ("Article 17 report" period 2013-2018) provided from IRSNC.

Measures needed to maintain or restore favourable conservation status

Although the overall status of habitats is favourable, there are threats that need to be addressed. The habitat Sandbanks which are slightly covered by sea water all the time (HT 1110) is threatened by maintenance and potential construction of marine and inland water shipping lanes, transport corridors or coastal infrastructure for anchorage of ships and vessels

(industrial, commercial) including hydrological and morphological modifications for transport (e.g. canalisation, water deviation, barriers and locks, dredging and desilting of waterways for navigational purposes).

In marine and coastal waters habitats, sports, tourism and leisure activities outside the urban and recreational zones itself and sport and leisure structures outside the urban or recreational areas represents a significant threat to these habitats as well. Additional threat represent also activities connected with development and maintenance of recreational coastal areas and beach resorts such as levelling of dunes morphology, beach cleaning (also with mechanical vehicles), beach nourishment, human trampling and over use, construction of buildings connected to the seaside bathing establishments and marine/beach litter deposition. Along with these there is a problem from different activities and structures related to residential or recreational areas, industrial or commercial activities and structures that generate noise, light, heat or other forms of pollution. There is also a discharge of urban waste water (excluding storm overflows and/or urban run-offs) generating pollution to surface or ground water. Besides these there is also professional and recreational marine fishing and shellfish harvesting causing increased mortality, reduction of species and/or prey populations and disturbance to species therefore causing physical loss and disturbance of seafloor habitats. In the last years increased pressure from the extreme weather effects caused by the climate change influenced the coastal Natura 2000 habitats. It is foreseen that this catastrophic events will increase in the future, therefore adaptation measures should be put in place where appropriate. Preparation of effective conservation measures (determination and or monitoring the size of the marine and coastal water habitats area for targeted management measures types, banning of anchoring, legal protection, establishment of moorings, nature protection supervision) should be stipulated.

In other areas modification of hydrological flow can cause collapse of terrain or flooding's which can also be a natural process, where natural flooding causes e.g. loss of nests of species nesting on the ground or in emergent vegetation along rivers, in marshes and low-lying areas. Restoration of costal habitat types up to 200 m in length for eg. *Spartina* swards (*Spartinion maritimae*) (HT 1320) should be implemented.

Restoration and maintenance of saltpans through maintenance of earth structures and saltwater infrastructure and management of the water regime should be implemented regularly. Restoration of the costal habitat types with and removal of accumulated waste from Mediterranean salt meadows (*Juncetalia maritimi*) should also be stipulated.

Farming is present in a large part of estuaries (HT 1130), thus application of synthetic (mineral) fertilisers on agricultural land and use of plant protection chemicals in agriculture (e.g. pesticides, fungicides, growth retardants, hormones, seed coatings etc.) can damage this habitat.

Improving the management efficiency of the marine and coastal protected areas, the implementation of the Marine Environment Management Plan (according to the MSFD) as well as the rehabilitation of the site with habitats 1130 and 1320, are the most important tasks in the coming years to assure the FCS of the habitat types and species for which Natura 2000 sites were designated. Of crucial importance is also the drafting of the Maritime Spatial Plan.

Prioritization of measures to be implemented during the next MFF period

Although all measures are considered as priority, measures that directly contribute to the improvement of habitats with unfavourable conservation status or measures that have a positive influence on endangered species have a greater importance and will be considered first.

List of prioritized measures to be carried out, and estimated costs for these measures

- within Natura 2000 sites designated for the targeted habitats and species

Name and short description of the measures	Type of measure*	Target (Unit & quantity)	Estimated cost in Euros (annualised)	Possible EU co-funding source
Determination and monitoring the size of the marine and coastal water habitats for targeted management measures	One-off	1 000 ha	2 000 – 3 000	EMFF
Restore and maintain saltpans, maintain earth structures (without changing the area of the habitat) and saltwater infrastructure; manage the water regime.	Recurring	700 ha	480 000 – 780 000	
Restore the habitat type up to 200 m in length – e.g. <i>Spartina</i> swards (<i>Spartinion maritimae</i>) (HT 1320)	One-off	0.5 – 1.0 hh	17 000 – 30 000	EMFF
Removal of accumulated waste from Mediterranean salt meadows (<i>Juncetalia maritimi</i>) HT 1410	One-off	32 000 m ³ of material	280 000 – 470 000	LIFE
Indemnities for contractual protection – e.g. removing woody plants and invasive alien species – Mediterranean salt meadows (<i>Juncetalia maritimi</i>) HT 1410	Recurring	2 times	2 000 – 3 000	
Conservation actions for (preparation & implementation: banning of anchoring, establishment of moorings) e.g. HT 1110, HT 1120, HT 1170	One-off	Baseline document	1 000 – 2 000	EMFF

		& draft legal act		
Conservation actions (set baseline situation, legal protection of the areas) for e.g. HT 1240, HT 1210	One-off	Baseline document & draft legal act	2 000 – 3 000	ERDF
Inspection for preserving Natura 2000 sites (e.g. HT 1130, HT 1210, HT 1240)	Recurring		12 000 – 20 000	EMFF, ERDF
Monitoring and evaluation of increased human-induced erosional processes that affect the stability of natural habitats within flysch cliffs in 4 Natura 2000 sites: Piranski klif (SI3000247, Med Strunjanom in Fieso (SI3000307, Med Izolo in Strunjanom - klif (SI3000249, and Debeli Rtič (SI3000243)	Recurring		36 000 - 58 000	ERDF, HORIZON EUROPE
Priority measures coming out of the Natura 2000 Management programme 2021-2027, that can't yet be defined	Recurring		50 000 –100 000	

* indicate whether the measure is recurring or one-off

Expected results for targeted species and habitat types:

- Marine and coastal waters are in an optimal state.
- Improvement on people's awareness on fragility and preservation of habitats in question.
- Restoration of natural shores, salt meadows, saltpans and other natural habitats.
- Detailed maps of habitat types developed
- Improved management efficiency of the marine and coastal protected areas
- Better water quality, new sewage system and land use that does not decrease the water quality. Agricultural use of land is optimal to natural state of habitats.
- Better nature protection supervision and better execution of legislation regarding nature protection.

Expected results (other benefits):

- Raised awareness of fishermen, tourists, visitors, farmers and other public of the fragility of these habitats and importance of their preservation.
- Improvement of long-term tourism is expected.
- Measures will contribute to the overall protection of biodiversity, enhancement of ecosystem services, mitigation and adaptation to climate change.

E.2.2. Heathlands and shrubs

Current status of habitats and species, conservation measures taken until now and their impact so far, remaining pressures and threats

Amongst the heathlands and shrubs habitat types listed in Annex 1 of the Habitats Directive three (3) are occurring in Slovenia. They are depending on an active management through agricultural or other practises (e. g. grazing or mowing). These HT are listed below:

- 4060 Alpine and Boreal heaths
 4070 Bushes with *Pinus mugo* and *Rhododendron hirsutum* (*Mugo-Rhododendretum hirsuti*)
 5130 *Juniperus communis* formations on heaths or calcareous grasslands

All three habitats are reported as being currently in a favourable conservation status by recent report on the conservation status of habitats and species under Habitats Directive ("Article 17 report" of 2018) provided by IRSNC. The "structures and functions" criterion for these three habitat types has been assessed as favourable. Although the status is favourable and the future prospects are also favourable, a lot still has to be done to maintain those habitats in a good healthy condition and to prevent their degradation.

Also the total favourable reference value of the area coverage is approximately equal to current value (based on the "area" criterion in the Article 17 report) for heathlands and shrubs. Despite the status of the area, additional efforts are required to optimize their management regime at least in some of the areas currently covered by these habitats.

In habitats Alpine and Boreal heaths (HT 4060) and in Bushes with *Pinus mugo* and *Rhododendron hirsutum* (*Mugo-Rhododendretum hirsuti*) (HT 4070) quite a huge conflict comes from tourism, sport and leisure activities outside the urban and recreational zones (e.g. outdoor sports, leisure aircrafts, drones, human trampling, wildlife watching). Furthermore additional threat in HT 4060 represents insufficient grazing or under grazing that causes, for example, changes in species composition or extensive grazing in inappropriate habitats like meadows or bogs. In areas covered with HT 4070 there is also a skiing resort which with additional creation and development of sport and leisure structures outside the urban or recreational areas (e.g. building of the ski lifts, cable cars) further endangers the habitat. In this habitat there is also a big

pressure for conversion of natural and semi-natural non-agricultural habitats (semi-natural forests) and non-agricultural habitats of species targeted by the nature directives into agricultural land (pastures). This pressure does not relate only to land use changes that occurred during the reporting period but it refers also to instances where continuing the agricultural use of originally non-agricultural habitat prevent the latter from being restored (in case of land use conflicts between agriculture and nature conservation).

While in habitats *Juniperus communis* formations on heaths or calcareous grasslands (HT 5130) there is quite an opposite threat. The problem here is the abandonment of traditional agricultural practices in grasslands such as cessation of mowing or abandonment of traditional pastoral systems like summer grazing in mountain areas. Therefore changes in a species composition due to natural succession are inevitable (primary succession related to natural siltation of succession after natural disturbances). Furthermore in these habitats natural fires are also a big hazard and an additional threat.

Therefore, most of previous measures taken for these habitats include agri-environment schemes and non-productive investments under the regional Rural Development Programme where most of the effort was so far put into actively managed grazing regime. These measures have already raised the surface of heathlands and shrubs within the Natura 2000 network, but additional measures are needed to reach favourable conservation status, mainly to improve their structures and functions.

Several species listed on the annexes of the Habitats Directive and birds listed in Bird directive are living and breeding in these habitats.

Measures needed to maintain or restore favourable conservation status

Active management measures are required to maintain and improve management, structures and functions of the following areas covered by Annex I Heathlands and shrubs Therefore, integration of direct nature protective measures in spatial planning and in forest planning should be made, where inspectorate integration in the control of execution of nature protected processes will be an after work (costs integrated in chapter E.1.2).

Extra attention is needed on managing border line areas of forest and pastures, especially on treeline areas overgrown with *Pinus mugo* and in areas where forest is clear cut for managing or changing habitats. Accordingly to previous directions, previous measures taken for heathlands and shrubs included agri-environment schemes and other investments under the regional Rural Development Programme where most of the effort was put in actively optimizing management of grazing regime. These measures need to boost their effectiveness. Moreover, additional control of agri-environmental schemes is needed, especially regarding overgrowing of extensive mountain pastures and restrictions for mowing before certain time limits on one side and overgrazing on the other side to overall achieving nature protective goals. Along with this additional emphasize is needed to ensure cross compliance of different standards to be met by farmers for cultivating land (costs integrated in chapter E.1.2).

Furthermore, recreational mountaineering and climbing is becoming a major problem in these areas, because of sheer number of visitors and their poor knowledge about nature. Consequently, managing of these areas involves communication efforts to inform and educate mountaineers, visitors, all the recreational users so they will either recreate appropriately or they will recreate in areas suitable for their recreational activity (costs integrated in chapter E.1.5).

Field survey and digital mapping of habitats to gain additional information where needed should be done (costs integrated in chapter E.1.3 and E.1.4). There is also a need for preparing legislation and permissions for clear cutting of areas overgrown with *Pinus mugo* (HT 4060 and HT 4070) (costs integrated in chapter E.1.2).

Prioritization of measures to be implemented during the next MFF period

Although all measures are considered as priority, measures that directly contribute to the improvement of habitats with unfavourable conservation status or measures that have a positive influence on endangered species have a greater importance and will be considered first.

List of prioritized measures to be carried out, and estimated costs for these measures

- within Natura 2000 sites designated for the targeted habitats and species

Name and short description of the measures	Type of measure*	Target (Unit & quantity)	Estimated cost in Euros (annualised)	Possible EU co-funding source
Priority measures coming out of the Natura 2000 Management programme 2021-2027, that can't yet be defined	Recurring		50 000 –100 000	

Expected results for targeted species and habitat types:

- Optimal state for heathlands and shrubs.
- Better nature protection execution in forest and spatial planning and overall better execution and supervision of legislation regarding nature protection.

- Agricultural practices in line with cross compliance and nature protection.
- Developed detailed maps of habitat types, Improvement on awareness of fragility and preservation of habitats in question.

Expected results (other benefits):

- Listed measures will contribute to the overall protection of biodiversity, enhance ecosystem services and mitigate climate changes.
- Raised awareness of tourists, farmers, general public and other legislation participants in nature preservation.
- Also improvement of long-term tourism is expected.

E.2.3. Bogs, mires, fens and other wetlands

Current status of habitats and species, conservation measures taken until now and their impact so far, remaining pressures and threats

Among habitats of bogs, mires, fens and other wetlands listed in Annex 1 of the Habitats Directive six (6) are occurring in Slovenia and are depending on an active management through agricultural or other practises (e. g. grazing or mowing). These HT are:

7110	Active raised bogs
7140	Transition mires and quaking bogs
7150	Depressions on peat substrates of the <i>Rhynchosporion</i>
7210	Calcareous fens with <i>Cladium mariscus</i> and species of the <i>Caricion davallianae</i>
7220	Petrifying springs with tufa formation (<i>Cratoneurion</i>)
7230	Alkaline fens

The bogs, mires, fens and other wetlands range and its trend could be considered as favourable and stable, except for habitat type 7210 whose range status is unfavourable-inadequate. Areas of HT 7110, HT 7150 and HT 7140 for alpine region are in a favourable status, while areas of HT 7220 and HT 7140 in continental region are in an unfavourable-inadequate status. But the most critical are HT 7210 and HT 7230 whose area status is unfavourable – bad.

The overall status for habitats differs, only HT 7140 and HT 7150 both in alpine region have a favourable status. HT 7110, 7220, 7140 (continental region), HT 7150 (continental region) statuses are unfavourable-inadequate, furthermore status of HT 7210 and HT 7230 are unfavourable – bad, especially HT 7230 who's trend is in decline. Assessment of habitat states are summarize from the most recent available report on the conservation of habitats and species under Habitats Directive for ("Article 17 report" period 2013-2018), provided by IRSNC.

Although habitats statuses differ overall pressures and threats are similar. Agricultural pressures that threaten these habitats are: conversion into agricultural land, conversion from one type of agricultural land use to another, abandonment of management/use of other agricultural and agro-forestry systems, inappropriate techniques or timing of mowing grasslands, inappropriate application of natural or synthetic (mineral) fertilisers and drainage for use as agricultural land. Urban use also highly influences these habitats, as: (i) conversion from other land uses to housing, settlement, commercial/industrial or recreational areas, sports, tourism and leisure activities, (ii) pollution to surface or ground water due to urban run-offs, (iii) other residential and recreational activities and structures generating point pollution to surface or ground waters and (iv) modification of flooding regimes, flood protection for residential or recreational development, and (v) other human intrusions and disturbance not mentioned above. Habitats are also threatened from biological components, like: invasive alien species as well as problematic native species, or natural succession resulting in species composition change.

Bogs, mires, fens and other wetlands are important habitats for several species listed on the annexes of the Habitats Directive and birds listed in Bird directive. Since most of these habitats do not occur in in large areas and are intertwined with forest, grassland, shrubs and freshwater habitats several common species occur in these habitats.

Active raised bogs (7110) are oligotrophic (with little or no minerals and nutrients), acidic peat moss associations that form peat and receive nutrients only through precipitation water. They are formed in cold climates with high rainfall.

The most significant species communities of transition mires (7140) are those of low and medium-high sedges, together with peat (*Sphagnum* sp.) and some other mosses. Overall conservation status of *Sphagnum* sp. (1409) was in 2019 "Article 17 report" assessed as unfavourable-inadequate. Associations in Depressions on peat substrates of the *Rhynchosporion* (7150) are similar and closely related to transition mires, and are often found together in the same area

Alkaline fens (7230) are richer in nutrients than raised bogs but still poor in nutrients. The ground water can be just below the surface or on the surface and is rich in carbonates. Lowland species often thrive together with wetland grassland

species (Molinietalia). The most characteristic of the alkaline fens among others is the Loesel orchid (*Liparis loeselii*) with overall unfavourable-inadequate conservation status.

Where bogs and marshes pass into wet meadows *Eleocharis carniolica* (1898, unfavourable-inadequate conservation status) and butterflies like *Coenonympha oedippus* (1071, unfavourable-bad), *Hypodryas maturna* (6196, unfavourable-inadequate), *Maculinea teleius* (1059, unfavourable-bad), and *Euphydryas aurinia* (1065, unfavourable-inadequate) *Lycaena dispar* (1060, favourable) can be found.

On petrifying springs with tufa formation (Cratoneurion) (7220) other species of mosses like *Hamatocaulis vernicosus* (6216, unfavourable-inadequate) can be found. On base-rich flushes and springs dragonflies typical of smaller springs like Annex 2 species ornate bluet (*Coenagrion ornatum*, 4045 unfavourable-inadequate conservation status) and the endangered species sombre goldenring (*Cordulegaster bidentata*) can be found.

Measures needed to maintain or restore favourable conservation status

Active management measures are required to avoid further deterioration and improve structures and functions of the following areas covered by Annex I bogs, mires, fens and other wetland habitats. Therefore, direct nature protection should be carried out through spatial planning, forest planning and also water management planning, including the determination of quiet areas, areas with limited access or areas without grazing in the field (costs integrated in chapter E.1.2).

Field surveys and digital mapping for determination of precise area of different habitats (e.g. HT 7230, HT 7220, HT 7140, HT 7110, and HT 7150) and also data on species suitable habitat is badly needed (costs integrated in chapter E.1.3). Some of the habitats need to be restored through different measures or projects; especially invasive alien species should be eradicated or managed. To preserve the wetland habitats the most problematic areas should be purchased or contracts for long term conservation should be signed with landowners so the appropriate use of these areas will be provided. Additionally, very important is also management of the discharge and treatment of municipal wastewater.

Farming should be stipulated in accordance with nature, so agri-environment schemes and other investments under the CAP strategic plan should be more intensively promoted. Farmers should enter these schemes with higher percentages of their land, so educational measures will have to be implemented for informing and educating them (included also in chapter E.1.2). Moreover, more effective control of agri-environmental schemes and cross compliance of different standards is needed in the frame of EU prescribed system of control. Furthermore, the overall nature protection inspection should be also present in these areas.

Because recreation is becoming a big issue also near these wetland habitats, managing of these areas involves communication efforts to educate recreational users, so they will either recreate appropriately or they will recreate them self in the areas suitable for their recreation (costs integrated in chapter E.1.5).

Prioritization of measures to be implemented during the next MFF period

All the below listed measures are considered as priority.

List of prioritized measures to be carried out, and estimated costs for these measures

- within Natura 2000 sites designated for the targeted habitats and species

Name and short description of the measures	Type of measure*	Target (Unit & quantity)	Estimated cost in Euros (annualised)	Possible EU co-funding source
Define quiet areas, areas with limited access, areas without grazing etc. (e.g. HT 7230, HT 7140, HT 7110)	One-off	15 000 – 25000 € altogether	2 000 – 3 000	ERDF, EARDF
Restoration of habitat by eradication or management of invasive species, removing biomass, reducing water flow etc. (e.g. HT 7230, HT 7210, HT 7140, HT 7110, HT 7150)	One-off		450 000 – 750 000	ERDF, EARDF
Implementation of agricultural measures, stipulated in the CAP strategic plan (e.g. HT 7230, HT 7220 and HT 7140)	Recurring	100 ha	32 000 – 52 000	EARDF
Land acquisition and/or compensation to landowners for the binding limitations; no grazing, no fertilization, areas without wood plants, invasive plants eradicated or managed etc. (e.g. HT 7230, HT 7210)	One-off	100 ha	120 000 – 250 000	EARDF, ERDF, LIFE
Manage the discharge and treatment of municipal wastewater (e.g. HT 7230, HT 7140, HT 7110)	One-off	One project	250 000 – 400 000	ERDF
Inspection of relevant Natura sites incorporated into the work programme of the inspectorate (e.g. HT 7230, HT 7140)	Recurring	1 FTE	30 000 – 40 000	LIFE
Priority measures coming out of the Natura 2000 Management programme 2021-2027, that can't yet be defined	Recurring		100 000 – 200 000	

* indicate whether the measure is recurring or one-off

Expected results for targeted species and habitat types:

- The bogs, mires, fens and other wetlands in an optimal state.

- Better nature protection regulated through detailed plans for water regulations, execution and control of nature protection measures in forest and spatial planning and overall better execution and supervision of legislation regarding nature protection.
- Higher awareness of all public about fragility and importance of preservation of habitat in question.

Expected results (other benefits):

- Raised awareness of tourists, farmers, general public and other legislation participants in nature preservation.
- Improvement of long-term tourism is expected.
- Measures taken for protection of bogs, mires, fens and other wetlands will also contribute to the overall protection of biodiversity, enhance ecosystem services and mitigate climate changes.

E.2.4. Grasslands

Current status of habitats and species, conservation measures taken until now and their impact so far, remaining pressures and threats

Among the grasslands habitat types listed in Annex 1 of the Habitats Directive eleven (11) are occurring in Slovenia and all of them are depending on an active management through agricultural or other practises (e.g. grazing or mowing). They are:

6110	Rupicolous calcareous or basophilic grasslands of the <i>Alyso-Sedion albi</i>
6130	Calaminarian grasslands of the <i>Violetalia calaminariae</i>
6150	Siliceous alpine and boreal grasslands
6170	Alpine and subalpine calcareous grasslands
6210	Semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuco-Brometalia</i>) (*important orchid sites)
6230	Species-rich <i>Nardus</i> grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe)
62A0	Eastern sub-mediterranean dry grasslands (<i>Scorzoneratalia villosae</i>)
6410	Molinia meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinion caeruleae</i>)
6430	Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels
6510	Lowland hay meadows (<i>Alopecurus pratensis</i> , <i>Sanguisorba officinalis</i>)
6520	Mountain hay meadows

Range of all grassland habitats are considered as favourable with a stable trend. Only three out of eleven habitats have an overall favourable conservation status with a stable trend; these are: HT 6130, HT 6150 and HT 6170. Furthermore habitats 6110 and 6430 are both in a favourable conservation status with a stable trend in alpine region, while on the other hand in continental region HT 6110 has an unfavourable-inadequate conservation status and HT 6430 has an unfavourable - bad conservation status, both are in a declining trend. In habitats where unfavourable conservation status is defined, it is shown through all the categories; area, structure and functions, future prospects and in overall assessment, except as mentioned in range. Therefore habitats 6520 and 6230 in alpine region have unfavourable-inadequate conservation status through all areas. Habitats 6210, 6410, 6510, and 62A0 all have overall unfavourable – bad conservation status with a declining trend. Assessment of habitat states are summarize from the most recent available report on the conservation of habitats and species under Habitats Directive for ("Article 17 report" period 2013-2018), provided by IRSNC.

Several species listed on the annexes of the Habitats Directive and birds listed in Bird directive are living and breeding in grassland habitats. Many of them are present in a wide range of habitats, but several are tied to grasslands only.

Most typical species one usually connects with different types of grasslands are butterflies. Two butterflies of Annex 2 Habitats Directive that are strictly living on extensive *Sanguisorba*-rich grasslands with special management regime and no fertilization are *Phengaris teleius* (1059) and *Phengaris nausithous* (1061). There are two eco-types of *Coenonympha oedippus* (1071) present in Slovenia – one is inhabiting wet meadows of Ljubljansko barje in central Slovenia and other a dry overgrowing grasslands of western Slovenia. All listed butterflies are in unfavourable - bad conservation status due to loss and degradation of their habitat. *Euphydryas aurinia* (1065) conservation status is unfavourable – insufficient. In Slovenia, it lives in three types of habitat: extensive dry grasslands, wet and nutrient poor habitats and alpine. All habitats need to be managed extensively and its conservation status in Slovenia is unfavourable-bad on wet meadows. *Lycaena dispar* (1060) inhabits wet meadows and marshes, banks of rivers and lakes water ditches with high and dense vegetation and its conservation status is estimated as favourable.

Vascular plants like *Euphrasia marchesettii* (1714), *Pulsatilla grandis* (2093) *Himantoglossum adriaticum* (4104), *Scilla litardierei* (4101), *Serratula lycopifolia* (4087) and *Gladiolus palustris* (4096) thrive on extensive grasslands with very little or no fertilization. European pond turtle *Emys orbicularis* (1220) chose grasslands around freshwater habitats as nesting grounds. It has been assessed to be in unfavourable – insufficient conservation status in both biogeographic regions also due to loss of suitable nesting ground and low survival of young due to unsuitable agricultural use on nesting grounds. Grasslands (together with shrubs and hedges) within migration distances from their water habitats are important for

several amphibian species like *Triturus carnifex*, *Lissotriton vulgaris*, *Hyla arborea*, *Bufo viridis*, *Pelobates fuscus* etc. Even forest species or species of forest edges like brown frogs (*Rana arvalis* & *Rana dalmatina*) spend their summers on grasslands. Conservation status for most above listed amphibians was in report 2019 assessed as unfavourable – insufficient, for *Rana arvalis* as unfavourable – bad. Only invertebrate rich extensive grasslands can provide a long-term survival of their populations.

State of both micro-molluscs *Vertigo geyeri* (1013) and *V. angustior* (1014) in Slovenia is unknown; they were found on wet meadows and marshes around smaller springs.

Since 2008, the farmland birds' index has declined and the index of meadow bird species in the agricultural landscape has dropped. The eleven-year trend is a moderate decline, despite the index's rise for the third consecutive year since 2015. For several bird species grasslands- agricultural landscape are important feeding habitats, for some very important (or even only) breeding habitats. Grassland specialists are those species that are strictly tied to grasslands all their lives. Among these we can include the corncrake (*Crex crex*), the Rock partridge (*Alectoris graeca*), Eurasian curlew (*Numenius arquata*), and Common snipe (*Gallinago gallinago*). Less specialized are the Western yellow wagtail (*Motacilla flava*), Common quail (*Coturnix coturnix*), Eurasian skylark (*Alauda arvensis*) and woodlark (*Lullula arborea*) since they breed also in the fields. Northern Lapwing (*Vanellus vanellus*) once a typical species of moist meadows, today breeds almost exclusively on arable land and other similar low vegetation habitats. Several species like Whinchat (*Saxicola rubetra*), Red-backed shrike (*Lanius collurio*), lesser grey shrike (*Lanius minor*), common grasshopper warbler (*Locustella naevia*), Corn bunting (*Miliaria calandra*), Barred warbler (*Sylvia nisoria*) can be considered wider grassland species (species of cultural landscape) since they need open structured mosaic landscape with present scrubs and trees for nesting and feeding. The Little Owl (*Athene noctua*), the Eurasian scops owl (*Otus scops*) the Hoopoe (*Upupa epops*), the Eurasian Green Woodpecker (*Picus viridis*), Eurasian wryneck (*Jynx torquilla*), the European roller (*Coracias garrulus*), the Eurasian Jackdaw (*Corvus monedula*), the White stork (*Ciconia ciconia*) and Eurasian eagle-owl (*Bubo bubo*) and several birds of prey can also be considered grassland species since grasslands are their most important food habitat while nesting habitats are elsewhere.

List of species dependent on grassland habitats for which Agri-environmental measures Sub-measure 10.1 - Payment of agri-environment-climate commitments in the period 2014-2020 were identified is in Appendix 1 to this document.

Although habitats and species conservation statuses differ overall, pressures and threats are similar. In grassland habitats agricultural threats are: intensification of agricultural use (fertilization, intensification of mowing regime), conversion into agricultural land, conversion from one type of agricultural land use to another, changes in terrain and surface of agricultural areas, abandonment of grassland management, abandonment of traditional management systems or use of other agricultural systems such as the abandonment of traditional farming. Furthermore, inappropriate techniques or timing and higher frequencies of mowing, intensive grazing or overgrazing by livestock on one hand and on other hand extensive grazing or under grazing, reseeding of grasslands, application of natural or synthetic (mineral) fertilisers on agricultural land and drainage for use as agricultural land. Grassland habitats are also damaged from extraction of rocks, conversion to forest, or afforestation and problems related to invasive alien species. Threats also come from modification of hydrological flow, abiotic natural processes (e.g. natural erosion in areas with naturally low vegetation cover) and changes in species composition due to natural succession. Besides agricultural threats there are also big threats from urban usage, like conversion from grasslands to housing, settlement or recreational areas, threats from sport, tourism and leisure activities. Along with all mentioned threats in grasslands fires are also a big hazard and an additional threat.

Measures needed to maintain or restore favourable conservation status

Majority of grassland habitat types and grassland species have an overall unfavourable conservation status and therefore need active management to avoid further deterioration and improve structures and functions of the following areas covered by Annex I Grasslands.

Land acquisitions and/or compensations to landowners/farmers are the most important measures for conservation of grassland habitats. Gained land parcels will be used for restoration or preservation of persistent grassland habitats where classical intensive farming is not possible. Costs below thus integrates not only restoration work but also compensation/acquisition costs of the grasslands to be restored.

Agricultural threats should be additionally addressed with measures integrating agri-environmental schemes for recurring management of adapted agricultural practices with positive effects on grasslands. Furthermore, additional introduction and testing of different approaches for sustainable grassland management on the field will be implemented to prevent natural succession as a result of inappropriate agricultural management.

In small Natura 2000 sites and/or habitat types/species with specific requirements additional specific measures for maintenance and/or restoration will be carried out. Additionally, educational measures will have to be implemented for informing and educating visitors, farmers, recreational enthusiasts and other public for appropriate usage of these habitats to minimize the pressure to these habitats or individual species that are important in these areas (included in chapter E.1.5).

With the goal of minimizing negative effect of farming to grasslands and changing into farming practices that benefit nature, nature conservation advisory service and agricultural advisory service will be significantly strengthened by employing a bigger number of additional experts (costs integrated in chapter E.1.2). They will stipulate the adapted agricultural practices that have positive effects on species/habitat types and biodiversity. It is planned to develop and

implement agri-environmental measures for preservation of grassland habitats outside Natura 2000 sites, based on analysis of situation, SWOT and analysis and needs estimate, as well as relevant EU legislation.

Invasive alien species are dominating indigenous species and therefore endangering grassland habitats, thus research of the most efficient methods for eradication or management of invasive alien species on grassland habitats are necessary. Again improvement and tighter control from inspectorate for environment and spatial planning is essential for preservation of grassland habitats (costs integrated in chapter E.1.2).

Prioritization of measures to be implemented during the next MFF period

All the below listed measures are considered as top priority and should be implemented in the next financial period.

Preliminary total allocation from the EARDF to the Member State is indicative. The final total amount and its allocation by activities and possible partial replacement by EAGF funds via the so-called eco-scheme are subject to the MFF agreement.

List of prioritized measures to be carried out, and estimated costs for these measures

- within Natura 2000 sites designated for the targeted habitats and species

Name and short description of the measures	Type of measure*	Target (Unit & quantity)	Estimated cost in Euros (annualised)	Possible EU co-funding source
Land acquisition - purchase of land (e.g. HT 6210, HT 6410, HT 6510 and species related with those habitats)	One-off	Acquisition: 14 600 €/ha; 500 ha = 7.3 MIO €	0,8 M – 1.4 M	ERDF, LIFE
Compensation to landowners/farmers - lease of land (e.g. HT 6210, HT 6410, HT 6510 and species related with those habitats)	Recurring	Compensation: 700 €/ha; 500 ha = 350 000 € per year	280 000 – 450 000	ERDF, LIFE
Restoration and recurrent management of semi-natural and extensive grasslands that are not included in the agri-environmental schemes (e.g. HT 6110, HT 6170, HT 6210, HT 6230, HT 62A0, HT 6410, HT 6510, HT 6520)	Recurring	1 350 ha	830 000 – 1.9M	ERDF, LIFE
Agri-environmental schemes for recurring management of adapted agricultural practices with positive effects on habitat types (e.g. HT 6110, HT 6170, HT 6210, HT 6230, HT 62A0, HT 6410, HT 6510, HT 6520) and species related with those habitats (list in appendix 1)	Recurring	24 495 ha	8 M – 12 M	EARDF
Introduction and testing of different approaches for sustainable grassland management on the field	One-off	100 farms /300 ha (project)	350 000 – 600 000	EARDF, LIFE
Management of small Natura 2000 sites and/or habitat types/species with specific requirements	One-off	2 EIP projects 2 pilot project	450 000 – 750 000	EARDF
Investments for extensive farming in grassland habitats	One-off	30 lawn mowers for steep slopes	50 000 – 85 000	EARDF
Strengthening of environmental inspection	Recurring	1 FTE	30 000 – 45 000	
Evaluation of the conservation value of grasslands in Kras Plateau with special regard to mesic grasslands in enclosed karst depressions (dolines, also known as sinkholes) and their value as climate-change refugia for cool-adapted species that are endangered by anthropogenic degradation and mostly with afforestation	One-off		12 000 – 15 000	LIFE, ERDF
Planning of the optimal spatial and functional distribution of animal manure waste treatment to reduce the pressures of the use of animal manure on grasslands	One-off	National Plan for the building of animal manure waste treatment	15 000 – 20 000	LIFE, EARDF, ERDF
Priority measures coming out of the Natura 2000 Management programme 2021-2027, that can't yet be defined	Recurring		100 000 – 200 000	

- additional measures beyond Natura 2000 (wider green infrastructure measures)

Name and short description of the measures	Type of measure*	Target (Unit & quantity)	Estimated cost in Euros (annualised)	Possible EU co-funding source
Agri-environmental measures for preservation of grassland habitats outside Natura 2000 sites	Recurring		2,5 M – 4,3 M**	EARDF

* indicate whether the measure is recurring or one-off

** current estimate is indicative, final estimate is subject to several conditions which are yet unknown

Expected results for targeted species and habitat types:

- Grasslands habitats in an optimal state.
- Agricultural practices on a higher level and respecting cross compliance and nature protection requirements.
- Stronger environmental inspection, water management and spatial planning by including nature conservation management measures into annual work programmes.
- Higher awareness of public about the importance and fragility of grasslands.

Expected results (other benefits)

- Raised awareness of farmers, tourists and other general public in nature management and preservation of grasslands. Improvement of benefiting agricultural practices is expected also outside Natura 2000 sites.
- Measures will contribute to the overall protection of biodiversity, enhance ecosystem services and mitigate climate changes.

E.2.5. Other agroecosystems (incl. croplands)

n.a.

E.2.6. Woodlands and forests**Current status of habitats and species, conservation measures taken until now and their impact so far, remaining pressures and threats**

The status of forest habitat types listed in Annex 1 in Slovenia depends on the sustainable and multi-purpose forest management and nature conservation guidelines. Annex I habitat types (forest habitats) are:

91E0	Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i>)
9110	<i>Luzulo-Fagetum</i> beech forests
9180	<i>Tilio-Acerion</i> forests of slopes, scree and ravines
9340	<i>Quercus ilex</i> and <i>Quercus rotundifolia</i> forests
9410	Acidophilous <i>Picea</i> forests of the montane to alpine levels (<i>Vaccinio-Piceetea</i>)
9530	(Sub-) Mediterranean pine forests with endemic black pines
91D0	Bog woodland
91F0	Riparian mixed forests of <i>Quercus robur</i> , <i>Ulmus laevis</i> and <i>Ulmus minor</i> , <i>Fraxinus excelsior</i> or <i>Fraxinus angustifolia</i> , along the great rivers (<i>Ulmion minoris</i>)
91K0	Illyrian <i>Fagus sylvatica</i> forests (<i>Aremonio-Fagion</i>)
91L0	Illyrian oak-hornbeam forests (<i>Erythronio-Carpinion</i>)
91R0	Dinaric dolomite Scots pine forests (<i>Genisto januensis-Pinetum</i>)

According to the recent report on the conservation status of habitats and species under Habitats Directive ("Article 17 report" of 2019), habitat types 91R0 in both regions, 9530 in Alpine region and 91K0 in continental region are in a favourable conservation status. Habitat types 91F0 and 91E0 in continental region are in an overall conservation status unfavourable bad. All the other forest habitat types have an overall conservation status as unfavourable-inadequate.

Habitat type 9110 *Luzulo-Fagetum* beech forests is one of the three most common forest habitat types in Slovenia and is therefore represented in both alpine and continental region. Due to the presence of habitat type on larger areas and distribution in different parts of Slovenia, the overall assessment of habitats conservation status is unfavourable-inadequate with a stable trend. This is mostly because of inadequate forest management in the past, where spruce was planted or promoted in these areas; consequently spruce has become the dominant species in some parts of this habitat.

Woodlands and forest also consist of habitat type HT 9180 *Tilio-Acerion* forests of slopes, scree and ravines, whose overall conservation status is also unfavourable-inadequate but with a declining trend. One of the major factors and indicators that indicate the unfavourable-inadequate conservation status of the HT 9180 is a relatively large proportion of spruce in wood stock, which is also consequence of the past management. Thus additional threat to the habitat according to several forest management plans is due to the inadequate forest management in the past and the influence of herbivores on the natural regeneration of forest. Therefore rejuvenation of this HT is difficult.

The main species in habitat type 91D0 bog woodlands are bog spruce and pine, where pine (*Pinus mugo*) reaches greater heights (in some places) more than 5 meters. This habitat occur only in alpine region and even here in small areas. Consequently overall assessment of conservation status for habitat type 91D0 bog forests is unfavourable-inadequate with a declining trend. One of main characteristic for this habitat is its delicate bog ground. Therefore biggest immediate threats to this habitat are all related to damaging or changing of chemical properties of soil and soil water. Consequently conflicts arise from inadequate foresting, infrastructural measures, recreational use, and even from agricultural use for grazing of

cattle. All of these impacts the ground and can therefore damage the delicate natural processes in this habitat. Additional threat to habitat 91D0 presents its fragmentation, pollution and climate change.

Habitat type 91E0 alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*) is mainly recognized by its typical species like grey and black alder, European or so called common ash, poplar trees, grey willow and other orogenic willows with their associated communities. This habitat appears in both alpine and continental region, in alpine region its overall assessment of conservation status is unfavourable-inadequate, in continental region its overall assessment is unfavourable-bad. In both cases the trend is declining. This is mostly due to bad state of habitat in area, structure and functions, and in future prospects, which is partly due to its appearance on relatively small areas on banks of watercourses mostly in lowlands. Therefore quite a huge pressure on habitat 91E0 comes from agriculture, urbanization, infrastructure and industry. Furthermore additional threat comes from river regulation. Moreover Kutnar L. and Daskobler I. in their review also estimate that biggest threat to habitat type 91E0 come from fragmentation, pollution, invasive plants species and climate change.

Habitat type 91F0 Riparian mixed forests of *Quercus robur*, *Ulmus laevis* and *Ulmus minor*, *Fraxinus excelsior* or *Fraxinus angustifolia*, along the great rivers (*Ulmion minoris*) is represented only in continental region. The overall assessment of conservation status of habitat type 91F0 is unfavourable-bad with a declining trend. This is mostly due to unclear spatial separations on one side and habitat being on relatively small areas that are subject to constant pressures from fragmentation processes on the other. Additional threats that further endanger habitat type 91F0 come from all changes that change the flood regime which are direct as well as potential like constructions of hydropower plants in this habitat. On the other hand this habitat is also endangered by the spread of invasive plant species.

Habitat type 91K0 Illyrian *Fagus sylvatica* forests (*Aremonio-Fagion*) is the most widespread of all forest habitat types in Natura 2000 in Slovenia and is very broad in terms of space, content and function. Therefore habitat type 91K0 occurs in both continental and alpine region, where overall conservation status for continental region is set as favourable with a stable trend and overall conservation status for alpine region is set as unfavourable – inadequate, also with a stable trend. In previous reporting period both regions had favourable overall conservational status. The main threat to habitat type 91K0 presents conversion of forest habitats into another type of forest habitat, often conversion from extensive forests into production forests (e.g. conversion to monocultures) but also other types of conversion (e.g. conversion from coppice to high forest or changes of tree species composition). Habitat is also in danger due to climate change, (e.g. rise of temperature and extremes).

Habitat type 91L0 Illyrian oak-hornbeam forests (*Erythronio-Carpinion*) is the third most represented habitat type in terms of surface area, which is widespread in the flat and hilly part of various phytogeographic areas of Slovenia. Therefore it is obvious that the habitat occurs in both continental and alpine region. The overall assessment of habitat 91L0 conservation status is unfavourable-inadequate with a stable trend. This is mainly due to its presence near the urban areas, where constant pressures from fragmentation processes is an ongoing effect. Therefore it is evident that one of biggest threats is also conversion of this habitat into agricultural land, decline in forest area due to non-replanting or absence of natural regrowth after forest exploitation and also endangerment by the spread of invasive plant species from urban areas.

Habitat type 91R0 dinaric dolomite Scots pine forests (*Genisto januensis-Pinetum*) occur on steep dolomite slopes, predominantly on shallow and skeletal soils subject to erosion processes. This habitat type is characterized by the predominance of red pine and in some cases black pine (*Pinus nigra*; *Genisto januensis-Pinetum sylvestris pinetosum nigrae*). These are mostly set as protective forests, as they protect the steep vegetation before intense erosion. The overall assessment of conservation status for habitat 91R0 is favourable with a stable trend in both regions. Main threats for this habitat are changes in a species composition due to natural succession (e.g. primary succession after natural disturbances) and extraction of rocks, gravel and sand from quarries.

The combination of *evergreen* or so called holly oak with *European hop-hornbeam* define habitat type 9340 *Quercus ilex* and *Quercus rotundifolia* forests which is a rare fragment of the Mediterranean association of forest vegetation in Slovenia. This habitat is a typical Mediterranean forest community, which in Slovenia is rarely preserved in its original form. Mostly they destroyed it long ago and turned it into shrub habitats. Habitat type 9340 occurs only in continental region and even here it appears in relatively small preserved patches, consequently the overall conservation status of this habitat is unfavourable – inadequate with a stable trend.

Spruce is the dominant species in habitat type 9410 Acidophilous *Picea* forests of the montane to alpine levels (*Vaccinio-Piceetea*) with beech and fir also playing a significant role in this habitat, sometimes also larch in the background.. This habitat occurs only in alpine region and has the overall conservation status set as unfavourable – inadequate, with a stable trend. Therefore the main pressures to this habitat are the temperature changes and extremes in correlation to climate change, which affect the gradation of the bark beetles; this is despite spruce being in its natural habitat.

Of course the main species of habitat type 9530 (Sub-) Mediterranean pine forests with endemic black pines is black pine, occurring, mainly on steep slopes in small areas mostly in north-western and northern part of Slovenia with individual patches also located in central and southern Slovenia. These forests are considered one of the best preserved in Slovenia in the Natura 2000 area, in correlation to the percentage of having representative species related to the habitat. Otherwise habitat type 9530 is mainly threatened by changes in a species composition due to natural succession, natural forest fires and climate change, where temperature changes and extremes can cause drastic decline in trees vital functions. Consequently habitat type 9530 in Natura 2000 area in Slovenian alpine region is represented with its overall assessment of conservation status as favourable with a stable trend.

The assessment of above Natura 2000 woodlands and forest habitat types is a result of the most recent report on the conservation status of habitats and species under Habitats Directive ("Article 17 report" of 2019), provided by IRSNC and the article Evaluation of the Conservation Status of Forest Habitat Types (Natura 2000) and Their Forest Management (L. KUTNAR, I. DASKOBLER, 2014)

High diversity of forest habitat types brings also high diversity of forest species. Some of them are strictly dependant on the forest environment; others choose the forest only at a certain part / stage of their life. There are measures that are already being implemented for achieving their favourable conservation status. List of species dependent on woodlands and forest habitats for which forestry measures were identified is in Appendix 1 to this document.

Saproxylic beetles are insects that depend on dead and decaying wood for at least part of their lifecycle, and play important ecological roles in forest habitats. Together with fungi, they contribute to the break-down of deadwood and are involved in decomposition processes and the recycling of nutrients in natural ecosystems. Species like *Lucanus cervus*, *Rosalia alpina*, *Cucujus cinnaberinus*, *Cerambyx cerdo*, *Morimus funereus*, *Stephanopachys substriatus*, *Carabus variolosus*, *Rhysodes sulcatus* *Osmoderma eremita* are dependent upon veteran trees with decaying heartwood and can be found in different forest habitat types where trees have been retained into maturity and old age, for a variety of reasons. Suitable trees occur in a wide variety of situations – primary forests, old wood pastures, historic parklands, hedgerow trees, old avenues, orchards, etc.

Little is known about distribution, conservation and trend for mosses *Dicranum viride*, *Buxbaumia viridis*, *Mannia triandra* and *Leucobryum glaucum*. Conservation status for all above listed mosses is assessed as unknown.

Rare forest vascular plants listed in Annex II of the Habitats directive include the largest orchid species in Europe *Cypripedium calceolus* (1902) that is found in shady beech forests on limestone to the subalpine border, *Adenophora liliifolia* (4068) - species of meso-thermophilous herbaceous woods margins, shrubs and hedges and *Rhododendron luteum* (4093) - bushy deciduous shrub and a small fern species *Asplenium adulterinum* (4066) which can be found in light forests, forest clearings and forest edges. Conservation status of listed species was assessed as favourable with exception of *Adenophora liliifolia* in Continental biogeographical region where its state is assessed as unfavourable – inadequate.

Leptidea morsei occurs almost exclusively in oak forest and mixed deciduous woods – on grassy vegetation at the sunny edges of forest, forest clearings and regenerating forests. *Euphydryas maturna* is another butterfly species of forest clearings of mixed forest with young stands of common ash (*Fraxinus excelsior*) and Eurasian aspen (*Populus tremula*). Both are in unfavourable - inadequate conservation status in Slovenia. *Callimorpha quadripunctaria* is a butterfly of moist meadows, slopes of deciduous and mixed forests and areas with marginal herbaceous forest vegetation. It is in favourable conservation status in Slovenia.

For bat species of Annex 2 species of Habitat directive *Rhinolophus hipposideros* (1303), *R. ferrumequinum* (1304), *R. euryale* (1305), *Barbastella barbastellus* (1308), *Miniopterus schreibersi* (1310), *Myotis bechsteini* (1323), *M. blythii* (1307), *M. capaccinii* (1316), *M. emarginatus* (1321) and *M. myotis* (1324) woodlands and forest habitats are an important feeding grounds but for some species the bark of trees and tree cavities are also important as roosting sites. There are at least four species in Slovenia tied to the forest for most of their lives - these are *Barbastella barbastellus*, *Myotis bechsteini*, *Nyctalus noctula* and *Nyctalus leisleri*. Research results also show that not all forests are the same; a well-structured deciduous or mixed deciduous forest seems to meet the demands of these species best.

More than 20 bird species from Annex I of the Birds Directive can be directly associated with forests in Slovenia according to publication of European Commission Natura 2000 and forests (Part I-II)¹⁶.

16

<https://ec.europa.eu/environment/nature/natura2000/management/docs/Final%20Guide%20Natura2000%20Forests%20Part%20I-II-Annexes.pdf>.

Because forests cover more than 70 per cent of the Natura 2000 network in Slovenia, they are extremely important for avian biodiversity and vital populations of forest bird communities, such as owls (*Strix uralensis*, *Aegolius funereus*, *Glauclidium passerinum*, *Bubo bubo*), woodpeckers (*Dendrocopos leucotos*, *Dendrocopos medius*, *Picoides tridactylus*, *Dryocopus martius*, *Picus canus*), forest grouse (*Tetrao urogallus*, *Bonasa bonasia*, *Tetrao tetrix*) and eagles (*Haliaeetus albicilla*, *Aquila chrysaetos*). Only two forest species have positive short-term population trend during last 12 years - *Haliaeetus albicilla* and *Strix uralensis*. Three woodpecker species (*Dendrocopos leucotos*, *Dendrocopos medius*, *Picoides tridactylus*) and two grouse species (*Tetrao urogallus*, *Bonasa bonasia*) have short and long-term decreasing trend.

Low amounts of deadwood and lack of unmanaged forests possess main threat for woodpecker species, as these elements are essential structures in their foraging and nesting habitats. Several conservation measures were implemented in recent years to improve habitat conditions and consequently achieve a favorable conservation status of woodpeckers (national Forest fund, LIFE Kočevsko project, EGP SUPPORT project):

- increase of old growth (forests reserves) and unmanaged forests area,
- preservation of mature tree stands (ecocells, biodiversity islands, set-asides),
- preservation of habitat trees (biotope trees),
- tree girdling (ring barking) in pole and regeneration stand stages,
- leasing contracts with private forest owners for leaving their forests parcels or single habitat trees unmanaged.

Training sessions and educational workshops about habitat requirements of woodpecker species and possible conservation measures were organized in order to help forest managers implement conservation measures in woodpecker habitats.

Several factors have contributed to the recent decline in populations of forest grouse species. Changes in forest stand structure and feeding habitat deterioration has probably played the main role, while increase in the population of ground nest predators and increased disturbance due to tourism and recreation playing a significant role also.

(1) Establishment of gaps, corridors and feeding fences, (2) planting of fruiting and pioneer trees (3) establishment of quiet areas (no forestry operation from March to July), installation of road gates and road signs, (4) removal of hunting objects, (4) mulching of forest road edges are just few conservation measures that were implemented in recent years for forest grouse species (LIFE Wetman project, LIFE Kočevsko project, EGP SUPPORT project).

In addition to implemented conservation measures, several training sessions and educational workshops about habitat requirements of forest grouse and possible conservation measures were organized for forest managers, hunters and nature conservation advisors.

Slovenia has eight species of carnivores protected with Habitat directive, from which four are listed in both Annex 2 and Annex 4, one is listed in Annex 4 and three are listed in Annex 5. Therefore Slovenian carnivores are; *Canis lupus*, *Ursus arctos*, *Lynx lynx*, *Canis aureus*, *Lutra lutra*, *Martes martes*, *Mustela putorius* and *Felis silvestris*. Slovenian woodland and forest present a living, breeding, feeding or at list roosting areas for all of the listed carnivores. Consequently all of them live in both alpine and continental area. Five of the carnivore species in Slovenia have an overall assessment of conservation status defined as favourable, most of them having an increasing trend, only wildcat having a stable trend. Differently European otter (*Lutra lutra*) has an overall assessment of conservation status defined as unfavourable – inadequate, with a stable trend in continental region and an unknown trend in alpine region. For European polecat (*Mustela putorius*) there is not enough data, especially regarding the size of population and the trend, therefore the overall conservation status and trend for it is set as undefined. Contrary from the other carnivores lynx (*Lynx lynx*), has an overall conservation status defined as unfavourable – bad, this is mainly due to its poor state of population with a declining trend, and also its evaluation in population area which is unfavourable – inadequate with a declining trend. First three of the listed carnivores wolf, bear and lynx are so-called large carnivores which are umbrella species of Slovenian forest. A lot of knowledge was gained over several LIFE and INTERREG projects, many of them were recognised as very successful by the EU. Costs for measures concerning large carnivores are integrated in chapter E.3.2. Prevention, mitigation or compensation of damage caused by protected species.

Measures needed to maintain or restore favourable conservation status

Despite the majority of woodland and forest habitats being in an overall stable conservation situation an additional management to avoid further deterioration and improve structures and functions of these habitats is needed. Even though forest management has a long term standing practice of systematic planning with forest management plans where conservational measures are determined, further improvements have to be done on implementing measures in the field. Therefore additional measures that need to be carried out in the field are listed in this section: conservation of forest biotopes, exclusions of forest Eco-cells, conservation of deadwood and habitat trees, all of them striving to protect the well preserved parts of healthy habitats.

On the other hand direct measures are also predicted, like planting of seedlings of fruit-bearing tree species to further improve the habitats. Reforestation measures are planned where natural processes of rejuvenations are not successful, also road barriers are planned to manage tourist, visitor, farmers, hunters and foresters access in the areas where habitats are threatened from human activities. In habitats where influence of herbivores is preventing natural regeneration of forest measures for protection of stand initiation with a fence are foreseen. Many habitats are also endangered from invasive plant species which interfere with their natural processes; therefore measures to remove invasive plant species are also predicted.

All the above listed measures are meant for both state and privately owned forest. In order to maintain a favourable conservation status and to improve the conservation status of the forest species and habitat types, it is necessary to implement all the above measures. Priority should be given to the implementation of measures where they are needed the most to adapt them according to nature conservation guidelines and climatic and socio-economic conditions in habitats. Additionally control over the implementation of these measures in the field and the use of funds must be enhanced. The active communication of all professional services in this field must strengthen, and aim at sensible interventions in natural environments within and outside Natura 2000 sites. Participatory capacity building between forest owners and managers, forestry and nature conservation experts, scientists and other stakeholders in Slovenian forestry are all on a high level but must still aim for further improvement.

Prioritization of measures to be implemented during the next MFF period

Although all measures are considered as priority, measures that directly contribute to the improvement of habitats with unfavourable conservation status or measures that have a positive influence on endangered species have a greater importance and will be considered first.

List of prioritized measures to be carried out, and estimated costs for these measures

- within Natura 2000 sites designated for the targeted habitats and species (listed in Appendix 1 to this document)

Name and short description of the measures	Type of measure*	Target (Unit & quantity)	Estimated cost in Euros (annualised)	Possible EU co-funding source
Conservation of biotopes - natural development, felling, tending (private forests)	Recurring	1 400 ha	600 000	ERDF, LIFE
Conservation of biotopes - natural development, felling, tending (state forests)	Recurring	700 ha	300 000	ERDF, LIFE
Planned released of biomass in the forest (private forests)	Recurring	2 100 pcs	30 000	ERDF, LIFE
Planned released of biomass in the forest (state forests)	Recurring	1 400 pcs	20 000	ERDF, LIFE
Planting of seedlings of fruit-bearing tree species (private forests)	Recurring	24.000 pcs	11000	ERDF, LIFE
Planting of seedlings of fruit-bearing tree species (state forests)	Recurring	14.000 pcs	6 000	ERDF, LIFE
Rejuvenation measures (private forests)	Recurring	350 ha	200 000	ERDF, LIFE
Rejuvenation measures (state forests)	Recurring	105 ha	60 000	ERDF, LIFE
Road barriers (private forests)	Recurring	140 pcs	30 000	ERDF, LIFE
Road barriers (state forests)	Recurring	70 pcs	15 000	ERDF, LIFE
Protection of stand initiation with a fence (private forests)	Recurring	175 ha	100 000	ERDF, LIFE
Protection of stand initiation with a fence (state forests)	Recurring	140 ha	80 000	ERDF, LIFE
Removal of invasive species (private forests)	Recurring	42 ha	273 000	ERDF, LIFE
Removal of invasive species (state forests)	Recurring	35 ha	228 000	ERDF, LIFE
Land purchase of forest land (private forests)	Recurring	600 ha	3 000 000	ERDF, LIFE
Mulching the slopes of forest roads (all forests)	Recurring	70 ha	13 000	ERDF, LIFE
Tree girdling (all forests)	Recurring	140 ha	35 000	ERDF, LIFE
Maintenance of shrubs (all forests)	Recurring	200	15 000	ERDF, LIFE
Maintenance of larger water bodies in the forest (all forests)	Recurring	140 sections	5 000	ERDF, LIFE
Construction of of water bodies in the forest (all forests)	Recurring	35 sections	15 000	ERDF, LIFE
Preparation of stand for natural restoration (all forests)	Recurring	350 ha	18 000	ERDF, LIFE
Determination of interconnection of doline microclimate with cave microclimate on forested karst areas that provide special karst depression refugium typical for higher altitudes adapted to common temperature inversion	Recurring	10 dolines within Natura 2000 sites	25 000	LIFE, HORIZON EUROPE, INTERREG

Expected results for targeted species and habitat types

All of the above measures will be implemented as a matter of priority on species and habitat types that are in poor condition or species and habitat types that are deteriorating. All measures are recurring and if they are implemented to the fullest extent, the situation of habitat types is expected to improve.

Expected results: other benefits

Forests and woodlands in Slovenia have an important role in protecting the environment at a local and even regional level. At a local level trees can also bring many environmental benefits like providing protection against wind erosion. Forest helps increase the rate at which rainwater infiltrates and recharges the groundwater. Furthermore forests provide a series of ecosystem services, e.g., climate regulation and carbon sequestration, nutrient cycling, berry and fungi production, game production, water regulation and supply, flood prevention, biodiversity protection and human recreation. Forest measures listed in this paragraph will further increase ecosystem services and improve structures and functions of the Natura 2000 habitats.

E. 2.7. Rocky habitats, caves & sparsely vegetated lands

Current status of habitats and species, conservation measures taken until now and their impact so far, remaining pressures and threats

Among the rocky habitats, dunes & sparsely vegetated lands habitat types listed in Annex 1 of the Habitats Directive six (6) are occurring in Slovenia:

8120	Calcareous and calcshist screes of the montane to alpine levels (<i>Thlaspietea rotundifolii</i>)
8160	Medio-European calcareous scree of hill and montane levels
8210	Calcareous rocky slopes with chasmophytic vegetation
8220	Siliceous rocky slopes with chasmophytic vegetation
8240	Limestone pavements
8310	Caves not open to the public
8340	Permanent glaciers

Ecosystems that make Slovenia outstanding are subterranean habitats and subterranean fauna. Slovenia is a global hotspot of subterranean biodiversity. The cave clam *Congeria jalzici* (6922) (*Congeria kusceri* 4065), the cave beetle *Leptodirus hochenwartii* (4019) and the olm, *Proteus anguinus* (1186)*, are species of Annex II of the Habitats Directive with evolutionary adaptations to cave life (troglobionts) and therefore exclusively inhabit caves. The overall conservation status according to the recent report on the conservation status of habitats and species under Habitats Directive ("Article 17 report" of 2019), is assessed as unknown for *Leptodirus hochenwartii* and "unfavourable – bad" for *Proteus anguinus* and *Congeria jalzici*. Some species of birds may inhabit the entrance parts of caves for nesting, several Annex II bat species like *Rhinolophus hipposideros* (1303), *R. ferrumequinum* (1304), *R. euryale* (1305), *Barbastella barbastellus* (1308), *Miniopterus schreibersi* (1310), *Myotis bechsteini* (1323), *M. blythii* (1307), *M. capaccinii* (1316), *M. emarginatus* (1321) and *M. myotis* (1324) use caves during winter for hibernation and during warmer months as important roosts. Overall conservation status of listed bat species is according to the 2019 Article 17 report of Habitats Directive predominantly assessed as unfavourable – inadequate and unfavourable – bad. There are more than 13.000 known natural caves and 64 Natura 2000 sites designated for conservation of the qualifying habitat type HT 8310 Caves not open to the public. Moreover, around 74 % of all karst caves in Slovenia are within Natura 2000 sites. The overall conservation status assessment of this habitat type is "unfavourable-inadequate" ("Article 17 report" of 2019).

In Slovenia, caves are protected within nature conservation legislation principally with Cave conservation act (The Cave conservation act governs the protection and use of underground caves protection arrangements, protective measures and other rules of conduction including the restoration of polluted or damaged caves). Therefore, all caves in Slovenia are natural features of national importance and public natural assets and are owned by the state. They are defined as ecologically important areas or special conservation areas pursuant to the regulations governing the field of nature conservation. Slovenia has approximately 13.150 caves, from which 2500 caves are endangered by pollution. The main threat to caves as a habitat is pollution introduced from the surface (among the biggest polluters are inappropriate measures in agriculture, release of industrial waste, household's sewage disposals and unrefined waters from wastewater treatment plants), which then leak through ground into underground waters and accumulates in caves.

Other habitats of this chapter, except HT 8210 Calcareous rocky slopes with chasmophytic vegetation and HT 8340 Permanent glaciers, are reported as being currently in a favourable conservation status. In the most recent available report on the conservation of habitats and species under Habitats Directive ("Article 17 report" of 2012), the structures and

functions" criterion for these habitat types except for the mentioned exceptions has been assessed as favourable. For most the status has not changed from the previous report.

The HT 8210 Calcareous rocky slopes with chasmophytic vegetation are assessed in the report under "structures and functions" and also under "current conservation status" as unfavourable – inadequate. For habitat type 8340 Permanent glaciers under "structures and functions, current conservation status and future prospects" is deemed as unfavourable – bad. Slovenia has only two remaining permanent glaciers and both are essentially gone, with there remains serving only as reminders of the pervasive effects of climate change. While one of them named Glacier under the Skuta is in better condition mostly to its natural shady location which prevented its total disappearance. Furthermore constant surveillance of both glaciers contributes to understanding of climate change impacts in Slovenia.

Rocky habitats are also damaged by unsuitable use, mountaineering or climbing and therefore species living in these habitats are under pressure also. Consequently in the region of Triglav national park twenty scree slopes were identified as being threatened from mountaineering or climbing. For these reasons six confrontations with participants, one meeting, two introductions, and additional information's about protecting species through correct use of mountain trails were passed through the local paper. Near the endangered areas sixteen informational boards were placed to inform people of the protected areas and the protected measures needed to be taken to ensure the survival of the species in the area. These measures were financed through LIFE Nature projects targeting the restoration of these habitats (LIKE and Za Kras). Also 0.59 ha of endangered habitat area, where restoration and correct use of the rocky habitat is needed was acquired.

These measures have raised the surface of the areas within the Natura 2000 network and some results are already being shown, but additional measures will have to be taken out for further management of considered habitats.

Measures needed to maintain or restore favourable conservation status

To identify and restore favourable conservation status of habitat type Caves not open to the public (HT 8310) more effort should be put on identification of current subterranean habitat and their biodiversity and its connectivity. Moreover, before detailed conservation measures can be implemented, linking of potential threats and their impact on subterranean fauna needs to be evaluated. Since karst covers 44% of the county general measures cannot be implemented on whole area. For most effective planning and pinpointing of measures different analysis should be performed (e.g. pollution sources mapping, evaluation of cave pollution). Species and habitat type monitoring is included in chapter E.1.3 and E 1.4, other connected directly to conservation measures are listed below.

Owing to the inaccessibility of the subterranean environment, there is a critical lack of basic knowledge required to monitor the conservation state and effectively plan nature conservation measures to ensure favorable conservation status for cave species, especially *P. anguinus* (a priority species of the Habitats Directive). Conservation of significantly better explored surface species / habitat types is based on knowledge of their distribution, species abundance, availability of suitable habitats and their use. For cave species, however, little is known about the basic biology of the species, as well as the actual distribution of underground habitat, the size of populations, the threats and pressures (especially from the surface) on their habitat and the resulting conservation status. Given the specifics of the subsurface habitat, adopting a methodology for monitoring and ensuring the favourable conservation status of these species from surface species / habitats is a challenging task. Therefore further research is needed to plan effective measures for conservation of these species. Costs of needed research are listed in chapter E.1.3 and chapter E.1.4.

Conservation measures with direct impact on water quality, such as improving and extending the public sewage infrastructure and usage of new technologies in development of more efficient household wastewater treatment plants, clean-up activities in high-polluted karst caves should be performed, predominately on areas where direct effect on underground fauna was or will be established. Further improvement on technical solutions for prevention of underground pollution also outside Natura 2000 areas should be reinforced and inspection and direct surveillance in nature should also be enhanced (costs included in chapter E.1.2) predominately on areas where effect on underground fauna are/will be evident.

Active management measures are required to avoid further deterioration and improve structures and functions of the following areas covered by Annex I rocky habitats. Majority of these measures focuses on management of visitor access and other forms of recreation. Recreation is becoming major problem in these areas, because of the number of visitors and their insufficient awareness. Consequently, managing of these areas involves communication efforts to educate recreational users or other public so they will either recreate appropriately like correct passing through scree slopes. Also people should be informed where is better to avoid the endangered areas of Natura 2000 sites (included in chapter E.1.5).

An Additional research for specifying the occurrences and the extent of some habitat types and on silicate base ground types should be implemented (included in chapter E.1.3). Communication with relevant stakeholders (via guidance and encouragement) should be enhanced with different set of activities (costs included in chapter E.1.2 & E.1.4).

Prioritization of measures to be implemented during the next MFF period

All the above listed measures are considered as priority.

List of prioritized measures to be carried out, and estimated costs for these measures

- within Natura 2000 sites designated for the targeted habitats and species

Name and short description of the measures	Type of measure*	Target (Unit & quantity)	Estimated cost in Euros (annualised)	Possible EU co-funding source
Analysis and evaluation of surface and subsurface pressures on caves and cave species, especially priority species <i>Proteus anguinus</i> and endemic (sub)species black olm (<i>Proteus anguinus parkelj</i>), needed for detailed planning and pin-pointing of measures and implementation of priority conservation measures.	One-off		275.000 – 450.000	LIFE, ERDF
Advancement in technology for wastewater treatment and in technology for prevention of pollution of underground caves and impact on underground fauna that goes beyond the statutory environmental policy standards on areas where the habitat of underground fauna is at risk	One-off		45 000 – 75 000	LIFE, ERDF
Clean-up activities in high-polluted karst caves, where the habitat of endemic and protected underground species is at risk	Recurring	Clean-up of 5 highly polluted caves within Natura 2000 sites per year	120.000 – 190.000	LIFE, ERDF
Evaluation of environmental pressures to mountain habitats by mountain huts (for HT 8120, 8160, 8210, 8220 & 8240)	One-off	Mountain huts within high-mountain Natura 2000 sites	10.000 – 20.000	LIFE, ERDF
Evaluation of erosion due to the mountaineering activities in high-mountain Natura 2000 sites (for HT 8120, 8160, 8210, 8220 & 8240)	Recurring	Most visited mountaineering pathways	36.000 – 58.000	LIFE, ERDF
Ecological succession within the areas of last glaciaton	One-off	Triglav Plateau, Skuta Plateau, Kanin Plateau	5.000 – 10.000	LIFE, ERDF
Evaluation of habitat loss within ice caves and assessment of cave fauna in ice caves within high karst plateaus (for HT 8240, 8310 & 8340)	Recurring	5 ice caves within Natura 2000 network	24.000 – 39.000	LIFE, HORIZON EUROPE, ERDF

- additional measures beyond Natura 2000 (wider green infrastructure measures)

Name and short description of the measures	Type of measure*	Target (Unit & quantity)	Estimated cost in Euros (annualised)	Possible EU co-funding source
Further improvement on technical solutions for prevention of underground pollution to go beyond the statutory environmental policy standards with special emphasis on habitat requirements of underground fauna	One-off		45 000 – 75 000	
Visitor access to caves outside Natura 2000	One-off		35 000 – 50 000	

* indicate whether the measure is recurring or one-off

Expected results for targeted species and habitat types:

- Caves as a habitat type and the associated fauna in a favourable conservation status.
- Improved knowledge on potential pollutants of subterranean habitats.
- Rocky habitats and sparsely vegetated lands in a favourable conservation status.
- Improvement on awareness of fragility and preservation of habitats in question.

Expected results: other benefits

A raised awareness of mountaineers, cave visitors and other public about the importance of diversity in nature and in preservation of different habitats, also improvement of long-term tourism is expected. Measures will contribute to the overall protection of biodiversity, enhance ecosystem services and mitigate climate changes.

E.2.8. Freshwater habitats (rivers and lakes)

Current status of habitats and species, conservation measures taken until now and their impact so far, remaining pressures and threats

Among the freshwater habitats types listed in Annex 1 of the Habitats Directive ten (10) are occurring in Slovenia and are depending on active management. These are:

- 3130 Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoeto-Nanojuncetea*
- 3140 Hard oligo-mesotrophic waters with benthic vegetation of *Chara spp*
- 3150 Natural eutrophic lakes with *Magnopotamion* or *Hydrocharition* type vegetation
- 3160 Natural dystrophic lakes and ponds
- 3180 Turloughs
- 3220 Alpine rivers and the herbaceous vegetation along their banks
- 3230 Alpine rivers and their ligneous vegetation with *Myricaria germanica*

- 3240 Alpine rivers and their ligneous vegetation with *Salix elaeagnos*
 3260 Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitriche-Batrachion* vegetation
 3270 Rivers with muddy banks with *Chenopodion rubri* pp and *Bidention* pp vegetation

Range of above listed freshwater habitats (rivers and lakes) in Slovenia are considered as favourable with mostly a stable trend, except three habitats HT 3230, HT 3230 and HT 3270 whose ranges are set as unfavourable – bad. While three out of ten habitats keep an overall favourable state with a stable trend; these are: HT 3150, HT 3160 and HT 3080 in continental region. Seven habitats have under “structure and functions” a status of unfavourable-inadequate, these are: HT 3140, HT 3150, HT 3180 alpine region, HT 3240 and HT 3260, all mostly with declining trend. For HT3270 and HT 3130 status for “structure and function” is unknown. Status of freshwater habitats further degrades under section area. Therefore overall assessment for freshwater habitats (rivers and lakes) HT 3150 alpine region, HT 3160 and HT 3180 continental region are in a good condition and therefore have a status as favourable with a stable trend. Habitats 3180 alpine region and HT 3260 continental region overall assessment is as unfavourable-inadequate, where trend for HT 3180 is increasing, for HT 3260 is decreasing. All other freshwater habitats divided regionally have an overall assessment as unfavourable – bad. Therefore eleven habitats divided regionally have the lowest configuration and are therefore under biggest stress. This makes freshwater habitats besides grassland habitats in the second worst state. Assessment of habitat states are summarize from the most recent available report on the conservation of habitats and species under Habitats Directive for ("Article 17 report" period 2013-2018), provided by IRSNC.

While most of freshwater habitats in Slovenia are in unfavourable – bad state, their threats and pressures are plentiful but similar. Threats that influence freshwater habitats (rivers and lakes) are as followed: conversion of natural and semi-natural non-agricultural habitats into agricultural land or from one type of agricultural land use to another. Other threats are changes in terrain and surface of agricultural areas, abandonment of grassland management, inappropriate techniques or timing of mowing, intensive grazing or overgrazing by livestock on one hand and extensive grazing or under-grazing by livestock on other hand. Further agricultural threats that influence freshwater habitats are reseeding, application of natural or synthetic (mineral) fertilisers on agricultural land, use of plant protection chemicals in agriculture, drainage for use as agricultural land and modification of hydrological flow or physical alteration of water bodies for agricultural purposes. Other influential threats are also: conversion to forest from other land uses, thinning of tree layer and extraction of minerals (e.g. gravel, rocks...). Besides agricultural threats there are also large threats from urban usage, like hydropower generation including development and use of associated infrastructure, construction and operation of roads, paths, railroads and related infrastructure, conversion from other land uses to housing, discharge of urban waste water, other residential and recreational activities and structures that generating point pollution to surface or ground waters, sports, tourism and leisure activities, modification of flooding regimes, flood protection or other modification of hydrological conditions for residential or recreational development. Other threats are also modification of hydrological flow or physical alteration of water bodies. Additional threats to freshwater habitats come from abstraction of water, flow deviation, development and operation of dams and reservoirs and other changes to the physical structure of water bodies or hydrological flow or triggered by freshwater aquaculture. Abiotic natural processes (e.g. erosion, silting up, drying out, submersion, and salinization), natural succession resulting in species composition change and invasive alien species are threats that also represent significant impact. Along with all mentioned threats in freshwater habitats natural fires are also a big hazard and additional threat. Furthermore freshwater habitats are also under serious threat from climate change especially from droughts and decreases in precipitation in correlation to temperature changes (e.g. temperature extremes).

Species of the Habitats Directive and birds listed in Annex I of the Birds directive are living, feeding and/or breeding in water habitats – either flowing waters (springs, streams, rivers) or stranding waters (ponds or lakes) or in vegetation surrounding these waters. List of species dependent on water habitats for which measures are identified is in Appendix 1 to this document.

Measures needed to maintain or restore favourable conservation status

Because of state and quantity of threats that freshwater habitats are under, active management measures are crucial to avoid further deterioration and improve condition and functions of the following areas covered by Annex I freshwater habitats. One of the most common and important measure is renaturation of streams (e.g. Mirna, Drava, Mura, Sotla, Voglajna), which includes restoration of river bed and river banks, by opening and renaturation of oxbows, renaturation or removal of vegetation and creation of suitable habitats for water species (list of species in Appendix 3 to this document). Connectivity of habitats and fish populations should be restored, e.g with fish passes or removal of obstacles (dams) where necessary and possible within Natura 2000 sites and outside Natura 2000 sites. Planning and implementation of measures for creation and improvement of habitat connectivity of freshwater habitats for species not listed on annexes of HD (e.g. European eel *Anguilla Anguilla*) should also be enhanced.

As the last resort, a measure to address the decrease of native species of fish in their natural habitat is to increase the breeding capabilities of native fish populations by supportive breeding where needed or where analysis will show that other conservation measures are not sufficient.

On the other hand, invasive alien species represent a treat to indigenous species (either by competing for same habitat, food source, by predation...) therefore measures for removal of invasive alien species are necessary.

Threats on water quality should be addressed with measures taken through legislation already included under protection measures for other habitats. Again more intensive control from inspectorate for environment and spatial planning is essential and needs to be implemented through the entire sector for nature management (costs included in included in chapter E.1.2).

Effect of water abstractions on habitat of water species and guidelines for the management should be stipulated to ensure coherence between agricultural development plans (irrigation) and ensuring long-term favourable conservation statuses of water species and their habitats.

Prioritization of measures to be implemented during the next MFF period

Although all measures are considered as priority, measures that directly contribute to the improvement of habitats with unfavourable conservation status or measures that have a positive influence on endangered species have a greater importance and will be considered first.

List of prioritized measures to be carried out, and estimated costs for these measures

- within Natura 2000 sites designated for the targeted habitats and species (listed in Appendix 1 to this document)

Name and short description of the measures	Type of measure*	Target (Unit & quantity)	Estimated cost in Euros (annualised)	Possible EU co-funding source
Renaturation of streams - opening, renaturation of oxbows and riverbanks, creation of suitable habitats (Appendix 3 to this document)	One-off	42.3 km	4.8 M – 7.8 M	ERDF, LIFE, EMFF
Creation of fish passes in freshwater habitats (e.g. Bača, Krka, Ljubljana, Sora Škofja Loka - jez Goričane, Ljubljana - Gradaščica - Mali Graben, Poljanska Sora Log - Škofja Loka) (Appendix 3 to this document)	One-off	14 passes	0.6 M – 1 M	ERDF, LIFE, EMFF
Reinforcement of native fish populations by supportive breeding	Recurring		2 M – 3 M	ERDF, LIFE, EMFF
Effect of water abstractions on habitat of fish species and guidelines for the management (e.g. Italian barbel (<i>Barbus plebejus</i>) in Natura 2000 area Slovenska Istra & asp (<i>Leuciscus aspius</i>) in Krka s pritoki)	One-off		25 000 – 35 000	LIFE, EMFF
Removal of invasive alien species of crayfish	Recurring		150 000 – 200 000	ERDF, LIFE
Removal of invasive alien species of fish (e.g. on natural eutrophic lakes with Magnopotamion or Hydrocharition & Turloughs)	Recurring		150 000 – 250 000	ERDF, LIFE
Restoration of habitats and preparation of management plans in selected Natura 2000 sites (e.g. HT 3130 and 3150: Rački ribniki – Požeg & Črete (management and restoration); Podvinci (management), Velovlek (management & restoration))	Recurring		0.6 M – 0,8 M	ERDF, LIFE

* indicate whether the measure is recurring or one-off

- additional measures beyond Natura 2000 (wider green infrastructure measures)

Name and short description of the measures	Type of measure*	Target (Unit & quantity)	Estimated cost in Euros (annualised)	Possible EU co-funding source
Creation of habitat connectivity with fish passes in freshwater habitats for species not listed on HD (e.g. European eel <i>Anguilla anguilla</i>)	One-off		350 000 – 450 000	LIFE, ERDF
Priority measures coming out of the Natura 2000 Management programme 2021-2027, that can't yet be defined	Recurring		100 000 – 150 000	

Expected results for targeted species and habitat types:

- Better status of freshwater habitats and turning positive trend.
- Renaturation of river banks
- Stable trend of native fish populations with stable breeding stock in fish farms.
- Restoration of habitats in extensively managed fishponds and their management
- River banks without invasive alien species or with their decreased influence.

Expected results: other benefits

- Public awareness of fragility and protection of freshwater habitats.
- Higher public awareness of the importance of these habitats which reduce and prevent water pollution.
- Measures will contribute to the overall protection of biodiversity, enhance ecosystem services and increase resilience to mitigate impacts of climate changes (floods, droughts, local weather).

E.2.9. Others

Current status of habitats and species, conservation measures taken until now and their impact so far, remaining pressures and threats

In this chapter we included urban ecosystems and cultural landscape that combine several different ecosystems or its parts (hedges, drywalls, structures in urban ecosystems and ponds – karstic, alpine and “fire” ponds). Most ecosystems include

habitat types listed in Annex 1 of the Habitats Directive and/or represent important habitats of species of the Habitats Directive and Bird Directive.

Hedges and drywalls are important habitats of several animal and plant species, while also being an important element in the cultural landscape. They are

- wintering and summer hiding grounds of amphibians, reptiles and small mammals,
- nesting habitats for birds,
- important larval host plants for many butterflies,
- feeding grounds and hiding places for adult dragonflies,
- as linear structures they act as important connecting habitat for species like bats and several invertebrates.

Small ponds that are historically connected to livestock or water supply for washing, even drinking, are in addition to being important as permanent or temporary habitat for many plant and animal species (amphibians, dragonflies, invertebrates, they are also an important cultural heritage.

In urban ecosystems in Slovenia most important structures of habitats include building (churches, castles, houses, electric poles and chimneys) that are important summer breeding habitats for several bat species and breeding habitats for some owls, swifts, pigeons and doves, swallows and house martins. Several bat species are qualified as species with unfavourable conservation status, based on diminishing of their maternity roost habitat.

Measures needed to maintain or restore favourable conservation status

Monitoring of bats from y.2006-2017 has recorded over 100 bat roosts in building destroyed and damaged thus approximately 17 % of all bat monitoring sites in buildings has been classified as in unfavourable state. Conservation status of bat roost in building is equally diminishing inside as outside Natura 2000 areas. Actions are needed for strengthened cooperation with stakeholders (owners of buildings, IRSNC, experts from Institute for the Protection of Cultural Heritage of Slovenia (ZVKDS), MOP, Slovenian environment agency (ARSO)) which will initiate their transformation from stakeholders to partners. Prevention measures for step by step approach are included in integrated LIFE project for nature LIFE17 IPE/SI/000011 - LIFE-IP NATURA.SI and are included in chapter E.3.2.

In areas where "natural" freshwater habitats are not present and man-made ponds represent mayor habitats for pond dependent species, habitat connectivity with network of suitable freshwater habitats should be established / preserved. Only with suitable management (usage) of existing and restoration dried out of ponds in karstic and alpine landscapes a long - term survival of several species of amphibians, dragonflies, plants and invertebrates etc. can be enabled.

Prioritization of measures to be implemented during the next MFF period

The most important measure is improvement and tighter control by the Inspectorate for environment and spatial planning (costs included in chapter E.1.2). Measures that directly contribute to the improvement of habitats with unfavourable conservation status or measures that have a positive influence on endangered species have a greater importance and will be considered as priority.

List of prioritized measures to be carried out, and estimated costs for these measures

- within Natura 2000 sites designated for the targeted habitats and species

Name and short description of the measures	Type of measure*	Target (Unit & quantity)	Estimated cost in Euros (annualised)	Possible EU co-funding source
Creation of habitat connectivity /maintaining the network of suitable habitats for pond dependent species in areas where ponds represent mayor habitats for these species.	One-off	10 ponds per year app 20.000 € per pond	150 000 – 200 000	LIFE, ERDF, EARDF
Agri-environmental schemes for adapted agricultural practices with positive effects on cultural landscape	Recurring	6.700 ha	1 M do 2 M	EARDF
Creation/management of habitat connectivity of suitable habitats for species dependent on Landscape features where they represent mayor habitats for these species.	One-off		250 000 – 300 000	LIFE, ERDF, EARDF

- additional measures beyond Natura 2000 (wider green infrastructure measures)

Name and short description of the measures	Type of measure*	Target (Unit & quantity)	Estimated cost in Euros (annualised)	Possible EU co-funding source
Creation of habitat connectivity for pond dependent species in areas where ponds represent mayor habitats for these species	One-off	5 ponds per year app 20.000 € per pond	80 000 – 130 000	LIFE, ERDF, EARDF
Creation/management of habitat connectivity of suitable habitats for species dependent on Landscape features where they represent mayor habitats for these species.	One-off		180 000 – 230 000	LIFE, ERDF, EARDF

Expected results for targeted species and habitat types

Successful implementation of measures should lead to favourable conservation status of underground habitats, which includes also improvement of water quality. Another important aspect of improvement of habitat is also the reduction of human influence, particularly from tourism. This could be achieved by reducing number of visits per location and/or minimising the human influence during visits (different pathways, better technologies, for example lights with different wave length...).

Expected results: other benefits

Raised public awareness of keeping underground habitats in a good condition, especially the importance of a healthy underground biodiversity. Of equal importance is important understanding of preserving drinking water. Tourism in/around/above caves should be performed in accordance with long-term sustainability and minimal to none influence to the environment.

E.2.10. References for site-related maintenance and restoration measures within and beyond Natura 2000

Information for site-related maintenance and restoration measures within and beyond Natura 2000 costs was provided by following organisations:

MOP	<u>Ministry of the Environment and Spatial Planning</u>
IRSNC	<u>Institute of the Republic of Slovenia for Nature Conservation</u>
ARSO	<u>Slovenian Environment Agency</u>
UL	<u>University of Ljubljana</u>
GIS	<u>The Slovenian Forestry Institute</u>
ZGS	<u>Slovenia Forest Service</u>
NIB	<u>National Institute of Biology</u>
NIB (MBP)	<u>Marine Biological Station Piran</u>
ZZRS	<u>The Fisheries Research Institute of Slovenia</u>
MKGP	<u>Ministry of Agriculture, Forestry and Food</u>
DRSV	<u>Slovenian Water Agency</u>
SKZG	<u>Farmland and Forest Fund of the Republic of Slovenia</u>
SVRK	<u>Government Office for Development and European Cohesion Policy</u>
SIDG	<u>Slovenski državni gozdovi d.o.o. company</u>
ZRC SAZU GIAM	<u>Research Centre of the Slovenian Academy of Sciences and Arts (Anton Melik Geographical Institute)</u>

PAF was presented to the public on 23th of January 2020 where 26 organisations participated. Later on following organisations gave written comments:

IRSOP	<u>Inspectorate for the Environment and Spatial Planning</u>
UL	<u>University of Ljubljana</u>
NIB	<u>National Institute of Biology</u>
ZRC SAZU GIAM	<u>Research centre of the Slovenian Academy of Sciences and Arts (Anton Melik Geographical Institute)</u>
KP	<u>Kozjansko Regional Park</u>
KGZS	<u>Chamber of agriculture and forestry of Slovenia</u>
ZGS	<u>Slovenia Forest Service</u>
MKGP	<u>Ministry of Agriculture, Forestry and Food</u>
IRSNC	<u>Institute of the Republic of Slovenia for Nature Conservation</u>
Zavod Symbiosis, so.p.	<u>Institute symbiosis social enterprise</u>

Information on reporting on The habitat directive and The bird Directive was gained through [European Commission official site - Article 17 web tool – Habitat assessment at Member State level: \(https://nature-art17.eionet.europa.eu/article17/reports2012/habitat/report/?period=5&group=Forests&country=SI®ion=\)](https://nature-art17.eionet.europa.eu/article17/reports2012/habitat/report/?period=5&group=Forests&country=SI®ion=)

European Commission - Mapping and Assessment of Ecosystems and their Services – MAES:
https://ec.europa.eu/environment/nature/knowledge/ecosystem_assessment/index_en.htm

Basic information on operations implemented in Natura 2000 areas were gained thru valid Natura 2000 Management programme (2015 – 2020) whose management is under Ministry of the Environment and Spatial Planning
http://www.natura2000.si/fileadmin/user_upload/C5_ProgrammeNatura2020.pdf

Evaluation of the Conservation Status of Forest Habitat Types (Natura 2000) and Their Forest Management (L. KUTNAR, I. DASKOBLER, 2014) <http://www.dlib.si/stream/URN:NBN:SI:DOC-FKYOGNDZ/00149504-397c-482c-a575-eee442baa139/PDF>

E.3. Additional species-specific measures not related to specific ecosystems or habitats

E.3.1. Species-specific measures and programmes not covered elsewhere

Green infrastructure helps to preserve and improve the state of biodiversity. Taking into account the adopted 2013 EU Green Infrastructure Strategy, Slovenia will continue to establish and maintain green infrastructure. In this strategy, the Natura 2000 network is defined as the “backbone” of green infrastructure in the area of nature conservation, which means source areas for biodiversity revitalization, and the connection of Natura 2000 sites to a wider functional network is important.

In this chapter we included small set of measures of green infrastructure not specially bound to a specific Natura site or habitat type. We included measures for biodiversity in general outside Natura network - mainly for improvement of connectivity of Natura sites and measures to maintain corridors for species not covered elsewhere (like protected species not listed or not listed on Annexes of HD).

Measures needed to maintain or restore favourable conservation status

In Slovenia the Natura 2000 network is considered a priority green infrastructure. The establishment and maintenance of key corridors for mobile species, mainly large carnivores and amphibians, is important for the connectivity of habitats of these species and Natura 2000 areas.

Responsible, proactive, action on land owned by the Republic of Slovenia is important for the good status of species and habitat types within green infrastructure, by continuing targeted action for concrete improvements on agricultural, water and forest areas through systematic and project measures and resources.

Prioritization of measures to be implemented during the next MFF period

All the below listed measures are considered as priority.

List of prioritized measures to be carried out, and estimated costs for these measures

Name and short description of the measures	Type of measure*	Target (Unit & quantity)	Estimated cost in Euros (annualised)	Possible EU co-funding source
Establishing connectivity and maintenance of key corridors for mobile species with concrete conservation measures predominantly on state owned land	One-off	9 projects	0.5 M – 0.8 M	ERDF, LIFE, EARDF
Overpasses for mammals and underpasses/tunnels for amphibians and mammals in accordance with the Strategy Transport Development of the Republic of Slovenia until 2030	One-off	2 x Highway overpasses (10 M), 10x underpasses for amphibians (10 M)	2,5 M – 3,5 M	ERDF, LIFE
Management and conservation of large carnivore populations	Recurring		40 000 – 60 000	ERDF, LIFE
International and intersectorial cooperation for common large carnivore conservation and management	Recurring	Cooperation when producing strategic or management documents, common monitoring and management objectives	50 000 – 100 000	ERDF, LIFE

* indicate whether the measure is recurring or one-off

Expected results for targeted species

- measures for mammals and underpasses/tunnels for amphibians implemented according to the Strategy Transport Development of the Republic of Slovenia until 2030
- at least 9 projects for concrete conservation measures on state owned land for connectivity and maintenance of key corridors for mobile species implemented

- improved connectivity of Natura 2000 network

Expected results: other benefits

- Measures will contribute to the overall protection of biodiversity, enhance ecosystem services and mitigate climate changes.
- Public awareness of fragility and protection of habitats.
- Higher public awareness of the importance of connectivity and resilience of ecosystems

E.3.2. Prevention, mitigation or compensation of damage caused by protected species

Current status in terms of prevention, mitigation and compensation for damages

In accordance with the National Nature Conservation Act and the Rules on the appropriate method of property protection and measures for preventing further damage on human property caused by protected species, payments shall be made in accordance with the reported damage and the approved claims for compensation. The records of damage caused by protected species are kept by the Environmental Agency of the Republic of Slovenia, an authority of the Ministry of the Environment and Spatial Planning. They are also responsible for issuing decisions on the exceptional removal of specimens of protected species. The damage caused by protected animal species is examined by the designated experts of the Slovenian Forest Service.

Because the majority of damage is caused by large carnivores (e.g. brown bear *Ursus arctos* and wolf *Canis lupus*), most of the measures are focused on these two species, either through preventive measures or compensation of damage. Due to the risk of conflicts with humans, both populations have also been subjected to legal culling for controlling the population growth, public safety issues and public acceptance towards co-existence. The quota has been determined case by case (i.e. annually) by the Ministry of the Environment and Spatial Planning through a complex inter-institutional process.

In Slovenia, we have a long history of large carnivore conservation and management, which resulted in effective system of prevention, mitigation and compensation of caused damage. Improvements and capacity building were possible also with the help of LIFE projects (SloWolf - LIFE08 NAT/SLO/000244, LIFE DINALP BEAR - LIFE13 NAT/SI/000550), which were recognised as very successful LIFE projects by the EU. Communication with stakeholders was one of the most important components for success of both projects. Stakeholders learned how to prevent damage efficiently (use of preventive measures like electric nets and/or livestock guarding dogs) and gained new knowledge on damage compensation process and proper requests for damage compensation. As a result of concrete conservation actions in these projects, damage on protected human property decreased and in overall, the conflict rate has not increased despite the increase of large carnivore population. Lessons learnt and best-practice examples from these projects were incorporated in the Action plans for managing of *Ursus arctos* and *Canis lupus* populations in Slovenia. The costs of prevention measures and compensation payments (which are provided by state) are listed below, based on costs for the period 2014-2018.

European beaver (*Castor fiber*) is a species with favourable conservation status by recent report Habitats Directive. Species is in population growth and natural expansion in last decades. Potential conflicts may be arising accordingly since presence of beaver disappeared from the public perception and different stakeholders (e.g. local inhabitants, foresters, farmers, other landowners) are not acquainted with the biology and ecology of the species, its importance and impact in water ecosystems. For now its impact on the environment is not very significant, which is reflected in the relatively low costs of claims for compensation payments for damages. But with the growing population of beavers and their expansion, the number of damage cases in agriculture will probably be increasing and it may become a more resounding problem. A Strategy for the conservation and sustainable management of European beaver (*Castor fiber*) in Slovenia is under preparation. It will define goals, measures for the conservation of beaver in Slovenia and measures for active management of it.

Another group of protected which may cause damages are bats. More than 500 bats' maternity roosts in buildings are recorded in Slovenia, many of them of cultural importance (churches, castles and old buildings). A large proportion or even majority of some bat species (Natura 2000 bat, II annex) are giving birth in these buildings. In some sites bat roost give shelter up to 2000 reproductive females. Inappropriate approaches to solving these problems that arise due to the accumulation of guano in these buildings often lead to destruction or damage of roosts by closing the openings. Regular removal of bat guano with enhanced communication is needed to ensure a better conservation status of bats' in buildings. Actions are needed for strengthened cooperation with stakeholders (owners of buildings, IRSNC, experts from Institute for

the Protection of Cultural Heritage of Slovenia (ZVKDS), MOP, Slovenian environment agency (ARSO)) which will initiate their transformation from stakeholders to partners.

Measures needed

Large carnivores (primarily brown bear and wolf) are the main group of protected species that causes damage to human property. The others are birds (e.g. *Dendrocopos major*, *Sturnus vulgaris*...), rodents (e.g. European beaver) and bats, but they cause damage on smaller scale. Nevertheless all issues should be appropriately addressed and compensation payments should be continuously provided in accordance with the law.

In the next framework, we need to continue adopting current prevention measures, such as direct damage prevention measures, but more effort should be made to increase communication with and education of farmers and other stakeholders (e.g. beekeepers, church owners...), so they will be encouraged for higher tolerance towards co-existence with protected species. This issue could be approached, among other possibilities, top down, where the training in natural conservation topics is provided to agricultural advisors (in case of large carnivores, for example).

Prevention measures in case of bats should aim to minimise or prevent conflict between bats and building owners. Communication with private (or church) building managers should be enhanced and a system of compensation measures regarding additional maintenance needed for building managers due to accumulation of guano, should be put in place. Some measures for step-by-step approach are already included in integrated LIFE project for nature LIFE17 IPE/SI/000011 - LIFE-IP NATURA.SI.

Costs for training, education and awareness rising on above issues are included in chapter E.1.2 and chapter E.1.5.

Prioritization of measures to be implemented during the next MFF period

All measures are considered as priority.

List of prioritized measures to be carried out, and estimated costs for these measures

Name and short description of the measures	Type of measure*	Target (Unit & quantity)	Estimated cost in Euros (annualised)	Possible EU co-funding source
Education, trainings and experience exchange for farmers, agricultural advisors, damage inspection personnel of Slovenia Forest Service, and other stakeholders regarding large carnivore damage mitigation	Recurring		35 000 -60 000	LIFE, ERDF, ESF, EARDF
Prevention measures against damages caused by large carnivores, funded from KOPOP (agri-environmental measures)	Recurring		0.6 M – 0.7 M	EARDF
Implementation of the prevention, mitigation or compensation measures listed in the Strategy for the conservation and sustainable management of European beaver in Slovenia	Recurring		50 000 – 100 000	LIFE, EARDF
Prevention, mitigation or compensation of damage caused by protected species of bats	Recurring		25 000 – 40 000	LIFE
Measures for preventing bears from wandering into settlements taken from Action plan for brown bear (<i>Ursus arctos</i>) in Slovenia (intervention group, upgrading of the waste collection system, co-financing of bear-proof composts, removal of overgrowth ...)	Recurring		150 000 – 200 000	LIFE
Compensations, related to damages caused by large carnivores	Recurring		400 000 - 600 000	-
Compensations, related to damages caused by birds and other protected species	Recurring		65 000 – 100 000	-

Expected results for targeted species

Implemented measures for preventing damage caused by protected species will reduce conflicts between protected species and farmers, as well as local inhabitants and other land users. Lower level of conflicts influences also on a decreased level of negative information mediated through public media. This will enhance higher acceptance of protected animals, since people would feel less endangered, either in terms of safety or economically. Higher acceptance of protected species furthermore enables their population growth and/or increase in their population range and expansion into new habitats. Reduced conflicts will thus have a positive impact on socioeconomic carrying capacity of protected species, as well as contribute to a favourable conservation status of those populations in the long-term.

Implemented measures will also improve the habitat of the bat populations with the increase of suitable coverage, food availability, breeding areas etc., which will have a long-term positive effect on those species.

Expected results: other benefits

The implemented measures will reduce damages caused by large carnivores, which will have a direct positive impact on the economy of farmers and also an indirect impact on more competitive agriculture with higher added value. Farmers living in areas with large carnivore presence will be informed on effective prevention measures and effective farm management in those areas.

Decreased damage levels mean also less people involved in the assessment of damage (less working hours), so more effort can be directed to education and awareness rising of local inhabitants.

Simple prevention measures that minimise conflict between bats and building owners are put in place, and a system for damage compensations is established. Strengthened cooperation between owners /managers of buildings with bats colonies and nature conservation organizations.

E.3.3. References for additional species-specific measures not related to specific ecosystems or habitats

Data for prevention, mitigation and damage compensation caused by protected species was gained from ARSO, MKGP and LIFE-IP NATURA.SI.

Source of data for Green infrastructure and connectivity and maintenance of key corridors was gained from:

- Strategy Transport Development of the Republic of Slovenia until 2030^{17 18}
- Resolution on the National Environmental Protection Program 2020-2030 (ReNPVO20-30) – motion under consideration in the National Assembly¹⁹

PAF was presented to the public on 23th of January 2020 where 26 organisations participated. Later on following organisations gave written comments:

ZGS	<u>Slovenia Forest Service</u>
MKGP	<u>Ministry of Agriculture, Forestry and Food</u>
IRSNC	<u>Institute of the Republic of Slovenia for Nature Conservation</u>
ZRC SAZU GIAM	<u>Research centre of the Slovenian Academy of Sciences and Arts (Anton Melik Geographical Institute)</u>

¹⁷ Strategija razvoja prometa v Republiki Sloveniji do leta 2030 <https://www.gov.si/assets/ministrstva/MzI/Dokumenti/Strategija-razvoja-prometa-v-Republiki-Sloveniji-do-leta-2030.pdf>

¹⁸ operativni-nacrt-2020-2025-brez-povezav-04102019.xlsx

¹⁹ Resolucija o Nacionalnem programu varstva okolja za obdobje 2020–2030

F. Further added values of the prioritized measures

Prioritised action frameworks programme determines measures which facilitate exploiting the opportunities at Natura 2000 sites for local and regional development, jobs and economic growth, and cultural heritage preservation taking into account the economic, social, cultural and demographic characteristics, and sustainable development principles. It also determines activities for the elimination of insufficient required research, expertise, data and monitoring.

Additionally to improvement of conservation status of species and habitat types conservation measures listed above will help to improve, maintain or create resilient ecosystems. Healthy and well-functioning ecosystems can mitigate natural disasters and disruptions (eg, climate change) and most importantly maintain the ability to provide multifunctional ecosystem services. Ecosystem services result from ecosystem processes and are the actual contribution of ecosystem components to human well-being. Ecosystem services are the natural processes nature provides for free, and from which we benefit. They include services like fresh water filtration and allocation, soil maintenance, erosion and flood control, and the role the environment has to play in the maintenance of food stocks (e.g. cattle, fish). Through its services, nature supports economic sectors such as agriculture, fisheries, forestry, tourism, pharmacy, food and beverages, and there are a number of other sectors, for example healthcare directly dependent on nature services. Probably obvious but yet clearly emphasized is the fact that healthy and well-functioning ecosystems are also pleasant to stay-in and see and one of immediate economic impacts contribution conservation of nature makes to regional wealth and employment, largely through tourism, is also underestimated in the public. Despite all the services provided by nature, they are often not recognized since they do not appear on the market, leaving them overlooked in decision-making processes in politics, the economy, local communities, and ultimately in individual decisions. In other words, nature is almost invisible in making key development decisions.

For example three thirds of Slovenia's surface is karst where occurrences on the surface may directly affect the quality of the underground water. It is a very vulnerable ecosystem because it has weak self-cleaning capabilities and on the other hand it is an immense reservoir of drinking water for the wider region. Several measures are proposed for caves and all ecosystems above caves (forest, grasslands etc.) that also address these challenges.

Public awareness about the importance of biodiversity for human wellbeing is included in several measures listed above. One of important objectives of PAF is that importance of biodiversity for human wellbeing and acceptance of measures needed achieve that will increase. In order to continue to improve the conservation status of species and habitat types, the interpretation of the importance of successfully conserving biodiversity will be further strengthened in the future to provide key ecosystem services.

Conservation measures will not only contribute to the improvement of biodiversity in general but also contribute to preservation of cultural values e.g. traditional living patterns in rural areas. Measures will balance commercial and non-commercial development processes in areas with the highest biodiversity values. Agri-environmental measures on sites with minimal or moderate human presence are intended to attain the objectives of Natura 2000 but also help to maintain farming or settlement in these areas. Measure for promotion of nature-friendly land use will be reflected in consumption of thus produced products and services (e.g. the development of trademarks of protected areas, traditional cultural products and services).

Over time, capacity building of key stakeholders and positive impacts of effectively implemented measures on other sectors will contribute to increasing the social acceptability of needed different, sometimes innovative and unconventional approaches within certain sectors.

The added value of above listed measures is also evident in the long-term sustainability of rural areas, which in the next perspective should focus primarily on activity oriented towards nature-friendly management. Measures listed in this document will provide jobs – directly green jobs will be provided through different concrete conservation projects and indirectly through increased need for private and social services (e.g. school, post, bank...) in the (usually rural) areas where implementation of measures will take place.