PRIORITISED ACTION FRAMEWORK (PAF) FOR NATURA 2000 in Latvia

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

Version 2.0*

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** Version 2.0: Table A "Summary of priority financing needs for the period 2021–2027" mathematical errors have been corrected.*

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 European Union's (EU) funding programmes. In line with the objectives of the EU Habitats Directive[1] 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 Directive[2], which requires the EU Member States to send, as appropriate, to the Commission their estimates relating to the EU 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.*

PAFs 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/EEC[3], 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 2000[5] the European Court of Auditors concluded that the first completed PAFs (for the Multiannual Financing Framework 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

[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 other 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

Member States provide in their PAFs. The recent EU Action plan for nature, people and the economy[6] 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 plan[7], 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 Parliament[8].

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 into 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 into eight classes is very largely based on the MAES typology, which was established as a conceptual basis for an EU wide ecosystem assessment[9]. 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 website[10]. 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.

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[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 Latvia

The current PAF covers funding needs for the conservation measures of the Latvian Natura 2000 network as well as measures necessary for the achievement of the favourable conservation status of the species and habitats of the EU importance. Although distribution of the species and habitats may be uneven in the country, the PAF covers the whole country.

The territory of Latvia belongs to the Baltic Sea and Boreal biogeographical region of the EU.

Environmental protection in Latvia has been centralized since 1993, and the Ministry of Environmental Protection and Regional Development (MEPRD) is the main Latvian authority responsible for design, implementation and enforcement of environmental policy, including nature conservation. The MEPRD:

a. Develops state policy in the following domains: environmental protection, nature conservation, protection and sustainable use of natural resources, climate policy, environmental investments, hydrometeorology, use of subterranean depths;

b. Organises and coordinates implementation of the above-mentioned policies;

c. By means of its subordinated institutions, it controls and implements the above-mentioned policies and environmental legislation, including legal requirements related to environmental protection, nature conservation, climate change, chemicals management, protected areas, extraction of mineral resources, except hydrocarbons;

d. Develops environment monitoring policy and by means of its subordinated institutions is responsible for collection and analysis of environmental data and information and for provision of this information to the public and to international institutions.

In order to ensure unified implementation of the nature protection legislation, in 2009 the Nature Conservation Agency (NCA) was established. The NCA: 1) ensures implementation of the unified nature protection policy in Latvia, 2) is responsible for management of all specially protected natural areas in the country, 3) supervises and controls international trade in endangered species of wild fauna and flora and 4) administers certain types of compensation (to land owners for restrictions on economic activities in the specially protected natural areas as well for damage caused to land owners by the migrating and non-game protected species). Functions of the NCA include planning for the protection of endangered species and habitats and protected territories, as well as organization of the relevant measures to implement such plans, preparation of the proposals to change category of the existing protected areas or to establish new ones, controls of compliance with natural resource protection legislation and controls of trade in endangered species, management of scientific research in protected areas, issuing of permits and consents related to natural resource protection, provision of information to the public and authorities, cooperation with local authorities, entrepreneurs and public as well as educational activities to promote nature conservation.

There is no specific scientific institution dealing with biodiversity research or monitoring on regular basis. Therefore, NCA also coordinates implementation of the biodiversity monitoring and to a large extent also sets the need for the necessary studies and research activities.

Nevertheless, other institutions, municipalities and NGOs are actively participating in Natura 2000 network management. and implements biodiversity issues. Two other institutions subordinated to the MEPRD – Environment State Bureau and State Environmental Service – are competent authorities involved in the process of environmental impact assessment. State Forest Service under the Ministry of Agriculture, for example, establishes microreserves in forest lands and provides their surveillance in accordance with the regulations of forest management and use. Rural Support Service administers national and EU support for the development of agriculture and rural development, int. al. support payments to protected nature territories of EU importance (Natura 2000). Municipalities develop territorial plans, taking into the account Natura 2000 network regulation and participate in some management activities.

Since majority of the Latvian protected areas are included in the Natura 2000 network, NCA is responsible for the management of the Natura 2000 sites either directly, or NCA is entitled to organize necessary management measures. Therefore, the PAF is developed by NCA in close cooperation with the MEPRD and stakeholders taking into the account the following documents:

- Environmental Policy Guidelines 2014–2020, http://www.varam.gov.lv/lat/pol/ppd/vide/?doc=17913;
- 2019 reports under Article 17 of the Habitats Directive and Article 12 of 2013 Birds Directive;
- Monitoring reports on habitats and species of Community interest (https://www.daba.gov.lv/public/lat/dati1/biologiskas_daudzveidibas_monitoringa_dati/);
- Maritime Spatial Planning 2030 (http://www.varam.gov.lv/lat/darbibas_veidi/tap/lv/?doc=23102);
- National Conservation and Management Programme for the Natura 2000 Sites in Latvia, 2018–2030;
- Management plans of the Natura 2000 sites;
- National species management plans.

Documents listed above provided the information on the political priorities and baseline ecological features of the species and habitats of the EU importance. Monitoring reports as well as reports prepared pursuant to the Birds and Habitats directives set the baseline assessment of the conservation status and suggested the conservation measures for the improvement or maintenance of the conservation status.

Important stakeholder consultation took place early in the preparation of the PAF. On 8 February 2019 MEPRD organized workshop on strengthening investments in nature conservation and Natura 2000 through accessing EU funds and updating of the Prioritised Action Frameworks (PAFs). Participants of the workshop represented the major stakeholders: Ministry of Agriculture (in charge of the agriculture, forestry and fishery), Ministry of Finance (in charge of the Cohesion policy), environmental NGOs, representatives of agriculture and forestry business, private landowners, municipalities, etc. During the panel discussion as well as in the break-pout groups participants of the workshop outlined the major achievements of the previous/current funding period as well as emphasized the areas/measures where more funding and more streamlined support should be provided in the next MFF.

Opinions of the stakeholders were also given in the special session of the bilateral meeting between the Latvian authorities and European Commission (EC) that took place on 17–18 September 2019. Although the session with stakeholders did not explicitly tackle the issue of funding of the nature conservation measures, nevertheless the topics and issues mentioned in this session indicated the interests of different stakeholder groups regarding the management of the nature values, necessary improvements of the current management system, areas where additional funding and conservation measures should be provided, etc.

Simultaneously to submission to the EC, the draft PAF was also sent to the Ministry of Agriculture for comments and further elaboration; however, no official feedback was received.

Although there are large number of different elements of the green infrastructure, there is no encompassing national green infrastructure strategy. These elements are:

- protected belts and buffer zones along all waterbodies and streams, in varying width depending on the size of the waterbody itself. Protected belt is also established along the sea cost. Types of the protected belts and their width is provided by the Law on Protected Belts and subordinated regulations;
- Microreserves – small protected areas established mostly for species habitats (breeding and nesting sites);
- Green zones and forests of the cities and municipalities – development of these zones is sole competence of the municipality and are planned and executed in accordance with the territorial development plan of the particular municipality.

PAF establishes the multiannual planning of the measures that are necessary to implement the Natura 2000 network and its associated green infrastructure, specifying the financing needs for these measures. The PAF includes new initiatives and needs to evaluate existing legislation system and Natura 2000 network to propose improvements in legislation and conservation. At the same time, PAF stresses the need to continue existing good practices with some improvements.

Additional remarks based on the 2nd assessment of the draft PAF

PAF does not include measures and activities implementation of which has already started, or which are already funded by the EU Cohesion funds 2014–2020. This concerns the habitat restoration activities, including the habitat for *Osmoderma eremita* (EU Cohesion fund funded project, beneficiary – NCA, implementation of the project 2021–2023).

Majority of the measures included in the PAF are those for which the funding should be sought/provided. It should be also noted that all measures listed in the Section E.2 and E.3 of the PAF should be regarded and implemented in conjunction with the measures listed in the Section E.1. PAF focuses mainly on Natura 2000 sites, bearing in mind that the PAF also foresees the revision of the existing sites and establishment of new sites as appropriate. Revision of the sites and other possible amendments to the Natura 2000 network will be based on the results of the country-wide habitat mapping, approved species management plans, site management plans, etc.

Majority of the PAF measures are habitat-based. Section E.3 lists only those species-related measures which are not associated with specific habitat or ecosystem. The cross-checking on species/habitat relation is provided in the Annexes to the PAF, including references to the PAF measures. In the PAF, measures are planned only for those bird species with decreasing short- or long-term trends (see Annex I). As a clear link between habitat of the EU importance and particular bird species is often hard to establish, linkage is provided on broader ecosystem level. For non-avian species with U1/U2 status assessments, linkage to a particular habitat type is established in cases there are clear preference for certain habitat type (see Annex II). If no clear preference, linkages are provided on broader ecosystem level.

As for priority setting, PAF lists the full list of measures recognized for the improvement of the implementation of the EU nature directives, irrespectively of the funding provided or secured. This is conscious choice since the PAF will be used not only for justifying EU funding, but also for attracting more funding from national sources or via project applications submitted to e.g. LIFE programme. In accordance with the national provisions, NCA is the competent authority not only for drafting the current PAF, but also as a competent authority for Natura 2000 management is consulted on every project idea to be submitted for EU funding (e.g. LIFE, Interreg) or on the shortlisted projects in case of the national funds. As mentioned above, NCA is also in charge of the monitoring of the species/habitats and management of the protected nature areas. Therefore, in case of the shortage of the funding, NCA will be the relevant institution responsible for informing and providing fully justified decisions on possible omission of the certain measures and activities provided in the PAF.

Restoration activities are planned in the areas which are recognized as habitats of the EU importance, although usually of insufficient quality. Although few measures of the PAF mention “creation of new habitats”, it implies the long time needed for development of structures and functions typical for certain habitat type. Even in these cases, land plots suitable for creation of the new habitats already have certain remnants of the habitat type (few typical species, some elements of the needed structure or limited functions). Therefore, all restoration activities listed in the Latvian PAF are to be considered as corresponding to the Type I restoration activities as described in the “Technical paper 2/2020: State of Nature in the EU – Methodological Paper. Methodologies under the Nature Directives Reporting 2013–2018 and analysis for the State of Nature 2000” by ETC/BD.

As for habitat areas both inside and outside Natura 2000, measures of the PAF are mainly focused on the legal obligations regarding the management of the Natura 2000 sites. The management of the existing Natura 2000 sites will be supplemented by the revision of the network and establishment of the new sites, where appropriate. In 2021, Latvia has started the implementation of the LIFE integrated project LIFE 2019 IPE/LV/000010 “Optimising the Governance and Management of the Natura 2000 Protected Areas Network in Latvia“. The project will develop favourable reference values (FRVs) for all habitat types of the EU importance, including the management plan/action plan for achievement of the FRVs. Action plan may include provisions for connectivity, establishment of new protected areas, enhancement of the existing ones, as well as necessary management activities for achieving FRVs. All these aspects will be taken into the account in the analysis of the results of the country-wide habitat mapping. Therefore, measures of the PAF will be revisited when FRVs will be set, and appropriate management/action plans will be developed. Until then, PAF measures will be implemented in the existing Natura 2000 sites or those measures of the horizontal nature.

A. Summary of priority financing needs for the period 2021–2027

		Priority financing needs 2021–2027	
1.	**Horizontal measures and administrative costs related to Natura 2000**	Annual running costs (Euros/year)	One-off / **project costs*** (Euros/year)
1.1.	Site designation and management planning	3,260,000	1,821,470
1.2.	Site administration and communication with stakeholders	6,123,000	1,157,160
1.3.	Monitoring and reporting	1,220,000	614,290
1.4.	Remaining knowledge gaps and research needs	680,000	2,774,310
1.5.	Natura 2000-related communication and awareness raising measures, education and visitor access	75,000	6,857,150
	Sub-total	11,358,000	13,224,380

2.a	**Natura 2000 site-related maintenance and restoration measures for species and habitats**	Annual running costs (Euros/year)	One-off / **project costs*** (Euros/year)
2.1.a	Marine and coastal waters	150,000	628,310
2.2.a	Heathlands and shrubs	340,400	157,790
2.3.a	Bogs, mires, fens and other wetlands	20,000	757,140
2.4.a	Grasslands	4,880,000	500,010
2.5.a	Other agroecosystems (incl. croplands)	-	428,570
2.6.a	Woodlands and forests	7,000,000	2,857,150
2.7.a	Rocky habitats, dunes & sparsely vegetated lands	60,000	128,580
2.8.a	Freshwater habitats (rivers and lakes)	465,000	957,150
2.9.a	Others	-	-
	Sub-total	12,915,400	6,414,700

2.b	**Additional "Green infrastructure" measures beyond Natura 2000 (further improving coherence of the Natura 2000 network, including in a cross-border context)**	Annual running costs (Euros/year)	One-off / **project costs*** (Euros/year)
2.1.b	Marine and coastal waters	18,120,000	49,010
2.2.b	Heathlands and shrubs	52,000	-
2.3.b	Bogs, mires, fens, and other wetlands	30,000	-
2.4.b	Grasslands	6,450,000	-
2.5.b	Other agroecosystems (incl. croplands)	42,902,000	71,430
2.6.b	Woodlands and forests	-	71,430
2.7.b	Rocky habitats, dunes & sparsely vegetated lands	30,000	57,120
2.8.b	Freshwater habitats (rivers and lakes)	235,000	-
2.9.b	Others (caves, etc.)		
	Sub-total	67,819,000	248,990

3.	**Additional species-specific measures not related to specific ecosystems or habitats**	Annual running costs (Euros/year)	One-off / **project costs*** (Euros/year)
3.1	Species-specific measures and programmes not covered elsewhere	60,000	2,714,300
3.2.	Prevention, mitigation or compensation of damage caused by protected species	1,500,000	-
	Sub-total	1,560,000	2,714,300

	Annual total	93,652,400	22,602,370
	Total (2021–2027)	813,783,390	

B. Current state of the Natura 2000 network

C.1. Area statistics of the Natura 2000 network

The Latvian Natura 2000 network consists of 333 terrestrial Natura 2000 sites covering 7,448.1 km2, and 7 marine Natura 2000 sites covering 4,381.7 km^2. (see the table below). Ownership in Natura 2000 areas is as follows: private lands – 43%, state lands – 44%, municipality lands – 13%.

Between 2013 and 2019, the Natura 2000 network in Latvia was expanded by designating one additional site. There are no offshore marine areas.

Area statistic of protected areas and Natura 2000 network below:

Area statistic of protected areas and Natura 2000 sites in Latvia	Area km^2	Percentage of the territory of Latvia
333 Natura 2000 sites *:	11,829.9	12.80%
Natura 2000 terrestrial sites **	7,448.1	11.53%
Natura 2000 marine protected areas ***	4,381.7	15.73%
Total area of nature protected areas *	16,844.1	18.22%
Total area of nature protected areas (without overelapping) *	16,177.8	17.50%
Total area of terrestrial nature protected areas **	12,462.4	19.30%
Total area of terrestrial nature protected areas (without overlapping)**	11,889.2	18.41%
Total area of marine protected areas ***	4,381.7	15.73%
Total area of marine protected areas (without overlapping)***	4,381.7	15.73%
* Area of the territory of Latvia including marine waters covers 92,441.3 km^2		
** Terrestrial area of the territory of Latvia – 64,580.8 km^2		
*** Area of the Latvian marine waters – 27,860 km^2		

Majority of the Latvian Natura 2000 sites are established by the legal act approved either by the Government or the Parliament as national specially protected nature territories; all sites have legally approved border. Specially protected nature territories fall into one of eight categories of protected areas: national park, biosphere reserve, nature park, protected landscape area, nature reserve, strict nature reserve, nature monument, and marine area, with different objectives, area and degree of protection. All categories of protected areas, except for the biosphere reserve, has been designated as Natura 2000 sites. Additionally, several microreserves are designated as Natura 2000 sites. The total area of national protected sites and microreserves is larger than Natura 2000 network area.

As of April 2018, the Natura 2000 network for Latvia is 93.7% complete. Species per group and habitats are listed below.

	Listed in the annexes of the directives	Present in Latvia	Natura 2000 to be established	Natura 2000 completed
Habitats	229	60	60	54
Mammals	53	29	5	4
Amphibians, reptiles	51	14	3	3
Plants	566	22	21	20
Invertebrates	136	34	22	20
Fish	65	13	10	8
Birds	193	219	70	70

At the beginning of the 2020, the Latvian Natura 2000 network was not completed, since there are three species (*Unio crassus, Osmoderma eremita, Barbastella barbastellus*) and 7 habitat types (1 marine, 6 terrestrial) for which there is a need to designate one or more sites of Community importance (see the infringement case 2019/2304).
The main legislation act is The Law On Specially Protected Nature Territories (1993). It specifies: 1) the basic principles for the system of specially protected nature territories, 2) procedures for establishment of specially protected nature territories and securing their existence, 3) procedures for the administration, control of the condition and registration of specially protected nature territories, and 4) combines state, international, regional and private interests in regard to the establishment, preservation, maintenance and protection of specially protected nature territories. It also defines specially protected nature territories as geographically set areas. Strict nature reserves, national parks and biosphere reserves are established by the national parliament (Saeima) by a corresponding law, while nature parks, nature monuments, nature reserves, protected marine territories and protected landscape areas are established by the Cabinet of Ministers.

To ensure protection of the specially protected nature territories and conservation of their natural values, the law gives a mandate for the development of regulations for protection and use of the protected territory. The law provides for general regulations which apply to all specially protected nature territories unless individual regulations are developed. They also determine specific requirements for protection and use of the particular territory depending on the category of the protected territory.

General regulations set uniform conditions for economic activities and the so-called “code of conduct” to be complied with in all the protected territories belonging to the same category. Specific conditions for a specific territory may be set and deviations from the general regulations may be allowed only by means of individual regulations. The individual regulations set conditions and determines activities that are necessary for conservation of natural values, but do not impact application of other legislative acts of a general character, e.g. regulations in the field of construction, fire safety, etc. Functional zoning of the certain territory that foresees different requirements for its protection and use is also included in the individual regulations, if necessary. Both general and individual regulations are approved by the Cabinet of Ministers.

In order to embed the requirements of the EU regulations that have been set by the EU Birds and Habitats Directives for protection of species and biotopes (habitats), in 2000 the Law on the Conservation of Species and Biotopes was approved. This law aims at: 1) ensuring biodiversity through the conservation of fauna, flora and biotopes (habitats); 2) regulating the conservation, management and supervision of species and habitats; 3) promoting the preservation of populations and habitats in accordance with economic and social preconditions, as well as cultural and historical traditions; 4) regulating procedures for the determination

of the specially protected species and habitats, and 5) ensuring the performance of the necessary measures in order to maintain the number of populations of bird species living in the wild pursuant to the requirements of ecology, science, culture and taking into account the requirements of economic activities and recreation or in order to facilitate the approximation of the population of these species to the referred level. The law refers to specially protected habitats and plant, fungi, lichen, and animal species, including birds, their habitats, and individuals at all stages of their development. The scope of this law is also set on international trade with specimen of endangered wild animal and plant species.

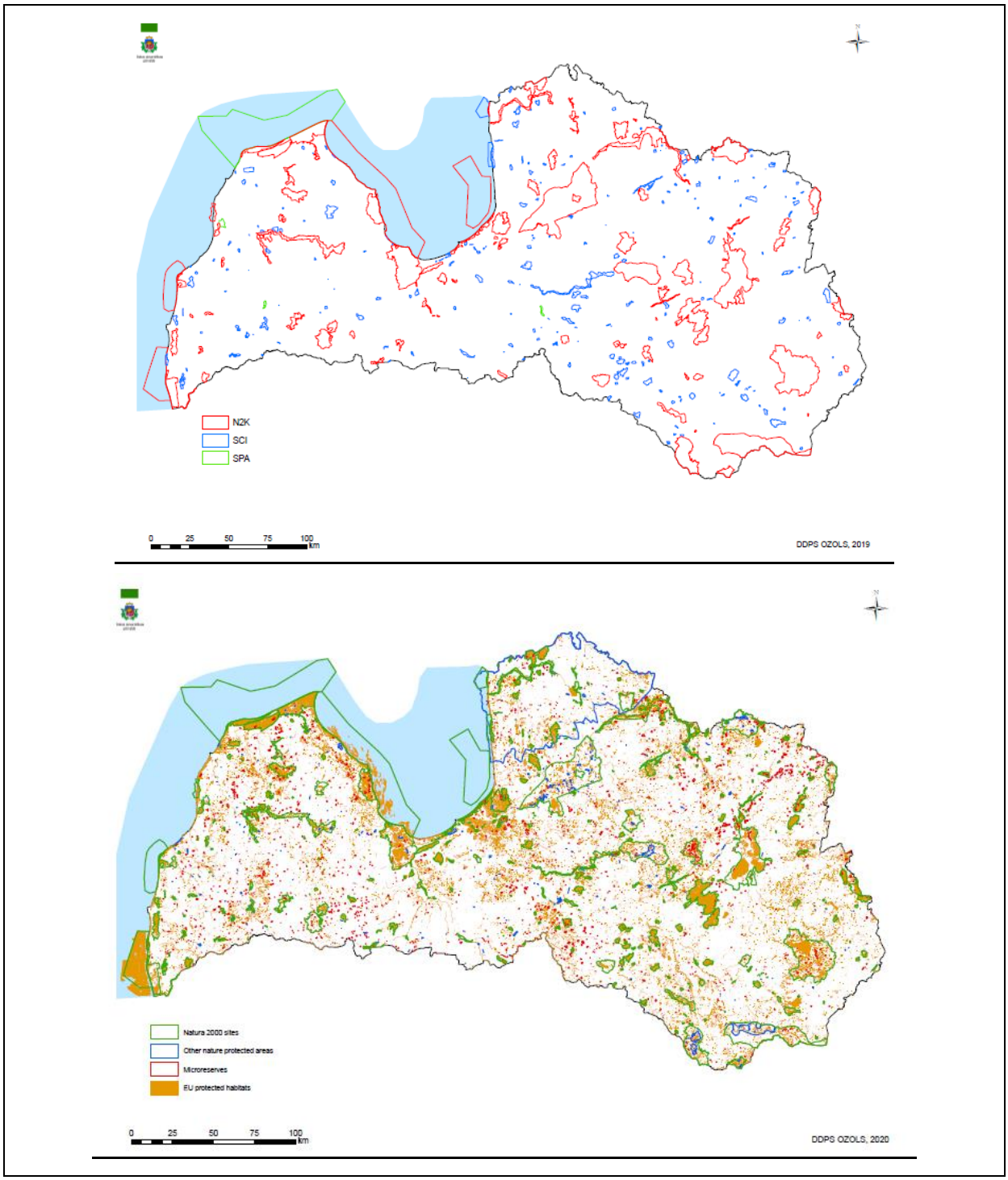
The Law on the Conservation of Species and Biotopes introduces the concept of favourable conservation status. It is stated in this law that the task of species conservation is to provide conditions that have a positive impact and promote optimal distribution of its population and the number of individuals in it.

In order to provide protection to the specially protected species and habitats outside and within specially protected nature territories (in cases when the functional zoning does not provide sufficient protection), microreserves can be established. Microreserves have a limited area. Lists of species and habitat types for whose protection microreserves can be established and are approved by regulations of the Cabinet of Ministers. Microreserves are established by the responsible institutions of the corresponding field depending on the land use of the area in question. Detailed requirements that define the specially protected species and those of a limited use in Latvia, specially protected habitat types and others have been defined in regulations of the Cabinet of Ministers. The Law on the Conservation of Species and Biotopes and Law on Specially Protected Nature Territories and the subordinate legislative acts set requirements in the field of nature protection that is binding to all landowners.

	Natura 2000 area data per EU Member State (in km^2)						**Proportion (in %) of the land area covered by:**		
	Terrestrial			**Marine**					
Name of region	**SCI**	**SPA**	**N2K**	**SCI**	**SPA**	**N2K**	**SCI**	**SPA**	**N2K**
Total	**839.68**	**25.09**	**6582.30**	**106.90**	**1724.12**	**2550.72146**	**1.30**	**0.039**	**10.19**

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

Here is a link to the Nature Data Base "Ozols" where all relevant biodiversity data are available for public access: https://ozols.gov.lv/pub.



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 assess to what extent the financial needs of Natura 2000 are currently met and what the funding gap is.

Please note that some of the measures and funding below cover whole country thus share of Natura 2000 sites covered by these measures is mathematically calculated and not necessarily corresponds to the real spending!

D.1. European Agricultural Fund for Rural Development (EAFRD)*

Total allocation from the EAFRD to the Member State/region: **1,075,603 ,782 EUR**

Measure	Total current allocation to the EAFRD measure, EUR		Current allocation to actions or sub-measures relevant for Natura 2000, EUR		Current spending on actions or sub-measures relevant for Natura 2000, EUR		Comments (relevance, experience to-date, challenges for the next period)
	EU	National	EU	National	EU	National	
M10 Agri-environment climate measures	56,976,941	26,812,678	56,976,941	26,812,678 + 2,500,000 top-up to *M10.1.1. (additional national funding*)	55,110,016	25,934,125	The only measure related to the nature directives within M10 is area-based payment for **management of biologically valuable grasslands** (M10.1.1), the total allocation for this measure – 18,702,670 EUR. Supporting measure for biologically valuable grasslands applies to all grassland habitats of the Habitats Directive present in Latvia. Measure applies both to areas inside and outside Natura 2000, since the measure facilitates the management of the grassland habitats thus contributing to the maintenance of the conservation status. These measures are recommended to continue in the next programming period to support management of seminatural grasslands.
M12 Natura 2000 payments	16,383,726	7,709,988	16,383,726	7,709,988 + 2,000,000 top-up *(additional national funding)*	11,389,418	5,359,726	Area-based Natura 2000 compensatory payments (forests). These measures are recommended to continue in the next programming period.
Other measures	55,848						Ministry of Agriculture has allocated budget from the RDP technical assistance for Nature Conservation Agency to analyse and prepare habitat data for agri-environmental payments for semi-natural grassland management.
Subtotal	73,416,515	34,522,666	73,360,667	39,022,666	66,499,434	31,293,851	
TOTAL	**107,939,181**		**112,383,333**		**97,793,285**		

* Data in the table provide information on the spending covering period from 01.01.2014 to 31.12.2019.

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

The total allocation from the ERDF to the Member State/region: **2,401,252,453 EUR**

The total allocation from the CF to the Member State/region: **1,349,414,695 EUR**

Category of intervention	Allocation to measures relevant for Natura 2000, EUR		Current spending on measures relevant for Natura 2000, EUR		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	28,302,250 **(11,723,624 in Natura 2000)**	4,994,515 **(2,068,875 in Natura 2000)**	9,380,397 **(5,325,515 in Natura 2000)**	1,658,012 **(939,796 in Natura 2000)**	- Mapping of EU importance habitats in the whole country, collection of information to improve Natura 2000 network and connectivity between Natura 2000 sites. - Development of 5 species management plans and 25 site management plans. - Development of 3 environmental education centres. - Restoration of habitats, mainly in Natura 2000 sites. (Programmes: „Measures for restoration of the favourable status of habitats and species" (5.4.3.) CF funding; "Ensure development of environmental monitoring and control system and timely prevention of environmental risks, as well as public participation in environmental management" (5.4.2.) CF funding).
86 Protection, restoration and sustainable use of Natura 2000	**3,400,000 €**	**600,000 €**	**3,072,721 €**	**715,034 €**	Measure aimed to regulate tourism pressure in Natura 2000 sites. Tourism infrastructure developed in sites where Natura 2000 management plans are in place. (Programme: "Restoring biodiversity and protecting ecosystems" measure "Construction of anthropogenic load reducing infrastructure in Natura 2000 sites" (5.4.1.1) ERDF funding).
Subtotal	**15,123,624**	**2,668,875**	**8,398,236**	**1 654 830**	
TOTAL	**17,792,499**		**10,053,066**		

* Data in the table provide information on the spending covering period from 01.01.2014 to 31.12.2019.

D.3. European Maritime and Fisheries Fund (EMFF)*

The total allocation from the EMFF to the Member State: **139,833,742 EUR**

Measure	Allocation to measures relevant for Natura 2000, EUR		Current spending on measures relevant for Natura 2000, EUR		Comments (relevance, experience to-date, challenges for the next period)
	EU	National	EU	National	
Priority 6. Improving knowledge of the state of the marine environment	**2,653,759**	0	**1,592,255**	0	Part of the project that focuses on improving knowledge of the marine ecosystem, the state of the marine environment, and the pressures that affect it, both in Natura 2000 and outside.
Priority 2. Promoting environmentally sustainable, resource efficient, innovative, competitive and knowledge based aquaculture / F022.10 - Aquaculture providing environmental services	**4,028,770**	**1,342,923**	**2,236,455**	**745,485**	Payments for compliance with aquatic environmental requirements that exceeds EU and national legislation (calculated only for ponds in Natura 2000 sites). 2014–2020 the available public funding for Action F022.10 – Aquaculture providing environmental services is - EUR 8,666,667. The figure on the left applies to the part of the support provided for Natura 2000 sites.
Subtotal	**6,682,529**	**1,342,923**	**3,828,710**	**745,485**	
TOTAL	**8,025,452**		**4,574,195**		

* Data in the table provide information on the spending covering period from 01.01.2014 to 31.12.2019.

D.4. LIFE Programme (2014–2020)

Type of project or financing instrument	Current allocation to measures relevant for Natura 2000, EUR		Comments (number of projects, relevance, experience to-date, challenges for the next period)
	EU	National	
Traditional projects	3,862,599	777,074	2 LIFE projects have been approved under subprogramme of NAT and BIO for conservation of biodiversity: GrassLIFE and LIFE CoHaBit (Latvia as a coordinating beneficiary). Projects apply only to Natura 2000 sites.
Integrated projects	0	0	A LIFE integrated project on implementation of Latvia's river basin management plans have been approved. It includes some elements of freshwater habitat restoration. Proposal for an integrated project for implementation of the PAF is in preparation.
Other (NCFF etc.)	0	0	
Subtotal	**3,862,599**	**777,074**	
TOTAL	**4,639,673**		

D.5. Other EU funds, including Interreg

The total EU co-funding allocated from other EU programmes (Interreg) for the implementation of some elements of EU nature policy and associated green infrastructure in the Member State/region: **2,163,108 EUR**.

Total national/regional funding allocated for the co-funding of these measures: **381,725 EUR**.

Please take into the account the essence of Interreg programme. The allocated funding of environmental priorities of the programmes is not dedicated to specific a Member State and, concretely, to the EU Nature Policy/green infrastructure development.

Latvia is a beneficiary of three cross-border operational programmes and one transnational programme. Within these programmes the following projects have contributed 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: a total of 8 projects under Latvia-Lithuania Cross Border Cooperation programme supporting elements of Natura 2000, biodiversity or green infrastructure have been approved in 2014–2020: 7 of them are under Priority 6 (d) "Conserving and restoring biodiversity and soil and promoting ecosystem services including through measures for Natura 2000 and green infrastructure"; 1 – under the priority of sustainable tourism.

Please note that we do not have information on the funding of individual activities within the projects mentioned in this section and only some elements of the projects include implementation of EU nature policy and associated green infrastructure.

LLI-291 Enhancement of green infrastructure in the landscape of lowland rivers (ENGRAVE), 496,996 EUR of EU financing for the project, and 11,758 EUR of national co-financing for partners from Latvia.

LLI-267 Introducing new technologies in near border emergency combat (EMERG_TECH), 499,999 EUR of EU financing for the project, and 48,531 EUR of national co-financing for partners from Latvia.

LLI-306 Conservation of biodiversity in open wetland habitats of the LV-LT cross-border region applying urgent and long-term management measures, 496,995 EUR of EU financing for the project, and 10,792 EUR of national co-financing for partners from Latvia.

LLI-310 Cross-boundary evaluation and management of lamprey stocks in Lithuania and Latvia (LAMPREY), 303,790 EUR of EU financing for the project, and 20,400 EUR of national co-financing for partners from Latvia.

LLI-195 Liquidation of CBRN accidents and pollution in Latvia–Lithuania cross-border area (ATOM), 303,790 EUR of EU financing for the project, and 98,115 EUR of national co-financing for partners from Latvia.

LLI-249 Ecological flow estimation in Latvian–Lithuanian trans-boundary river basins (ECOFLOW), 332,558 EUR of EU financing for the project, and 35,296 EUR of national co-financing for partners from Latvia.

LLI-49 Optimal catch crop solutions to reduce pollution in the transboundary Venta and Lielupe river basins (CATCH POLLUTION), 196,017 EUR of EU financing for the project, and 11,219 EUR of national co-financing for partners from Latvia.

LLI-10 Introducing nature tourism for all (UniGreen), 332,558 EUR of EU financing for the project and 30,176 EUR of national co-financing for partners from Latvia (includes five Nature 2000 sites).

WAMBAF Water Management in Baltic Forests (Interreg Baltic Sea Region Programme 2014–2020). 180,000 EUR of EU financing for a partner from Latvia.

INVALIS Protecting European Biodiversity from Invasive Alien Species (Interreg Europe), 147,481 EUR of EU financing for partner from Latvia, and 25,186 EUR of national co-financing.

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

The total financing allocated to implementation of EU nature policy and associated green infrastructure, for measures or projects not benefiting from any EU co-funding: **37,522,650 EUR**

The following allocations were made from national and regional budgets to Natura 2000, green infrastructure, and species protection:

- Administration costs (budget of Nature Conservation Agency for salaries (experts, inspectors, and project teams working with educational activities, control and management planning activities in Natura 2000 sites, state aids for damage caused by protected animal species as part of NCA budget) – **24,900,302 EUR**. 90% of the total administration costs can be indicatively attributable to the Natura 2000 sites.
- Monitoring of biodiversity, including Natura 2000 sites monitoring **2,318,000 EUR**, 100% attributable to the monitoring of the species and habitats covered by the EU nature directives.
- Information, education and capacity building activities (Latvian Environmental Protection Fund)** – **473,615 EUR**; 100% attributable to the species and habitats covered by the EU nature directives.
- Species and habitats protection measures not co-financed by the EU (Latvian Environmental Protection Fund)** – **3,214,176 EUR**, 100% attributable to the species and habitats covered by the EU nature directives.
- Restoration of spawning grounds; supplement of the fish stock (different species) not co-financed by the EU (Fishery fund) – **631,688 EUR**, 30% attributable to the species and habitats covered by the EU nature directives.
- Capacity building for state institutions for performing fishery control (inland/sea, both inside and outside of Natura2000) (Fishery fund) – **1,173,278 EUR**, 30% attributable to the species and habitats covered by the EU nature directives.
- Forest monitoring and projects related to forest biodiversity (Forestry development fund) – **79,115 EUR**.
- Monitoring of waterbirds and large carnivores, baseline setting for main game animals: national budget (Hunting Development Fund) – **212,450 EUR**, 30% attributable to the species and habitats covered by the EU nature directives.

Data above provide information on the spending covering period from 01.01.2014 to 31.12.2019.

****Latvian Environmental Protection Fund:** 71 projects funded by the end of 2019 related to the implementation of the EU nature policy and associated green infrastructure, including implementation of species management plans, implementation and development of site management plans, restoration of habitats, sustainable management of water bodies. National public campaigns linked to the biodiversity conservation as well as capacity building for Nature Conservation Agency and other relevant institutions are included.

C. 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: 01.01.2020)

The territory of Latvia belongs to the Baltic Sea and Boreal biogeographical regions of the European Union (EU).

Currently there are 333 Natura 2000 sites in Latvia. The latest Natura 2000 site was established on 2013.

The Natura 2000 network in Latvia contributes to the conservation of five EU priority species and 19 EU priority habitat types, as well as large number of other threatened, nationally protected species and habitats.

Several Natura 2000 sites in Latvia are essential for the conservation of threatened bird species that are almost extinct in many EU countries, with still large, though shrinking populations. For example, about 5% of the world's and 8% of the European population of *Ciconia nigra*, as well as 20% of the world's and 24% of European population of *Clanga pomarina* occur in Latvia. The *Crex crex* population in Latvia comprises 25% of the European populations.

The Habitats Directive's Article 17 report (for the period 2013–2018) shows that only 10% of habitat types and 41% of species (other than birds) of the EU importance are in a favourable conservation status in Latvia. The Report covers evaluation of 2 marine and 59 coastal and inland habitat types, and 115 species (34 invertebrate, 14 fish, 14 amphibian and reptile, 30 mammal, 16 vascular plant species (including genera), and 7 non-vascular plant species).

As indicated in Chapter C.1 above, at the beginning of 2020 the Latvian Natura 2000 network was not completed, since there are three species (*Unio crassus, Osmoderma eremita, Barbastella barbastellus*) and 7 habitat types (1 marine, 6 terrestrial) for which there is a need to designate one or more sites of the Community importance (see infringement case 2019/2304). Some of these insufficiencies are based on the initial reference list of the species and habitats, applicable at the accession to the EU. However, based on the latest habitats' interpretation on Latvia, since 2015 three new habitat types have been distinguished in Latvia. These habitat types are 9050 Fennoscandian herb-rich forests with *Picea abies*, 9070 Fennoscandian wooded pastures, and 91T0 Central European lichen Scots pine forests. The inventory of the areas and quality of these habitat types as well as other habitats is taking place since 2016. Therefore, new sites for these three habitats along with others included in the infringement case 2019/2304 may be proposed based on the results of the inventory (tentatively planned in 2021).
As indicated in the Chapter C.1 above, all Latvian Natura 2000 sites are legally approved, including their borders. Preventive and conservation measures are for each Natura 2000 sites are outlined in the general or individual regulation of the conservation and management. Therefore, all Latvian Natura 2000 sites are partially fulfilling the conditions for SAC.

As for conservation objectives, only few sites in their management plant have quantified conservation objectives. Favourable reference values (FRVs) for species and habitats on the national level are not set either. In 2019, the University of Latvia supported by the MEPRD developed guidelines for the setting FRVs (at the national level) and site-specific conservation objectives for species and habitats. Guidelines provide detailed algorithm for setting national and site-specific conservation objectives taking into account legal requirements stemming from the EU Nature directives, ecological information, as well as historical data on presence of the species/habitat in Latvia. Algorithm proposed by the study is robust, scientifically grounded and relatively easy applicable. Therefore, current PAF proposes to set national and site-specific conservation objectives.

The *Law on Specially Protected Nature Territories* provides for the development of site management plans for the protected nature territories. The content of the management plan and procedure for development

of the plan are outlined in the regulation approved by the government. Regulation does not distinguish the protected areas neither by size, nor complexity, the same procedure applies to all territories. The procedure is rather lengthy, however, involving a lot of opportunities for consultation with stakeholders, official public hearings, etc. Therefore, the speed of the development of the management plans is rather low. Management plans have been developed for 33% of all Natura 2000 sites in Latvia. In 2014–2020, development of 25 new plans is in progress; however, still the speed of plan development is insufficient. Therefore, the procedure for developing the site management plans should be revised to allow speed up process yet not compromising the public participation aspects of the procedure.

In addition, in period 2014–2019 the individual regulations for management and protection for particular protected nature territories have been developed or revised for 20 Natura 2000 sites.

Several targeted inventories were conducted to revise list of protected nature monuments and to improve their protection.

In 2014–2015, a special field inventory was conducted to prepare proposals to revise borders of the existing nationally protected geological and geomorphological monuments and to establish new protected territories for highly valuable geological and geomorphological monuments. Almost all the geological and geomorphological monuments under protection are Natura 2000 sites or located within Natura 2000 sites. According to scientific proposals in January 2017 the first amendments in legislation came into force, revising borders of 47 sites and adopting establishment of two new nature monuments protected by the national legislation. In the end of 2019, changes in legislation came into force revising borders of 69 geological and geomorphological monuments and establishing five new nature monuments.

		Number of sites with:		
Sites of Community Importance (SCIs) under the EU Habitats Directive	**Number of sites**	**legal site designation (SAC or equivalent)**	**specific site level conservation objectives**	**specific site-level conservation measures**
Total	235	235	0	60

		Number of sites with:		
Special Protection Areas (SPAs) under the EU Birds Directive	**Number of sites**	**legal site designation (SAC or equivalent)**	**specific site level conservation objectives**	**specific site-level conservation measures**
Total	4	4	0	1

		Number of sites with:		
Sites of Community Importance (SCIs) under the EU Habitats Directive and Special Protection Areas (SPAs) under the EU Birds Directive (Natura 2000 sites for both Directives)	**Number of sites**	**legal site designation (SAC or equivalent)**	**specific site level conservation objectives**	**specific site-level conservation measures**
Total	94	94	0	59

Further measures needed

In order to ensure appropriate legal protection of species and habitats in situ, the following activities should be taken:

- **Analysis of EU habitat mapping results** and general recommendations to revise Natura 2000 network as well as setting the FRVs at the national level for species and habitats of the EU importance;
- **Revision of nationally protected legally binding species and habitat lists** considering the latest data of monitoring and knowledge based on scientific studies, and favourable references values for EU habitats and species of EU importance;
- Improvement of Natura 2000 network, ensuring better biodiversity conservation and management inside Natura 2000 network:
  - **revision of borders of existing Natura 2000 sides and establishment of new sites**, as appropriate (e.g. according to scientific based proposals, for most vulnerable places with EU habitats and species, currently outside Natura 2000 network);
  - **changes in legislation** to ensure necessary specific requirements for protection and management actions in protected areas, including assessment and proposals for legal provisions ensuring the improvement of the conservation status.

During development of Natura 2000 site management plans and accordingly to several specific research data between 2014 and 2019, the proposals to revise borders of several Natura 2000 sites, including enlargement of sites, and proposals for new territory specific rules for site protection and management, including revision of existing functional zones of conservation areas, has been prepared. For several sites, the legislative acts have been revised. In the period 2020–2027, would be necessary to revise legislation for the rest of Natura 2000 sites where evaluation has been done and the proposals prepared. Species and habitats included in the infringement case 2019/2304 will also be covered.

- Research on marine habitats in potential high value marine areas must be done to prepare proposals and ensure **designation of new marine protected areas in offshore areas**. For marine protected areas management plan must be developed, considering need to control invasive alien species and to improve connectivity between marine protected areas.
- **Development of recommendations for green and blue infrastructure** and necessary **management and protection activities to ensure connectivity between Natura 2000 sites**. Recommendations may include site-based measures (e.g. microreserves, protected belts, voluntary commitments of the private landowners, etc.) or management prescriptions. The aim of this action is to ensure coverage of an appropriate protection status for species and habitats with dispersed distribution patterns, especially in cases when non-interference regime is required.
  - **Setting site-specific conservation objectives (species, habitats) for all Natura 2000 sites.**
  - **Revision of national legislation to set clear protected area categories** that are in coherence with Natura 2000 sites designation objectives and IUCN categories.
  - **Revision of existing legislation system and requirements for development of Natura 2000 site management plans** is critical. The new approach must ensure that management plans are integrated in territorial planning, management activities are legally binding, and mechanisms are developed to support private landowners to implement necessary management activities. Management plans should incorporate the ecosystem service approach for setting conservation objectives to the extent possible and feasible. The criteria must be set to differentiate Natura 2000 sites where there is a need for active conservation measures therefore a detailed management plan is feasible from Natura 2000 sites where the main goal is to ensure undisturbed natural processes. The procedure of the development of the management plan should be adjusted accordingly.
  - **Development of further Natura 2000 site management plans** for Natura 2000 sites with variable natural values and socio-economic interests, setting concrete management and conservation objectives. As a priority, individual management plans for 30 Natura 2000 sites must be developed.
  - **Development of simple, standardized management plans** for all Natura 2000 sites where natural processes is a priority. There are 170 Natura 2000 sites non-interference regime (mainly strict protection to avoid human made disturbance) is necessary.

Prioritization of measures to be implemented during the next MFF period

All the measures listed in the previous point are important for the achievement of objectives as they are setting preconditions for the successful management planning and implementation of the management plans. They are all placed in the priorities for the period 2021–2027. Many of the listed priority measures are included in the LIFE Nature IP, as submitted by the NCA. Grant agreement was signed in 2020.

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

The table includes indication which activities are included in the scope of the LIFE Nature IP. Majority of the measures are studies or development of the draft legal proposals and following procedures for adoption. Therefore, costs are related the salary costs of the employees of the Ministry and NCA or outsourcing of the studies.

No.	Name and short description of the measures	Type of measure*	Estimated cost in euros (annualised)	Possible EU co-funding source
1	Analysis of EU habitat mapping results and general recommendations to revise Natura 2000 network (except marine areas)	One-off	214,290	LIFE IP
2	Revision of habitat and species reference lists for Habitats and Birds Directives	Recurring	100,000	LIFE, national funds
3	Setting favourable references values for EU habitats and species of EU importance at state level	One-off	357,150	LIFE, LIFE IP
4	Revision of nationally protected legally binding species and habitat lists	Recurring	60,000	LIFE
5	Revision of borders of exiting terrestrial Natura 2000 sides and establishment of new sites – preparations of proposals	One-off	357,150	LIFE IP
6	Development of recommendations for green and blue infrastructure	One-off	214,290	LIFE, LIFE IP, other funds
7	Necessary protection activities to ensure connectivity between Natura 2000 sites (establishment of "stepping stones")	One-off	357,150	
8	Setting favourable references values for EU habitats and species of EU importance for all Natura 2000 sites	One-off	285,720	LIFE IP, national funds
9	Revision of existing legislation system and requirements for development of Natura 2000 management plans	One-off	35,720	LIFE IP
10	Development of Natura 2000 management plans and species and habitats management plans	Recurring	2,800,000	
11	Changes in legislation (e.g., establishment of new Natura 2000 sites, including marine protected areas, revision of borders, changes in rules of site management and protection, new regulation for development of Natura 2000 management plans)	Recurring	300,000	State budget, LIFE IP

* Indicates whether the measure is recurring or one-off.

Expected result

The measures outlined above will lead to fulfilment of the requirements of the EU Nature directives (e.g. setting the conservation objectives, improving the management planning) as well as will facilitate more streamlined implementation of the national legislation. The revision and improvement of the Natura 2000 network will give legal certainty both for nature authorities and socio-economic development. The improvement in legislation will allow to be more effective in Natura 2000 network management and to finish Natura 2000 network designation. This will allow in next period to focus more on integrated management and development of Natura 2000 network integrity and connectivity.

Procedure of the development of the management plan will be appropriate to the size, complexity of the Natura 2000 territory and will allow better balancing the nature conservation and socio-economic interests.

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

The governance of the Natura 2000 network consists of several steps and institutions:

1. Ministry of Environmental Protection and Regional Development (MEPRD) develops the environmental policy, ensures international cooperation on the policy level. In relation to Natura 2000 sites and EU nature legislation, MEPRD develops proposals for site border setting and adjustment, approves the sites and species management plans, based on management plans develops the draft individual regulations for protection and management, develops the system for the compensation of the restriction of the economic activity or certain management provisions.

2. Nature Conservation Agency (NCA) is the implementing body for the nature policy mentioned above. In particular, NCA organizes and supervises the development of site and species management plans, initiates and supports the implementation of these plans, develops and implements biodiversity monitoring, prepares the reports, as required by the EU nature directives, issues permits on use and/or protection of the species and habitats, controls the compliance with the nature legislation, etc. NCA consists of central office and 4 regional administrations. NCA is the main institution dealing with stakeholders in the Natura 2000 management.

During the period 2014–2019, site management plans for 36 Natura 2000 sites have been developed or updated, as well as nine species and one habitat management plan have been developed where management activities are foreseen for Natura 2000 sites. Simultaneously, proposals for legislation have been prepared. Currently 18 management plans for Natura 2000 sites and six species management plans are under development. Three multi- species management plans have been developed for species groups: seals, owls, and woodpeckers. For woodpeckers and owls, specific research and modelling to indicate the most vulnerable sites for species conservation have been conducted. These results will be the basis for taking into the account while developing proposals to improve Natura 2000 network for these umbrella species.

In 2017, the LIFE project "National Conservation and Management Programme for Natura 2000 Sites in Latvia" has been finalized. During this project, guidelines for the EU habitat management have been developed, as well as a framework for Natura 2000 site management till 2030 has been prepared. The project results are used for species and habitat management, the synergy with landowners and stakeholders has been developed to improve grassland and freshwater habitat management.

Continuous administration of procedures, e.g. implementation of legislative acts, administration of management planning, expertise, management and restoration, surveillance, monitoring, maintenance of data bases, control, public involvement, designation of new sites (specially protected territories, microreserves) is necessary to ensure an appropriate protection regime for Natura 2000 network, ecosystem functions, habitats and species.

The management of the 333 designated Natura 2000 sites is currently based on the following elements:

1. Legal protection;

2. Surveillance and monitoring;

3. The compensation system for the certain restrictions of the economic activity;

4. Maintenance of data bases (includes monitoring and other nature data, management plans, data about restrictions, information exchange for compensation payments and EAFRD payments, etc.);

5. The restoration and management actions for habitats and habitats of species;

6. The integration of nature issues into territorial planning, impact assessment, etc. by preparing data, experts advise, proposals for improvement of legislation;

7. Development of Natura 2000 site management plans, species and habitats management plans and their implementation.

The implementation of the Natura 2000 network requires application of conservation measures that have the major objective to preserve the natural environments and native wildlife species. However, this approach often imposes management constraints on farmers and forest landowners. Currently through Rural Development Programme farmers have no right to destroy permanent grasslands that have been designated as ecologically sensitive permanent grasslands, whether within or outside Natura 2000 sites. This approach helps to protect semi-natural grassland habitats but is not accepted by all farmers. Agricultural and forestry allowances, as well as subsidies for the maintenance of grassland habitats and habitats of species of Community interest are supported mainly by the European co-financing via the Rural Development Programme 2014–2020. National budget is available to compensate losses caused by migratory and non-game species, but during the recent years the amount of funding for compensations has increased. The investments to prevent losses caused by migratory and no-game species must be used more to avoid disproportionate compensation.

Between 2013 and 2019, nature management plans for 32 Natura 2000 sites have been developed and revised, nine species and one habitat management plan were developed. Since 2016, the EU Cohesion Fund supported "Nature Census" project that allows developing 20 Natura 2000 site management plans and five species management plans. The "Nature Census" project is the largest effort of the recent years when large number of the management plans are being developed at the same time. This project revealed several important issues regarding the management planning and communication with the stakeholders. These issues are related to the lack of the general knowledge of the nature legislation and requirements, a lot of misunderstandings and sometimes even manipulation with the information and public opinion, etc. The communication with landowners and stakeholders is critical to develop management plans, therefore much larger effort is needed for educational and informative actions.

NCA implements the Biodiversity Monitoring Programme, which includes several subprogrammes (see https://www.daba.gov.lv/public/lat/dati1/vides_monitoringa_programma/). The implementation of the different subprogrammes is subcontracted to scientific institutions and NGOs. Certain parts of the monitoring are done also by the employees of NCA.

All the monitoring data, as well as data from the site and species management plans and different research projects and programmes are stored in the Nature Data Base "Ozols" which records all nature data, and through this system data exchange between other sectors occur. The data is used for compensation and payment calculation, for management planning, surveillance and monitoring, etc. Data is also used within environmental impact assessment and permitting process carried out by other state and municipal institutions. Therefore, it is of paramount importance that data base is up-to-date content and system-wise.

With the advent of smart phones and web technology, a new set of possibilities must be explored to involve people in citizen science, for example, monitoring, counting of nature monuments noble trees, etc.

The management in Natura 2000 sites for species and habitats restoration and regular management has been mainly done by NCA and JSC "Latvia's State Forests". JSC "Latvia's State Forests" manages most of state-owned forests, except for those in the strict nature reserves and national parks, and those managed by

NGOs, private landowners, municipalities. NCA collects the information about the current management and organises events for stakeholders to inform about necessary management activities.

For the "Nature Census" project funded by the Cohesion Fund, a stakeholder panel is established to ensure that all interest groups and sectors (representatives of farmers, foresters, peat extractors, environmental NGOs, municipalities, etc.) are involved from the beginning in the process of the EU importance habitat mapping and are informed about the process and results. Although this panel is a single project related, it has proved to be useful platform for exchange of the information, awareness building and conciliation of different interests.

Provisions for the conservation of the natural values (species, habitats) are included also in the sectoral legislation, such as legislation for territorial development and land use planning, protected belts, nature conservation requirements for forestry, hunting and fishing regulation, surface water quality regulation, legislation for land taxes, etc. Some of these provisions are specific to the protected areas, including Natura 2000 sites, some contribute to the broader biodiversity conservation.

Public participation in the planning of the management activities has a crucial role in a successful implementation of conservation activities, especially in the case of Latvia, where ca. 62 % of protected nature areas occur on private and/or municipal lands. Thus, intensive efforts have been made to raise awareness of landowners and managers concerning ecosystem services provided by EU importance habitats and biodiversity in general, appropriate measures for land management, possibilities for financial support, best practices, etc. There have been numerous seminars, informative meetings, and press conferences to share experiences of good examples in nature management, particularly for semi-natural habitats, freshwater habitats, and invasive alien species. Sporadic volunteer activity for nature management has been created and supported along with public involvement and awareness raising through regular communication, interpretation, education, and training for different target groups. However, these volunteer activities are recently initiated and have never been applied or used systematically to ensure management necessary for the improvement of the conservation status of the species and/or habitats.

The management guidelines for EU importance habitats have been developed and widely used. A variety of informative materials and recommendations are developed by LIFE and national funded projects: all these materials are available both in printed and electronical version and used by municipalities, private landowners, experts, etc.

Notwithstanding the previous activities and achievements in the management planning and stakeholder involvement, the existing **capacity for Natura 2000 network management, surveillance and monitoring must be seriously improved**, reconsidering the current legal framework, procedures, data management as well as supplementing human capacity of the involved public institutions. In addition to the existing institutional setting, more capacity should be devoted to the private landowner consultation on the appropriate management of the land for facilitating the achievement of the improvement of the conservation status. Also, the existing system of the economic instruments for biodiversity conservation should be reconsidered and new approaches should be developed stipulating positive involvement of the private landowners in the implementation of the nature conservation measures.

Further measures needed

Majority of the measures planned for 2021–2027 are foreseen to ensure better management of the Natura 2000 sites. The table below indicates which measures are already included in the LIFE-Nature IP application. Further measures, if needed, will be based on the results of the LIFE-Nature IP.

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

Table includes indication which activities are included in the scope of the LIFE-Nature IP. Majority of the measures are studies or support payments planned by the Rural Development Programme. Therefore, costs constitute the salaries of the employees of the MEPRD and NCA or outsourcing of the inventories and research. Support payments and conditions for receiving them will be developed at the later stage by the national competent authority based on provisions of the relevant EU legal acts. MEPRD is involved and will be consulted during this process.

No.	Name and short description of the measures	Type of measure*	Estimated cost in Euros (annualised)	Possible EU co-funding source
1	Development and promoting of voluntary approach favouring active site management measures for semi-natural habitats	Recurring	300,000	LIFE, LIFE IP, state budget
2	Revision of compensation mechanism	One-off	85,720	LIFE IP, state budget
3	Compensatory allowances	Recurring	2,000,000	EARFRD, EMFF, state budget
4	Investment in administrative capacity (for state institutions)	Recurring	300,000	LIFE IP, state budget
5	Tax exemption	Recurring	2,500,000	
6	Investment to prevent losses caused by migratory and non-game species	Recurring	100,000	EARFRD, EMFF, state budget
7	Legal and financial control payment measures	Recurring	10,000	EMFF, EAFRD, state budget
8	Regular panel for stakeholders	Recurring	3,000	State budget
9	Seminars, meetings, communication, and awareness rising campaigns, special surveys of the landowners' opinion	Recurring	500,000	
10	Development of national electronic visitor monitoring system	One-off	285,720	
11	Development of new digital applications and interactive public monitoring system tools	One-off	500,000	LIFE, LIFE IP, ERDF/CF
12	Specific measures on invasive alien species (stakeholder involvement, implementation of IAS regulation, improvement of national legislation, development of early warning system, etc.)	One-off	285,720	LIFE IP
13	Measures related to the habitats and species action plans (communication, stakeholder involvement)	Recurring	20,000	
14	Measures related to the management plans of Natura 2000 sites (communication, stakeholder involvement)	Recurring	75,000	State budget
15	Measures in new RDP (Adjusting the Rural Development Programme's agri-environmental schemes for better management of semi-natural habitats and related species of EU importance)	Recurring	120,000	EAFRD
16	Other measures in order to protect and promote the management of habitats and species (small grants, investment projects)	Recurring	120,000	LIFE IP, state budget
17	Regular consultation board for landowners (available regular specialist advise for landowners about specific management activities)	Recurring	75,000	

* indicate whether the measure is recurring or one-off

Expected results

The combination of the improved existing measures and the implementation of new measures should allow better management of the Natura 2000 sites as well as the habitats and species outside the network.

Two complementary approaches (legal and voluntary) will be combined to reduce the tension between socio-economic and nature conservation issues and to improve the conservation status for species and habitats. Investment tools to prevent losses caused by migratory and non-game species will be developed and accepted by farmers. These measures, although costly in short term, would facilitate the long-term benefit and acceptance from the private landowners.

Communication actions, stakeholder and expert panels and platforms will be essential to create common understanding of nature conservation needs. The expected results are increased public participation in conservation-aimed activities, increased understanding and knowledge, and contribution through appropriate land management, volunteering, etc.

The use of modern applications and technologies in public engagement, including public monitoring activities, will promote knowledge of natural values and reduce public negative attitudes. Visitor monitoring and the operation of nature education centres contribute to the promotion of the Natura 2000 network and its socio-economic benefits.

Adjusting the Rural Development Programme's agri-environmental schemes for better management of semi-natural habitats and related species of EU importance will help to improve habitat quality. Increased knowledge on biodiversity among advisers and training on biodiversity issues through agri-environmental schemes will promote appropriate management of EU importance habitats and species.

E.1.3. Monitoring and reporting

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

The monitoring and reporting are the responsibility of the NCA. The national biodiversity monitoring programme covers both species and habitats inside and outside Natura 2000 network. Large amount of data about EU habitats since 2017 has been collected through the CF "Nature Census" project.

From 2014 until 2019, approximately € 2,318,000 has been invested in research and monitoring and monitoring equipment targeting the following groups of organisms:

Amphibians and reptiles: 89,500 €

Mammals (except bats): 173,665 €

Bats: 140,100 €

Birds (including Common Bird Index, Forest Bird Index, wintering bird monitoring in sea, Natura 2000 site specific monitoring): 931,285 €

Plants: 70,000 €

Fish: 175,850 €

Invertebrates: 394,340 €

Invasive alien species: 20,000 €

Equipment for monitoring (GPS, ultrasonic detectors, invertebrate traps, etc.): 160,000 €

Digitalization of historical data: 25,000 €

Habitats: 94,000 €

Seminars for biodiversity experts, expert calibration: 32,000 €

Other expenses (specific map digitalisation, methodologies development, etc): 12,260 €

Additionally, certain proportion of monitoring data are being collected by the NCA employees, and expenses are covered by the NCA budget. Monitoring of invasive alien species distribution has been partly implemented by integrating the needs in other subprogrammes, while for some species (mainly plants) new tools must be developed.

NCA cooperates with the JSC "Latvia's State Forests", scientific institutions and NGOs, thus part of information necessary for reporting is collected from other research projects and supplements the data from monitoring.

Projects supported by the Latvian Environmental Protection Fund (state budget programme earmarked for supporting different national environmental projects) for scientific institutions and NGOs had helped to collect information about species of the EU importance and their distribution thus improving data quality and availability for reporting.

The habitat monitoring methodology has been revised and nationally used for EU habitat mapping, habitat quality assessment methodology and tool for Nature Data Base "Ozols" has been developed and improvement continues. The "Nature Census" project will provide the baseline for the information on the habitat distribution and quality; however, this project involves large human capacity in the field work and data analysis. In order to make future monitoring activities more cost-efficient and to make the best use of all available data, monitoring methodology should be updated, and better use of the remote sensing opportunities should be investigated.

In addition to the "Nature Census" project, NCA has secured more funding from the Cohesion Fund for improvement of the migratory birds and bat monitoring system and equipment.

Improvement of the national biodiversity monitoring programme (methods) has been started (developing DNA markers, developing monitoring of management performance), continuing previously on-going monitoring sub-programmes; development and approbation of innovative methods in species monitoring.

The Nature Data Base "Ozols" has been upgraded to create new tools for monitoring as well as to sort data and to digitalise historical data for some species groups.

Further measures needed

The national biodiversity monitoring programme should be improved according to the insufficiencies discovered within the second monitoring period (2013–2020). Implementation of the national biodiversity monitoring programme is crucial in ensuring regular updating of knowledge on the conservation status of protected species and habitats within Natura 2000 network, background data (population sizes, cover, tendencies) on protected species populations and habitat areas throughout the country, and the role of both natural and anthropogenic pressures on species and habitats (trends).

For some species groups which are not covered by the existing monitoring or there is still data insufficiency, it is necessary to **develop methodologies for monitoring subprogrammes and to start their implementation** (e.g. invasive alien species, specific groups of birds). Several monitoring subprogrammes starts to use DNA sampling or there are recommendations to develop this aspect. It is necessary to evaluate different methods from the point of view of cost-effectiveness and to develop methodologies. **The use of remote sensing methods** in identifying changes in habitat cover, landscape patterns, environmental impacts (e.g. drainage, fires, etc.) must be developed to ensure habitat monitoring in future.

It is necessary to **integrate freshwater habitat monitoring with water quality monitoring** carried out under the Water Framework Directive **and the monitoring of invasive alien plant species in waterbodies** for more effective use of resources and integration of different sectors. It can be done either by developing an integrated new methodology for waterbodies monitoring or by at least a joint procurement for the subcontractors. The better option still must be explored. It is important to establish **monitoring, management, and supervision system for invasive alien species**.

Monitoring in marine areas is expensive and resources consuming and currently there has been collected basic data: there is a need to **develop methodologies to evaluate marine habitat quality**.

Improvement is needed to monitor sea birds' and mammals' by-catch.

Methodologies to evaluate habitat and species habitat restoration and management must be developed and implemented at state level.

Voluntary monitoring and public involvement must be developed. The use of modern **applications and technologies** in public engagement, including public monitoring activities, promotes knowledge of natural values, but there must be available regular resources for organising, educating, and promoting voluntary monitoring.

New indicators to evaluate impact from anthropogenic pressure (land use, managing practice in agriculture and forestry) must be developed and tested. Specific biodiversity and environmental indicators at state level should be developed for agricultural and forestry sectors, and territorial planning, to ensure that biodiversity and ecosystem services factor has been considered in other sectors. For example, in 2019 monitoring to evaluate situation in grasslands valuable for bird species has started. The specific monitoring for pollinators and landscape pattern evaluation should be developed.

Climate change impacts on ecosystems, habitats and species is hard to evaluate and indicators and methodologies must be developed and tested.

Additional resources will be needed to maintain the level of follow-up of known groups and to improve the knowledge on groups of organisms that are less known. The administrative resources are needed to maintain and develop the Nature Data Base "Ozols" where all monitoring data are stored, and to improve the capacity of experts and coordination of monitoring.

Prioritization of measures to be implemented during the next MFF period

All the measures may be considered as priorities for the period 2021–2027. Improvements in the monitoring methodology will lead to more cost-efficient methods and approaches for data gathering. The data gathered will help to assess the impact of the conservation measures planned and implemented as well as they will help in finetuning the sectoral policy and legislation.

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

No.	Name and short description of the measures	Type of measure*	Estimated cost in Euros (annualised)	Possible EU co-funding source
1	Maintenance and strengthening of expert staff (external assistance):			
1.1	strengthening expertise targeted at new species groups or improving knowledge and assessment of the conservation status of species' habitats for taxa already monitored	Recurring	50,000	
1.2	development and implementation of new indicators and monitoring methodologies (pollinators, landscape, DNA, remote sensing data methods)	Recurring	200,000	
1.3	development of marine habitats monitoring and regular biodiversity monitoring (except regular marine areas monitoring covered by E 2.1.)	Recurring	550,000	
1.4	sea birds and mammals by-catch monitoring	Recurring	5,000	
1.5	development and implementation of methodologies to evaluate habitat and species habitat restoration and management	Recurring	75,000	
1.6	capacity building seminars for experts involved in monitoring	Recurring	20,000	
2	Strengthening of administrative capacity:			
2.1	Nature Data Base "Ozols" maintenance and enhancement, to implement new tools for voluntary monitoring and sorting data (additionally to E.1.2. – licences and system maintenance)	Recurring	200,000	LIFE IP, state budget,
2.2	improvement of Nature Data Base "Ozols", developing new tools for more effective reporting and data analysis	One-off	500,000	LIFE IP, ERDF/CF, state budget,

2.3	capacity building for monitoring system supervision and organising subprogramme implementation	Recurring	50 000	LIFE, state budget
2.4	Development and implementation of indicators for climate change impacts on ecosystems, habitats and species	One-off	114 290	LIFE
2.5	Establishment of monitoring, management and supervision system for invasive alien species	Recurring	70 000	LIFE IP, state budget, EMFF

* indicate whether the measure is recurring or one-off

Expected results

The strengthening of monitoring methodologies should allow a more detailed and more objective follow-up of the indicators of the state of conservation. The quantitative and qualitative improvement of the data will make it possible to optimize management actions (management support tools). The good governance and data storage give support for long term monitoring that allows to evaluate changes of biodiversity in long term and helps to develop best solutions to stop decrease of biodiversity. Increased knowledge on species distributions, ecology, role of different impacts including restoration and management approaches is covered by the national monitoring programme and additional research projects.

Establishment of monitoring, management and supervision system for invasive alien species will help to implement the invasive alien species regulation.

E.1.4. Remaining knowledge gaps and research needs

Current status

Since 2016, the "Nature Census" project funded by the EU Cohesion Fund is being implemented, within which most Natura 2000 management plans and species management plans are being developed within the period 2016–2019. During this project, a country wide mapping of habitats of EU importance started. The EU habitat inventory results will be used to propose the revisions of the Natura 2000 network ensuring the efficiency and coherence to ensure protection of EU habitats. Additional research of *Najas flexilis* and *Osmoderma barnabita* has been conducted to obtain data and to prepare proposals for new Natura 2000 site designation or enlargement of the existing Natura 2000 sites. Information from species management plans, specific species studies together with EU habitat inventory results will be used as a basis for major changes improving the Natura 2000 network within the coming years.

In 2016, all protected tree alleys and some potentially highly valuable tree alleys were inventoried, and in 2017 a proposal was prepared to revise the list of protected tree alleys. During the inventory of alleys important sites for protected invertebrate species were identified, as well as areas where management activities are necessary were listed. Some of surveyed tree alleys are located within Natura 2000 sites, and new data help to organise the management and to ensure the protection of these natural values. At the end of 2019, four new tree alley protected sites were established and three existing protected alleys were enlarged by adopting the respective legal acts. All these sites are important for *Osmoderma barnabita* and will be proposed to designate them as Natura 2000 sites.

In 2017 and 2018, special inventory for invertebrates and other natural values were conducted in the protected dendrological plantings. The results point out the necessary management activities, as well as results are used to prepare proposals for legislation ammendments regarding the existing borders and protection regime of the dendrological plantings. As some of the nationally protected dendrological plantings are important sites for *Osmoderma barnabita*, currently there is ongoing work to prepare proposals and to designate these territories as Natura 2000 sites.

Despite the resources allocated to the monitoring and specific research projects in the period 2014–2019, several "unknown" assessments of the conservation status in the latest Habitats Directive's Article 17 report remain. The latest report under Article 17 indicates that the proportion of habitats that have been assessed as "unknown" has increased to 7%. This is mainly due to new data, mapping of three new EU habitat types that were previously not recognised as present in Latvia (habitat types 9050, 9070, 91T0), and increased knowledge of habitat distribution and quality. As for all habitat types the FRVs must be set accordingly to methodology developed by the University of Latvia, still some additional research on the quality indicators

is necessary for several forest habitat types (9010*, 9020, 9050, 91T0), semi-natural grassland habitat types (6530*), marine and coastal habitats (1170, 2180, 2190).

Article 17 report also indicates that the proportion of species for which the conservation status has been assessed as "unknown" has decreased to 9%. This is mainly due to new specific research projects or improved knowledge of species ecology. Moreover, regular monitoring has improved data availability. However, there are still knowledge gaps in all groups of the species, therefore further research should be promoted, for instance, on the species distribution, ecology, threats and pressures, dispersal availability for several species or species groups of EU importance – dragonflies, bats, invertebrates, plants (*Cladina sp., Lycopodium sp., Sphagnum sp.*), etc. Significant deficiency in knowledge is identified on saproxylic forest species (Coleoptera, fungi, mosses). Better knowledge of these groups would make it possible to refine the understanding of forest dynamics and thus to improve the assessment of the conservation status of forest habitats. There is lack of qualitative data about widely distributed species, therefore solutions to overcome this shortage in the cost-efficient way should be sought (e.g. by involving citizen science). For several species research must be conducted to improve methodologies to evaluate species population size level, for example, *Osmoderma barnabita*. For some species, state-level inventory should be conducted to gather information about the population structure, migration possibilities and environmental conditions (for example, *Margaritifera margaritifera*), without scientific information it is not possible to plan reintroduction actions where they may be necessary. Some specific studies are necessary for mosses, lichens, invertebrates, molluscs, and birds. For common mammal species there is lack of distribution data.

Research of priority importance includes preparation of scientifically grounded justification for the need to protect certain species, habitats, ecosystems (e.g. designation of new conservation areas, changes in national legislation, etc.), proposals for best management approaches tested along with long-term monitoring, evaluation of the impact of the management/restoration measures on the conservation status of the habitat types and species, assessment of potential impacts and their role on the restorability of species populations, habitats, ecosystems, etc. Part of E.1.4. measures are connected to E.1.1., E.1.2. and E.1.3. measures, and they complement each other: the research needs should be prioritized in time frame according to the needs of revision of legislation and monitoring.

EU habitat mapping and LIFE project results of testing the ecosystem service approach should serve as a base for mapping the ecosystem services at the country level. The increased need to use renewable energy sources can have an unfavourable impact on migratory bird species and bats when the wind farms are not properly located or assessed, therefore assessment on the impact of wind farms on migratory bat and bird species on their migration routes (both in terrestrial and marine areas) is important.

The research on invasive alien species impact, pathways, the best methods of control must be conducted to supplement the monitoring data.

There are some specific knowledge gaps regarding the SPAs: triggering bird species that would be necessary to address via additional research. For several vulnerable or declining species, the knowledge gap is related to the use of habitat in relationship to the breeding success or reasons for short-term population decline should be analysed. This is particularly the case for species like *Botaurus stellaris, Ciconia ciconia, Circus aeruginosus, Clanga pomarina, Crex crex, Lanius collurio, Emberiza hortulana, Saxicola rubetra.* **Specific studies to evaluate the importance of the different microbiotopes on agricultural and forest lands** for the conservation of the bird species populations should be carried out, as well as studies to explain short term and long-term population decrease of bird species connected with forests and agriculture lands.

Species management plans are developed by gathering basic information and doing specific research, but this approach should be changed. The specific research should be conducted before management plan development, thus allowing more discussions about management not questioning the quality or credibility of the data, as it has happened several times in past.

Ensuring a wise administration of Natura 2000 network and other conservation areas is possible only with adequate institutional capacity, from planning to implementation, monitoring and regular site surveillance and control. Building capacity of scientific institutions and experts is of high importance in ensuring good

quality research and ensuring scientifically sound argumentation. Currently there is lack of knowledgeable experts, and involvement of new specialists is needed.

Further measures needed

Priority topics:

- Development of the necessary scientific background documents for completion of the Natura 2000 network. That includes analysis of the data and results of the EU habitat mapping carried out in the "Nature Census" project, development of the proposals for the improvement of the Natura 2000 network, and the necessary conservation and management measures to facilitate the improvement or maintenance of the conservation status

- Evaluation of the impact of conservation measures, socio-economic factors and climate change on the conservation status of the natural and semi-natural habitats of the Habitats Directive's Annex I and the species in Annex II and IV;

- Patterns of the species and habitat distribution should be studied, and studies on the importance of the connectivity of habitats and species of EU importance within the scope of conservation planning should be promoted. Research must focus on species habitats, EU habitats and landscape elements to develop green and blue infrastructure and adaptation to climate change;

- Long-term studies on succession (habitat dynamics) under different management approaches should be promoted;

- Climate change impacts on ecosystems, habitats and species should be assessed and corresponding conservation measures should be proposed and implemented;

- A comparative study between the assessments of the conservation status of habitats and aquatic species according to two EU directives (Habitats Directive and Water Framework Directive) to streamline the field monitoring methods to use them in cost-efficient way;

- The study on the impact of invasive alien species on ecosystems, habitats, native species, and the best restriction methods for invasive alien species not included in the species list of EU concern;

- Upscaling of the results of finalized projects on ecosystem services and values with an aim to gradually implement a country-wide assessment of the ecosystem services and their value;

- Revision of the latest knowledge on species distribution and conservation status for all organism groups (revision of national Red Data Book) and use of data to ensure the appropriate legal status of species;

- Specific studies on species ecology, threats and pressures; distribution for those species and habitats of EU importance where assessment of conservation status is unknown;

- Assessment of the impact of wind farms on migratory bat and bird species on their migration routes (both in terrestrial and marine areas), creating national tool to evaluate the most appropriate places with the lowest impact on bird and bat species where the wind farms could be developed.

- Capacity building of scientific institutions and experts.

Prioritization of measures to be implemented during the next MFF period

All measures are important and should be implemented in PAF 2021–2027

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

NA

No.	Name and short description of the measures	Type of measure*	Estimated cost in Euros (annualised)	Possible EU co-funding source
1	Scientific studies and proposals for designation of new Natura 2000 (other than covered in E.1.1. (focus on terrestrial habitats) and E.2.1. (focus on marine habitats)	One-off	714,290	
2	Evaluation of the impact of conservation measures, socio-economic factors, and climate change on the conservation status of the natural habitat types of Annex I and the species in Annex II and IV (focus on species and habitats with unfavourable conservation status)	One-off	100,000	
3	Research on spatial patterns and connectivity of habitats and species of EU importance	One-off	107,150	
4	Research of marine habitats and important marine sites for bird feeding, breeding and migration and fish spawning	One-off	500,000	LIFE
5	Long-term studies on succession (habitat dynamics) under different management approaches (additional to E.1.3. measures)	Recurring	15,000	
6	Climate change impacts on ecosystems, habitats, and species (additional to E.1.3. measures)	Recurring	35,000	
7	Comparative study between the assessments of the conservation status of habitats and aquatic species according to the 2 Directives (Habitats and Water Framework);	One-off	7,150	
8	The research on invasive alien species impact on ecosystems, habitats, species, pathways analysis and best restriction methods;	One-off	60,000	LIFE IP
9	Identification and estimation of ecosystem services and values	One-off	571,430	
10	Revision of the latest knowledge on species rarity and conservation status for all organism groups (revision of national Red Data Book) and use of data to ensure legal conservation status of species;	One-off	500 000	LIFE
11	Specific studies of species ecology, threats and pressures, distribution for those species and habitats of EU importance where assessment of conservation status is unknown;	Recurring	350,000	
12	Assessment of the impact of wind farms on migratory bat and bird species on their migration routes (both in terrestrial and marine areas), creating national tool to evaluate most appropriate places with lowest impact on bird and bat species where to develop wind farms	One-off	214,290	LIFE
13	Building of capacity of scientific institutions and experts	Recurring	280,000	

* indicate whether the measure is recurring or one-off

Expected results

A good cooperation between scientific institutions and state institutions established by implementing joint research projects. Scientific institutions carry out practical research in the field of nature protection and increase their capacity by attracting new experts. Research data are also used in preparation of scientific publications.

Regular training and raising the capacity of conservation officers and inspectors is ensured, so that the most recent scientific data are used in decision making process. An increasing number of highly qualified species and habitat experts, better coverage of knowledge in certain fields (especially for some taxonomic groups, e.g. invertebrates, mammals, mosses, lichens, fungi), and increased participation of highly qualified expert opinions in the decision making process.

The changes in legislation (protected areas, use of wild species) are based on scientific approach. The research data are accepted and used for impact assessment and spatial planning.

The funding for research is allocated to the priority topics, and for the next Article 17 reporting the percentage of "unknown" assessments for the conservation status of species and habitats of the EU importance decreases.

The research projects serve as a basis for practical conservation measures and are used in planning of the species and habitat management and conservation activities both inside and outside the Natura 2000 network.

The ecosystem services maps at the country level are available.

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

Current status

Larger Natura 2000 areas with well-developed visitor infrastructure (walking, hiking trails, guided tours, etc.), mainly national parks and nature parks, promote economic development of the particular region. To estimate the economic impacts of the Natura 2000 sites output data is needed. Establishment of a visitor monitoring system (purchase and deployment of visitor counters, visitor surveys, data collection, acquisition of date base, education of staff and experience exchange) and implementation of a methodology to measure the economic effectiveness of Natura 2000 visits are very important. To measure the wellbeing of the local community regular surveys concerning tourism development should be implemented. These measures are included in E.1.2. section.

In protected area symbiosis may occur if tourism and conservation are organized in mutually beneficial way allowing both to derive benefits from the relationship, gain experience and understanding about the nature by having the opportunity to see, touch, and listen to the nature in the appropriate time, place, and manner, and to understand the rules of behaviour. The good example of communication platform for different stakeholders where to develop ideas and cooperation for activities in Natura 2000 sites is Ķemeri National Park (European Charter for Sustainable Tourism) and Gauja National Park (https://www.entergauja.com/lv/) where entrepreneurs, municipalities and biodiversity specialists work together to ensure sustainable tourism in Natura 2000 sides. The similar initiatives are developing in other largest Natura 2000 sites, for example, the public event "Day for Travelers" in Slītere National Park and Rāzna National Park, when NCA organises special programmes together with local entrepreneurs, municipalities, and tourism operators for visitors.

The economic potential of sustainable tourism remains largely unrealised in Latvia. The tourism infrastructure in Natura 2000 sites has been developed, including information stands and boards. Health routes have been established within Natura 2000 sites, thus contributing to the popularisation the Natura 2000 network as an investment in health improvement. Investment is done mainly by the Cohesion Fund and LIFE projects, as well as by the JSC "Latvia's State Forests".

Many protected sites do not charge admission fees for use of the tourism infrastructure, which could provide financial benefits, but on the same time local entrepreneurs develop new products to attract tourists for longer stay, so the role of Natura 2000 sites increases. There are still many opportunities to develop an optimal model on how to maintain and manage the visitor infrastructure in Natura 2000 sites, for example, to implement private-public partnership, introducing fees for tourism operators in the Natura 2000 sites, etc. These and other options should be analysed in the overall assessment of the biodiversity economic instruments in Latvia.

The current communication around Natura 2000 is focusing on broad scale: landowners and managers active in Natura 2000 areas, local communities, municipalities, NGOs, schools, hunters, forestry companies, etc.

A general communication campaign is ongoing to inform about the EU habitat mapping process. Each landowner whose land is surveyed within the scope of the project activities receives a personalized information about EU habitat mapping, development of Natura 2000 site management plan or research projects in the particular site. The NCA is organizing general awareness rising campaigns at state level, as well as public events in Natura 2000 sites.

When legislation changes occur in Natura 2000 site, each landowner in written is informed and additional informal meeting is organised. More about informative campaigns and activities described in section E.1.2. and measures defined there.

NCA has regional units – nature education centres with some specialists planning and organising different communication activities. There is a need to increase the capacity for nature educational centres, as currently the demand exceeds the capacity of the staff. Other organisations such as Latvian National Museum of Natural History, National Botanic Garden and Botanical Garden of the University of Latvia, Riga National Zoo are also developing as educational centres and here additional expositions about the biodiversity and Natura 2000 issues can be developed.

Further measures needed

Communication around Natura 2000 should be organized at several levels (additionally to E.1.2. measures):

1. Communication at the regional level to the general public – general awareness rising is necessary towards the general public on the Natura 2000 network, the Natura 2000 network should be perceived by the public as a part of the solution to the general biodiversity erosion and climate changes.

2. Communication between project developers and NCA should be promoted in order to clarify legal constrains and possibilities when planning the economic activity within a Natura 2000 site, or likely having the impact on Natura 2000 sites, EU species or habitat.

3. Communication at the municipality level – every municipality, inhabitants should be aware on the existence of the local Natura 2000 sites and consider legislation regarding Natura 2000 sites.

4. Communication at the Natura 2000 site level: informative boards and signs must be in every Natura 2000 site where visitor infrastructure exists.

5. Natura 2000 Day: NCA should organize a yearly event in order to improve general awareness of Natura 2000.

6. Communication towards nature-oriented sport organisations, forest companies, agricultural companies etc. in order to highlight Natura 2000 role.

The new nature education centre should be developed, or capacity of existing educational points should be increased to ensure need for educational activities both for landowners and school system. This includes new interactive expositions in existing educational centres, for example, Riga Zoo, botanical gardens, Natural History Museum about Natura 2000 network, invasive alien species, rare and endangered species and other biodiversity issues.

To ensure sustainable tourism, the visitor's infrastructure should be developed in Natura 2000 sites based on the management plan.

Prioritization of measures to be implemented during the next MFF period

NA

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

No.	Name and short description of the measures	Type of measure*	Estimated cost in Euros (annualised)	Possible EU co-funding source
1	General awareness rising at regional level, communication campaign	Recurring	30,000	
2	Municipality level large audience communication	Recurring	20,000	
3	Communication at the Natura 2000 site level: visitor access and information, including new tourism infrastructure	One-off	2,571,430	ERDF/CF
4	Natura 2000 Day	Recurring	5,000	State budget, national funds
5	Communication with stakeholders in Natura 2000 sites	Recurring	20,000	State budget, national funds, LIFE, LIFE IP
6	Development of national nature educational centres (e.g. new expositions) or improvement of existing	One-off	4,285,720	ERDF/CF

* indicate whether the measure is recurring or one-off

Expected results

Better awareness by the general public on Natura 2000 and legal requirements stemming from the nature legislation. Identification by the public of the Natura 2000 network as a potential recreative trip destination, increasing socioeconomic benefits of Natura 2000 network. Natura 2000 status is considered in real estate projects and territorial planning, solutions can be found to balance nature conservation and business interests.

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

Article 17 report: https://www.eea.europa.eu/themes/biodiversity/state-of-nature-in-the-eu/article-17-national-summary-dashboards/conservation-status-and-trends Article 12 report: https://www.eea.europa.eu/themes/biodiversity/state-of-nature-in-the-eu/article-12-national-summary-dashboards Operational conclusions of the Bilateral Meeting between the European Commission and the Latvian Authorities in the context of the Action Plan for Nature, People and the Economy, 2019. National Conservation and Management Programme for the Natura 2000 sites in Latvia, 2018–2030. OECD Environmental Performance Review, Latvia: https://www.oecd.org/environment/country-reviews/OECD-EPR-Latvia-2019-Abridged-Version.pdf

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

Annex I marine and marine inlet habitats covered in this section – 1110, 1150*, 1170

There are 2 marine habitat types occurring in territory of Latvia:

- 1110 Sandbanks which are slightly covered by sea water all the time (SR for EEZ)

- 1170 Reefs (SR for EEZ)

Latvian coast of the Baltic Sea belongs to the most exposed shores of the Baltic Sea, hosting one habitat of the EU importance – Stony reefs (1170).

Stony reefs (1170) are one of the most prominent, ecologically significant habitat types in the Eastern part of the Baltic Sea, and considered as a biodiversity hotspot for attracting invertebrates, fish, birds and plants. It is important to note that stony reefs in the south-eastern Baltic Sea differ greatly from the reef habitats found in the north. Stony reefs in the south-eastern Baltic exist on the verge of environmental limits, making them even more vulnerable to environmental disturbance, but their existence still more precious for the ecosystem functioning. Regarding sandbanks habitats (1110) there is lack of information. Both habitats host several different algae, mollusc, and fish species, as well as are important sites for birds.

The coastal lagoons (1150*) areas make mosaic with other coastal habitats, mainly coastal grasslands. Within the "Nature Census" project, all areas where this habitat type is likely to occur are investigated and more accurate data available, which show that part of the previously known old lagoons has been transforming by overgrowing, but at the same time there are coastal lines where new lagoons are forming. There is a small, but biologically extremely rich coastal lagoon (1150*) located on the eastern coast of the Gulf of Riga serving both as a stopover for birds during their migration and distribution routes for migrating fishes before ascending coastal rivers for spawning.

Current status of habitats

The most important known localities of marine habitats and seabird habitats in the coastal areas are protected under the Natura 2000 network. However, the offshore areas are still to be investigated and necessary protection and conservation measures should be developed.

The total area of reefs (1170) within Latvia marine area is estimated about 984,5 km^2, while sandbanks (1110) cover 53,3 km^2. Approximately 66% of reef and 29% of sandbank area are covered by coastal marine protected areas (Natura 2000 sites). During the development of the Latvian Marine Spatial development plan based on the data on sea bottom structure several areas are identified for the further research in order to establish the correspondence of these areas to the habitats listed in the Habitats directive. Therefore, further research projects may be initiated.

In the most recent report on the conservation of habitats and species under the Habitats Directive (Article 17 report), the assessment of conservation status of sandbanks (1110) was evaluated as unknown. Mainly it is because of lack of data, but partly there is need to define national quality criteria for evaluation of both protected marine habitats and to review existing definitions and descriptions of both habitats. Sandbanks have never been particularly distinguished and never specially investigated, as still there are gaps in knowledge about the reefs.

The same report indicates that the conservation status of stony reefs (1170) is U2 (unfavourable-bad), due to unfavourable-bad assessment of structures and functions of the habitat. The available research data show that the range and area of reefs are in favourable condition, although the distribution of the habitat is determined only by the presence of a suitable substrate, i.e. stones. While performing additional reef habitat mapping, new reef areas may be discovered, but their functional status is currently unstable. Typical species

composition has not changed; however, the changes of their proportions has been observed, mainly due to predation effects of invasive species round goby *Neogobius melanostomus* on the mussels *Mytilus trossulus*. The increase of the invasive species population has led to a significant decline of the *Mytilus trossulus* stands, but the macrophytic algae have an unstable increase. Meanwhile, in the Gulf of Riga, the mussel stands have decreased, but the macrophyte groves are losing depth, pushing closer to the shore due to reduced water clarity and increasing number and intensity of storms.

Designation of new marine protected areas in Latvian EEZ in areas hosting priority habitat reefs and/or sandbanks, and invasive species control plan and its implementation will improve the conservation status of these habitats.

The total area of coastal lagoons (1150*) in Latvia is about 690 ha, approximately 26% (180 ha) are located within Natura 2000 sites. According to latest Article 17 report, the conservation status of the coastal lagoons was assessed as U2 (unfavourable-bad) mainly due to the assessment of the structures and functions of habitat and future perspectives: the old lagoons overgrow, mainly because of coastal processes, but still there is need to improve the water exchange, to control the reed expansion and reduce eutrophication.

For both habitat types there is not enough information to define long-term trends in general. Favourable reference values and national, and site-level conservation objectives for these habitat types are not defined according to the developed national methodology.

Conservation measures taken until now and their impact so far, remaining pressures and threats

The MEPRD has developed, and the Cabinet of Ministers has approved national planning document "Marine Planning for Inland Sea Waters of the Republic of Latvia, Territorial Sea and waters of the exclusive economic zones" (Marine Planning 2030). This document describes existing and planned use of sea waters till 2030. Although the document does not directly address marine protected areas, Natura 2000 sites, however, given the interconnected nature of the marine environment, many of the measures included in the Marine Planning 2030 will have a direct impact on the management and integrity of marine protected areas.

The ecosystem services approach was used to set priorities and measures in Marine Planning 2030. Healthy marine environment and stable ecosystem as well as national security are the key priorities for marine areas. Priority areas of the economy include maritime development and safe shipping, sustainable fisheries and tourism, and the use of RES at sea. In order to promote the long-term vision and strategic priorities, in Marine Planning 2030 three strategic objectives have been set, and one of them is as follows: "the marine ecosystem has been preserved and its ability to regenerate through biodiversity has been preserved by protection and avoidance of excessive burdens on business". The Marine Planning 2030 defines five biological study areas – zones, pending the exploration, where use of sea that could potentially endanger protected underwater habitats and species is not permitted (including WES, wave energy power plant, hydrocarbon exploration and production, hydrocarbon production platforms, aquaculture fields). These areas are defined as potentially protected marine areas for habitats and species (i.e. birds). There are several measures, responsibilities and deadlines set in the Marine Planning 2030, but main measures regarding habitat and species protection and Natura 2000 network includes:

1. To update the information on ecologically important areas and the distribution of habitats and species and their status based on recent research and monitoring data. The result is a report about the distribution and protection of habitats and species, defined potential marine protected areas.

2. To analyse and evaluate the importance of fish spawning areas and the spatial distribution of places where the juvenile fish live. The result – a report on fish spawning and spatial information about fish spawning sites and important sites for the fish juveniles.

3. To prepare spatial solutions (events) for erosion reduction, including indicating places at sea where sand extraction on the beach could be acceptable, as well as places to be beech feeding without creating threat to the marine ecosystem. The result – spatial solutions (events) developed for mitigation coastal erosion in sections with the highest erosion risk.

4. To monitor and evaluate seal populations on a regular basis, to prepare the species management plan. The result – species management plan developed.

To implement the Marine Planning 2030, the NCA and other institutions had started to cooperate more closely both in data sharing and preparing joint projects.

The Latvian Institute of Aquatic Ecology implements marine environmental monitoring and biodiversity monitoring programmes in accordance with the Environmental Monitoring Guidelines and Monitoring Programme. They focus on water quality and benthic habitats, invasive marine species, part of the monitoring stations are located within the Natura 2000 network of protected marine areas. The Institute of Food Safety, Animal Health and Environment "BIOR" implements monitoring for fish species, provides scientific advises regarding catch limitation, gear use, etc. The NCA implements biodiversity monitoring programmes in accordance with the Environmental Monitoring Guidelines and Monitoring Programme. The NCA organises monitoring of wintering birds and develop the seal management plan. Not all monitoring and research needs are fully covered, but in comparison to the previous period enough data had been collected for decision makers, as the data amount allows scientists to prepare scientific justified proposals.

The Institute of Food Safety, Animal Health and Environment "BIOR" has implemented actions to reduce population of invasive species round goby *Neogobius melanostomus*. The scientists develop gears and, together with fishermen, implement new methods to reduce this species. The Ministry of Agriculture has changed legislation to promote catch of round goby and to develop products of this species to make it more attractive for fishermen. However, there are still need for new measures and studies on ways how to reduce the population of round goby more efficiently and to minimise its impact on protected marine habitats.

The LIFE Cohabit project (LIFE15 NAT/LV/000900) aimed at restoration of habitats, including coastal lagoons in Natura 2000 site "Piejūra" (LV0301700) has been recently implemented. For other Natura 2000 site "Randu pļavas" (LV0509100), a plan for restoration of the coastal meadows and lagoons has been developed, though not implemented yet considering the costs and possibilities to attract funding. The current restoration actions have not covered most coastal lagoons that must be restored, and more efforts are needed for practical restoration.

A national action plan for rescuing animals at sea and ashore after sea pollution is currently revised, setting a scheme for responsible authorities and mechanism for animal rescue.

For marine habitats main pressures and treats are differing between the Gulf of Riga and open Baltic Sea waters. In the Gulf of Riga, the main pressures and threats are eutrophication and climate change, while in the open Baltic sea the major threats are eutrophication and invasive species round goby *Neogobius melanostomus*. Overall, the pressures and threats are not just national, but all of them can be affected outside Latvia. The highest pressures and treats are agricultural activities generating marine pollution, marine fish and shellfish harvesting (professional, recreational) causing reduction of species/prey populations and disturbance of species, invasive species. Other important pressures and threats are increases or changes in precipitation due to climate change, forestry activities generating pollution to surface or ground waters, shipping lanes and ferry lanes transport operations, military exercises and operations in the marine environment, etc.

Global warming directly influences the climate in Baltic region, causing mild and wet winters. Increased winter precipitation induces soil erosion and surface runoff from terrestrial ecosystems, in turn increasing accumulation of humid substances in the lakes and rivers and finally reaching the Baltic Sea. The phenomenon is referred to as browning of coastal waters, causing decreased light penetration, decreased macrophyte growth depth and depletion of coastal habitats. This problem can be solved just by complex approach reducing human impact on all ecosystems.

For coastal lagoons, the most important pressures and threats are natural succession resulting in species composition change (other than by direct changes of agricultural or forestry practices), natural processes of eutrophication or acidification, modification of coastline, estuary and coastal conditions for development, storms; a medium scale pressure and threat is drainage.

Birds

In the Latvian marine waters, the population trends since 2014 have been analysed for 19 wintering bird species and groups of bird species. Since 2014, there have been statistically significant changes for three bird species and four species groups: for three species groups and three species of them a population increase was found, thus showing that the number of most wintering bird species is stable or increasing[12]. As the regular monitoring started from 2014, it should be continued with additional research for bird species to follow the population trends.

Measures needed to maintain or restore favourable conservation status

The main activities to reduce threats and pressures on marine habitats are:

1. Improvement of status of marine habitats (quality, structure and function) through the development and implementation of an action plan for controlling invasive marine species and development of mitigation measures to reduce seabird and marine mammal bycatch in coastal fisheries.

2. Development of the quality criteria for evaluation of the protected marine habitats and review of the existing definitions and interpretation of habitats;

3. Improvement of the monitoring methodology for assessment of qualitative and quantitative changes as well as influencing factors of benthic habitats, fish and birds;

4. Identification of potential offshore marine protected sites, possible designation of new Natura 2000 sites;

5. Assessment of the effectiveness of the marine Natura 2000 network (including potential new protected areas) within the Latvian marine waters;

6. Lowering the impact of the terrestrial activities on the marine environment – measures in the Rural Development Programme and agricultural and forestry policies;

7. Improving response capacity for animal rescue work;
8. Development and implementation of the management plan for all Natura 2000 marine areas;

9. Assessment of ecosystem services provided by protected benthic habitats (1170 and 1110) on coastal and offshore areas;

10. Ensuring regular biodiversity monitoring in Natura 2000 marine areas;

11. Restoration of coastal lagoons 1150* (mainly in Natura 2000 site "Randu pļavas").

Prioritization of measures to be implemented during the next MFF period

All the above listed measures are priority measures as they are related to the legal responsibilities stemming from the EU nature directives. Insufficient designation of the marine Natura 2000 sites is also mentioned in the formal notice in the infringement case 2019/2304.

Measures mentioned in the PAF will be used not only for allocation of the EU funding, but also domestically in preparation of the projects or requesting additional funding from national sources. The PAF will be used as the justifying document, therefore all mentioned measures are indicated as priority ones.

Costs marked as one-off are already covered by the LIFE programme funding, therefore for more detailed calculation – see the project application for the project LIFE19 NAT/LV/000973.

[12] Monitoring of wintering birds in the sea (https://www.daba.gov.lv/upload/File/DOC_MON/MON_ATSK_19_aviouzskaites.pdf)

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

No.	Name and short description of the measures	Type of measure*	Target (unit & quantity)	Estimated cost in Euros (annualised)	Possible EU co-funding source
1.1	Improvement of status of marine habitats (quality, structure and function) through the development and implementation of an action plan for limiting invasive marine species and development of mitigation measures to reduce seabird and marine mammal bycatch in coastal fisheries.	One-off		35,720	LIFE
1.2	Development of the quality criteria for evaluation of the protected marine habitats and review of existing definitions and interpretation of habitats	One-off		14,720	LIFE
1.3	Identification of potential marine protected sites, possible designation new Natura 2000 sites.	One-off		252,860	LIFE
1.4	Assessment of the effectiveness of the marine Natura 2000 network (including potential new protected areas) within the Latvian marine waters	One-off		20,000	LIFE
1.5	Development of management plan for all Natura 2000 marine areas	One-off		19,290	LIFE
1.6	Restoration of coastal lagoons (mainly in Natura 2000 site "Randu pļavas")	One-off	120 ha	285,720	ERDF/CF
1.7	Ensuring regular biodiversity monitoring in Natura 2000 marine areas (habitats, birds) (not covered in the section E.1.3.)	Recurring		150,000	State budget

Additional measures beyond Natura 2000 (wider green infrastructure measures)

No.	Name and short description of the measures	Type of measure*	Target (unit & quantity)	Estimated cost in Euros (annualised)	Possible EU co-funding source
2.1	Improvement of the monitoring methodology for assessment of qualitative and quantitative changes as well as influencing factors of benthic habitats, fish, and birds	One-off		14,290	LIFE
2.2	Lowering the impact of the terrestrial activities on the marine environment – measures in the Rural Development Programme and policies of agriculture and forestry (eco-schemes, obligations for farmers	Recurring		18,000,000	EAFRD

	and foresters to apply for subsidies)				
2.3	Implementing marine pollution response capacity for animal rescue work and facilities – amount of expenses in case of accident	One-off		20,430	State budget
2.4	Assessment of ecosystem services provided by protected benthic habitats (1170 and 1110)	One-off		14,290	
2.5	Monitoring of eutrophication in marine	Recurring		120,000	State budget

* indicate whether the measure is recurring or one-off

Expected results for targeted species and habitat types

1. Indicators for the evaluation of the quality and species diversity of benthic habitats developed, descriptions of two marine EU protected habitats – stony reefs (1170) and sandbanks (1110) updated facilitating easier identification of these habitats in the Eastern Baltic Sea area.

2. Monitoring methodology for assessment of qualitative and quantitative changes in the benthic habitats improved.

3. Information on the extent and conservation state of protected benthic habitats, fish and bird communities in the Latvian EEZ improved, and network of marine Natura 2000 sites completed.

4. Reliable estimation on the effectiveness of the network of Natura 2000 sites and increased understanding of the ecological integrity of habitats and species.

5. Management plans for all Natura 2000 marine sites developed.

6. Impact from invasive marine species decreased and environmentally friendly fishery practices developed and implemented.

7. At least in 120 ha of coastal lagoons (1150*) restored to improve the habitat structures and functions and to improve their conservation status.

Expected results: other benefits

The good status of marine habitats ensures good status of fish stocks, bird populations and good water quality. The quantity and quality of ecosystem services improve. The pressure of eutrophication does not increase. Contribution to the achievement of the objectives of the Marine Framework Directive.

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

Annex I heathlands and scrubs habitats covered in this section

All the heathlands and shrubs habitat types listed in Annex I of the Habitats Directive occurring in Latvia are depending on an extensive management through agricultural or other practises (e.g. grazing or mowing). These are:

- Decalcified fixed dunes with *Empetrum nigrum* (2140*);
- Dunes with *Salix repens ssp. argentea (Salicion arenariae)* (2170);
- Dry sand heaths with *Calluna* and *Empetrum nigrum* (2320);
- Northern Atlantic wet heaths with *Erica tetralix* (4010);
- European dry heaths (4030);

• *Juniperus communis* formations on heaths or calcareous grasslands (5130).

Current status of habitats

The most important known localities are protected under the Natura 2000 network, but there are several Natura 2000 areas for which borders might be revised to include in protection zone habitats bordering with the existing Natura 2000 sites.

The information about area of habitat types within Latvia, percentage of coverage in Natura 2000 sites, and assessment of the conservation status according to Article 17 report is summarized in the table below:

EU habitat	Range	Area	Specific structure and function	Future prospects	Overall assesment of conservation statuss	Overall trend in conservation statuss	Area covered by habitat (max area in ha)	Surface area of habitat type inside Natura 2000 network (ha/ %)
2140*	FV	U1	U1	U1	U1	S	127	44–63/35%
2170	FV	U1	XX	U1	U1	D	70	16–31 / 22%
2320	FV	U1	FV	FV	U1	I	2325	2324 /99%
4010	FV	U1	U1	U1	U1	I	1110	1064/ 95%
4030	U1	U1	XX	XX	U1	X	32	26/ 81%
5130	XX	U2	U2	U2	U2	D	68	42–45 (62%)

For all habitat types, except *Juniperus communis* formations on heaths or calcareous grasslands (5130) which the conservation status assessed as U2 (unfavourable/bad), the conservation status is U1 (unfavourable-inadequate).

The habitat type 5130 mainly occurs in mosaic with other grassland habitats, it is very rare and greatly depends on the management practice in other grasslands. ~5% of previously known habitat area have disappeared, mainly within Natura 2000 sites, due to inappropriate management and juniper forging due to natural reasons, therefore the trend is negative. There have been management activities to improve the habitat quality and to stop succession, but more focused actions are necessary.

Habitat types 2140, 2170 are located on coastal areas, they lack appropriate management. The area of habitats decreases due to their transformation into other habitat types or overgrowing. There is negative trend for the habitat type 2170.

Conservation status of habitats 2320 and 4010 improves thanks to habitat restoration measures that have been implemented, especially in Natura 2000 site "Ādaži" (LV0600800). To achieve favourable conservation status, habitat restoration and management activities should be implemented in Kurzeme region where the habitat 4010 hosts the only location for specific, nationally protected species *Erica tetralix*.

For habitat type 4030, new information during EU habitat mapping ("Nature Census" project) has been collected therefore the is possible to revise the existing assumptions for the management of this habitat type.

Favourable reference values and site-level conservation objectives for these habitat types are not yet defined according to the national methodology developed by the University of Latvia.

Conservation measures taken until now and their impact so far, remaining pressures and threats

Previous measures taken for these habitats include agri-environment schemes under the Rural Development Programme, as well as LIFE-Nature projects targeting the restoration of these habitats. The main restoration and habitat management activities occurred in Natura 2000 site "Ādaži" (LV0600800) where large areas of heath habitats have been restored.

The main pressures and threats are overgrowing, cessation of grassland management, lack of extensive grazing or undergrazing by livestock, conversion into forest from other land use types, natural succession resulting in species composition change, and natural processes of eutrophication or acidification.

Bird species

Long term trends for majority of bird species associated with these habitat types decreases.

Measures needed to maintain or restore favourable conservation status

Active management measures are required to ensure maintenance of existing habitat areas and improvement of structures and functions of the Annex I heathlands and scrubs.

1. **The habitat restoration** mainly in Natura 2000 areas is necessary for: 481 ha

• Decalcified fixed dunes with *Empetrum nigrum* (2140*) – restoration of 25 ha;

• Dunes with *Salix repens ssp. argentea (Salicion arenariae*) (2170) – restoration of 29 ha;

• Dry sand heaths with *Calluna* and *Empetrum nigrum* (2320) – 158 ha;

• Northern Atlantic wet heaths with *Erica tetralix* (4010) – 196 ha, in Kurzeme region;

• European dry heaths (4030) – 15 ha;

• *Juniperus communis* formations on heaths or calcareous grasslands (5130) – 58 ha (restoration and active management both in Natura 2000 sites and outside). Priority actions through Rural Development Programme and agri-environmental schemes for habitat type 5130 additionally explained in section E.2.4., as this habitat type occurs in mosaic with other grassland habitats.

Restoration activities include change of hydrological regime, tree cutting, milling, controlled burning, and others one-time renewal costs.

2. **Extensive or irregular management** of ~3200 ha habitats currently in good condition. It includes tree and scrub cutting, controlled burning, irregular mowing, etc.

This management will contribute to species conservation and habitat quality improvement.

Prioritization of measures to be implemented during the next MFF period

All the above listed measures are priority measures. Measures mentioned in the PAF will be used not only for allocation of the EU funding, but also domestically in preparation of projects or requesting additional funding from national sources. The PAF will be used as a justifying document, therefore all mentioned measures are indicated as priorities.

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

No.	Name and short description of the measures	Type of measure*	Target (unit & quantity)	Estimated cost in Euros (annualised)	Possible EU co-funding source
1.1	Habitat 2140*, 2170 restoration (1500 EUR/ha)	One-off	44 ha	9,430	ERDF/CF, national funds
1.2	Heaths (2320, 4010, 4030) restoration (2500 EUR/ha)	One-off	369 ha	131,790	ERDF/CF, LIFE, national funds
1.3	Restoring Juniperus habitats (5130) (2000 EUR/ha)	One-off	58 ha	16,570	EAFRD, ERDF/CF, LIFE, national funds
1.4	Maintaining habitats 2140*, 2170, 2320, 4010, 4030	Recurring	3,200 ha	320,000	EAFRD, national funds
1.5	Maintaining *Juniperus* habitats (5130) (300 EUR/ha)	Recurring	68 ha	20,400	EAFRD, national funds

Additional measures beyond Natura 2000 (wider green infrastructure measures)

No.	Name and short description of the measures	Type of measure*	Target (unit & quantity)	Estimated cost in Euros (annualised)	Possible EU co-funding source
2.1	Updating different level planning, including green infrastructure (implementation of species and habitat management plans)	Recurring		30,000	State budget
2.2	EU semi-natural habitat data exchange and transfer from NCA to Rural Support Service to facilitate application of the Rural Development Programe support payments for habitats inside and outside Natura 2000 network (salary for 1 specialist)	Recurring		22,000	EAFRD, LIFE IP

* indicate whether the measure is recurring or one-off

Expected results for targeted species and habitat types

The status of species typical to these habitats has improved (for example, *Dianthus arenarius* ssp*. arenarius, Pulsatilla patens, Erica tetralix*). The status for heath habitats is favourable. The habitat 5130 overall trend in conservation status stabilizes and some improvements in trend in habitat area and quality appears. The extent of the measures (area, costs) is included in the table above.

Expected results: other benefits

Improving the quantity and quality of ecosystem services. For most of the species (including birds and reptiles), also present in different habitat types (grasslands, peatlands, forests), those habitat measures would contribute to improvement of conservation status but must be combined with measures mentioned in other sections of this document.

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

Annex I bogs, mires, fens and other wetlands habitats covered in this section

All bogs, mires, fens and other wetlands habitats listed in Annex I of the Habitats Directive occurring in Latvia are depending on an extensive management and/or restoration. These are:

- Humid dune slacks (2190);
- Active raised bogs (7110*);
- Degraded raised bogs still capable of natural regeneration (7120);
- Transition mires and quaking bogs (7140);
- Depressions on peat substrates of the *Rhynchosporion* (7150);
- Fennoscandian mineral-rich springs and spring fens (7160);
- Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae* (7210*);
- Petrifying springs with tufa formation (*Cratoneurion*) (7220*);
- Alkaline fens (7230).

Current status of habitats

The percentage of habitat area inside Natura 2000 network must be considered as indicative as the EU habitat mapping continues till the end of 2020.

The information about area of habitat types within Latvia, percentage of coverage in Natura 2000 sites, and habitat assessment of conservation status according to the latest Article 17 report is summarized in the table below:

EU habitat	Range	Area	Specific structure and function	Future prospects	Overall assesment of conservation statuss	Overall trend in conservation statuss	Area covered by habitat (max area in ha)	Surface area of habitat type inside Natura 2000 network (ha/ %)
2190	FV	U1	U1	U1	U1	X	1,644	1,568–1,630/95%
7110*	FV	U1	U1	U1	U1	S	86,282–112,000	72,905/65%
7120	U1	U1	U2	U1	U2	X	11,780–15,314	6,795/44%
7140	FV	U1	U1	U1	U1	S	6,614–8,500	5,142/60%
7150	FV	U1	U1	U1	U1	S	630	630/100%
7160	FV	FV	XX	U1	U1	X	589–750	348/46%
7210*	FV	FV	XX	FV	FV	S	602–800	561/70%
7220*	FV	FV	U1	U1	U1	S	31–50	16/32%
7230	FV	FV	U2	U1	U2	X	2,196–2,300	2,073/90%

No data for trend assessment exists for several habitat types as historical data, for example, from Natura 2000 monitoring project (2008–2012), cannot be compared with country-wide habitat inventory results obtained during the last years.

The habitat 2190 is very variable and specific research must be conducted to determine the necessary management measures.

For majority of habitat types, conservation status assessed as U1 (unfavourable-inadequate) as overgrowing due to historical changes in hydrologic regime is the main problem. Historical sites of habitat 7120 has been developed to other priority habitats, 7110* and 91D0*, but 90% of habitat 7120 area needs large investment to restore the appropriate hydrological regime. For the habitat 7230, the conservation status is assessed as U2 (unfavourable-bad): this habitat is suitable for many rare plant and invertebrate species, but its quality declines due to lack of regular extensive mowing or grazing.

Favourable reference values at national level and site-level conservation objectives for these habitat types are not yet defined according to the national methodology developed by the University of Latvia.

Conservation measures taken until now and their impact so far, remaining pressures and threats

Conservation measures taken so far include restoring hydrological regime or removal of overgrowth to restore open landscape. The restoration of mire habitats has been supported from an Interreg project and from several LIFE projects.

There are also possibilities to use agri-environment schemes under the Rural Development Programme for some of these habitat types, but this possibility is rarely used by landowners.

The main threats and pressures in all country remain drainage of forest and agricultural lands (effects occur later in time), peat extraction that affects the hydrological regime of mire habitats, overgrowing (historically some habitat types used for mowing and grazing, in some places historical changes in hydrological regime have reduced the open mire areas), natural succession resulting in change of the species composition (other than by direct changes of agricultural or forestry practices), land reclamation and conversion of wetlands,

marshes, bogs into other land use types. Increase or changes in precipitation due to climate change in future might have impact on species communities. In some areas, invasive alien species, other than species of EU concern, have negative impact. In the Natura 2000 network, negative factors are influence of historical drainage.

Bird species

The status of birds in mire and wetland habitats can be considered moderately good. For some bird species population trends are stable or increasing (*Pluvialis apricaria, Grus grus, Aquila chrysaetos*); however, there are problems with several bird species which are common to wetland and open mire areas – there is long term population decrease for *Circus cyaneus, Gavia arctica, Tringa totanus*, etc.

Measures needed to maintain or restore favourable conservation status

Habitat restoration actions are required to ensure improvement of structures and functions of the Annex I bogs, mires, fens and other wetland habitats both inside and outside the Natura 2000 network.

Restoration actions in Natura 2000 network include mainly restoration of hydrological regime, tree and scrub cutting and others one-time renewal costs.

The habitat restoration in Natura 2000 areas is necessary for 8,400 ha.

• Active raised bogs (7110*) – there is a need to improve the habitat quality in ~4,000 ha. Taking into the account the existing conservation status of the habitat and assessment of the restoration costs, the priority is to restore very low-quality habitats or specific sites for species conservation (2,000 ha). More actions are needed for habitat 7120 to convert it into 7110* or 91D0*, i.e. to restore the wetland functions.

• Degraded raised bogs still capable of natural regeneration (7120) – there is ~1,200 ha of habitat that can be regenerate to habitat 7110* with less efforts, but 10,600 ha regeneration to 7110* habitat is related to very high restoration costs. Therefore, the PAF suggests restoring at least 6,000 ha of the habitat 7120 in Nature 2000 areas.

• Transition mires and quaking bogs (7140) – tree and scrub one-off cutting in 150 ha, followed by irregular mowing of shoots.

• Alkaline fens (7230) – there is a need to improve the habitat quality in 1,000 ha within Natura 2000 network. Some measures for the habitat type 7230 might be supported through Rural Development Programme and its agri-environmental schemes. Measures includes harvesting of plant biomass time by time, in some cases restoration of the hydrological regime might be necessary.

This management will contribute to species conservation and habitat quality improvement.

Prioritization of measures to be implemented during the next MFF period

All the above listed measures are priority measures. Measures mentioned in the PAF will be used not only for allocation of the EU funding, but also domestically in preparation of the projects or requesting additional funding from national sources. The PAF will be used as the justifying document, therefore all mentioned measures are indicated as priority ones.

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

No.	Name and short description of the measures	Type of measure*	Target (unit & quantity)	Estimated cost in Euros (annualised)	Possible EU co-funding source
1.1	Renaturalization and restoration of mire habitats (7110*, 7120)	One-off	8,000 ha	428,570	ERDF/CF, national funds
1.2	Open landscape management– one - off removal of trees and scrubs (7140, 7230)	One-off	1,150 ha	328,570	EAFRD, ERDF/CF
1.3	Extensive management of semi-natural mires, fens and other wetlands habitats	Recurring	1,000 ha	20,000	EAFRD

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

No.	Name and short description of the measures	Type of measure*	Target (unit & quantity)	Estimated cost in Euros (annualised)	Possible EU co-funding source
2.1	Updating different level planning, including green infrastructure (implementation of species and habitat management plans)	Recurring		30,000	
2.2	EU semi-natural habitat data exchange and transfer from NCA to Rural Support Service to facilitate application of the Rural Development Programme support payments for habitats inside and outside Natura 2000 network (expenses covered by E.2.2.)	Recurring		-	EAFRD

* indicate whether the measure is recurring or one-off

Expected results for targeted species and habitat types

The conservation status trends of different mire habitats are stable. The conservation status improving for *Saxifraga hirculus*. The conservation status improves for habitat type 7230. Part of bad quality mire habitats are managed and restored to improve their quality in future. The extent of the measures (habitats covered, area targeted and costs associated) is indicated in the table above.

Expected results: other benefits

The quantity and quality of ecosystem services improves, and measures helps to achieve the climate policy objectives.

Restoring mire and wetland habitats will contribute to climate change mitigation, helps to improve water quality in water bodies connected with mires and wetlands, reduces the risk of fire. The stable ecosystem helps to mitigate climate change and reduce risk of alien invasive species.

E.2.4. Grasslands

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

Annex I grassland habitats covered in this section

All grassland habitat types listed in Annex I of the Habitats Directive occurring in Latvia, are depending on an active management through agricultural management practises (grazing or mowing). These are:

- Boreal Baltic coastal meadows (1630*);
- Rupicolous calcareous or basophilic grasslands of the *Alysso-Sedion albi* (6110*);
- Xeric sand calcareous grasslands (6120*);
- Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (* important orchid sites) (6120);
- Species-rich Nardus grasslands, on siliceous substrates in mountain areas (and submountain areas, in Continental Europe) (6230*);

- Fennoscandian lowland species-rich dry to mesic grasslands (6270*);
- Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) (6410);
- Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels (6430);
- Northern boreal alluvial meadows (6450);
- Lowland hay meadows (*Alopecurus pratensis, Sanguisorba officinalis*) (6510);
- Fennoscandian wooded meadows (6530*);
- Fennoscandian wooded pastures (9070).

As habitat type *Juniperus communis formations on heaths or calcareous grasslands* (5130) can be found in mosaic with other grassland habitat types, information regarding semi-natural grassland management can also be relevant to this habitat.

Current status of habitats

All these 12 habitats are reported as being currently in an unfavourable conservation status (https://bd.eionet.europa.eu/article17/reports2018). In the Habitats Directive Article 17 report, the "Structures and functions" criterion for 10 habitat types has been assessed as being U2 (unfavourable-bad) , for one – U1 (unfavourable-inadequate), for one – XX (unknown), indicating that additional efforts will be required to optimize their agricultural management regime. According to EU habitat mapping results ("Nature Census" project) and information from the Rural Support Service, 30% of all grassland habitats in the country are abandoned and continue to overgrow. More than half of grassland habitats are in bad quality due to inappropriate management. The majority of the unmanaged grassland habitats are privately owned (59 %). Therefore, more effort is needed to involve private landowners to restore and manage grassland habitats.

Furthermore, for all grassland habitat types, the total area coverage is currently deemed insufficient or bad (based on the area criterion in the Article 17 report) – the main reason is grassland conversion into arable land or forest lands. The existing payment scheme has not promoted the management of coastal grasslands, juniper grasslands and even several open landscape habitats. In addition, more targeted management measures for certain bird species are necessary.

Favourable reference values and national, and site-level conservation objectives for these habitat types are not yet defined according to the national methodology developed by the Latvian university.

Conservation measures taken until now and their impact so far, remaining pressures and threats:

Previous conservation measures taken for these habitats include agri-environment measures under the national Rural Development Programme, as well as several LIFE-Nature projects targeting at the restoration of Annex I grassland habitats. Some nationally funded projects have been implemented for grassland restoration, but the impacted area is quite small. These measures have not been enough to stop the decline of grasslands within the Natura 2000 network, and additional measures will be needed to support grassland management in Natura 2000 network.

Within the "Nature Census" project, the historical grassland areas have been inventoried and new location of the grassland habitats mapped. In the beginning of 2020, the spatial information about seminatural grassland habitats was available for 91,005 ha. As EU habitat mapping continues in 2020, totally EU grassland habitats area might be up to 100,000 ha. During the "Nature Census" project, NCA cooperates with the Rural Support Service, and landowners and managers are informed by sending out individual letters about the possibilities to receive RDP support for the management of the semi-natural grassland habitats. Thanks to these efforts from 2015 to 2019, the number of applicants for payment for management of biologically valuable grasslands has increased by ~33% (4010 applicants in 2015, 5320 applicants in 2019). In 2019, agri-environment support measures were declared and supported in 39,624 ha of semi-natural grasslands. The target area of the RDP is 47,000 ha.

The payments from Rural Development Programme are available for the EU grassland habitats and vulnerable grasslands for bird species both in Natura 2000 network and outside. Nonetheless, there is still a large proportion of the EU grassland habitats that are unmanaged and in bad condition, because Rural Development Programme does not so far support restoration of the grassland habitats.

According to the national legislation, open protected habitat types that are registered in the Nature Database "Ozols" are not allowed to be afforested, so there is some mechanism to prohibit conversion into forest. But still part of grassland habitats is in so bad condition that without active restoration the grassland vegetation will disappear in the next years.
All grasslands corresponding to any of the EU grassland habitat types are considered as ecologically sensitive areas in accordance with the regulations of the Common Agriculture Policy (CAP). Therefore, there is mechanism in place which prevents ploughing up or afforestation of these areas. However, this might be considered as short-term solution depending on the CAP regulations, therefore more sustainable ways of the maintenance of the grassland habitats both inside and outside Natura 2000 sites must be sought.

Altogether, all **12 grassland habitats are found in 145 Natura 2000 sites**. **According to current preliminary data for the "Nature Census" project, on average 35% of grassland habitat areas occur within Natura 2000, 65% outside Natura 2000** (the percentage varies by habitat type), therefore it is critically important to foresee activities and support for grassland management not only in Natura 2000 sites, but in the entire territory of Latvia.

The main pressures and threats for all grassland habitats:
- Conversion into arable land;
- Abandonment of grassland management (e.g. cessation of grazing or mowing);
- Conversion to forest from other land uses, or afforestation;
- Reseeding of grasslands and other semi-natural habitats;
- Problematic native species (ruderal species), invasive alien species of Union concern and out of Union concern.

Bird species

In Latvia, several bird species (considered as trigger species for SPA designation) are related to grassland conservation, and the monitoring data show that there is long term population decline.
The Common Birds Index has been calculated since 1995 (there are 3 different versions of the index). Despite differences in the list of species used to calculate the indices, all versions of the indices fluctuate quite similarly, but differ in absolute values. Despite the rise in index values in 2018, all three indicators have witnessed a sharp decline over the past three years compared to the previous period. For two of the three indices (EFBI-2008 and LFBI-2013), the trends between 1995 and 2018 were assessed as stable, and the LFBI-2005 as moderate declines. At present, it is difficult to interpret the reasons for the decline in Common Bird Index in recent years, and there is a lack of specific studies analyzing the impact of various rural support measures on the populations of species forming bird indices.[13]
Monitoring data on farmland birds indicate that the existing farming practices affect different bird species associated with open landscape. One of the most abundant species is corncrake *Crex crex*, with a moderate increase in corncrake over the long term (1989–2018), but over the last 13 years (2006–2018) the corncrake population has declined moderately, especially over the last six years, when the bird population has declined. The decrease in the number of corncrakes can partly be explained by intensification of agriculture, conversion of permanent grasslands into arable lands or building up territories (especially around Riga), afforestation, etc. – reasons not specifically investigated[12,14].
Therefore, the corncrake is one of the species that should be a subject to special measures related to grassland management and restoration supported by the Programme. This can be implemented by specific management or conditions set for grassland management in the Programme (e.g. conservation of small untouched areas, buffer zones along rural edges, adjusting mowing time, etc.).
Several EU grassland habitats overlap with vulnerable grasslands for bird species, for example, floodplain grasslands, coastal grasslands. *Gallinago media* population status is critical due to low

[13] Monitoring report (https://www.daba.gov.lv/upload/File/DOC_MON/MON_ATSK_19_dienas_putni_gala_atskaite.pdf)
[14] Monitoring report (https://www.daba.gov.lv/upload/File/DOC_MON/MON_ATSK_19_naktsputnu_mon_atskaite.pdf)

quality of the species habitat. Thus, focusing investments for restoration of these grasslands and supporting regular management is critical both for the EU habitats and bird species.

Measures needed to maintain or restore favourable conservation status

1. Improving the support scheme for the management of semi-natural grasslands using more targeted tools in the Rural Development Programme:

- to increase the proportion of regularly managed semi-natural grassland habitats in the Natura 2000 sites important for grassland conservation – at least 20,000 ha of grasslands supported;

- to increase the proportion of regularly managed semi-natural grasslands outside the Natura 2000 network (green infrastructure) – at least 30,000 ha of grasslands supported;

- to increase the proportion of regularly managed semi-natural grassland habitats 1630, 6230*, 5130 and grasslands suitable for *Gallinago media* – 2,400 ha.

2. Restoration of semi-natural grasslands (existing EU grassland habitats with low quality and bird habitats) both inside and outside Natura 2000 sites – 5,000 ha.

3. Creation of new semi-natural grassland habitats (result-based management in potential EU grassland habitats) to ensure habitat connectivity and green infrastructure – 1,000 ha.

4. Development and testing of result-based payment schemes.

5. Making investments for the management of semi-natural grasslands (supporting actions that include establishment of pasture infrastructure, purchase of livestock and other investments necessary for the restoration and maintenance of grassland, purchase of technical equipment that reduces the loss of wildlife during mowing).

6. Developing green label schemes for products from semi-natural grasslands.

7. Making investments to use the grass cut from the semi-natural meadows.

9. Developing system for individual grassland management plans;

10. Improve legislation and implementation to prevent seminatural grassland conversion into arable or forest land.

Prioritization of measures to be implemented during the next MFF period

All the above listed measures are priority measures. Measures mentioned in the PAF will be used not only for allocation of the EU funding, but also domestically in preparation of the projects or requesting additional funding from national sources. The PAF will be used as the justifying document, therefore all mentioned measures are indicated as priorities.

The prioritisation of Natura 2000 sites that would require particular grassland management has been done indicating 41 Natura 2000 sites where at least one EU grassland habitat occupies more than 1% of the country's total habitat area. From those Natura 2000 sites at least 18 Natura 2000 areas are very important. 12,612 ha of EU grassland habitats and 1,081 ha of important grasslands for bird species are concentrated in 18 priority Natura 2000 sites, therefore grassland restoration and management actions into these Natura 2000 areas are of priority importance. These sites and habitats mentioned in table below:

EU habitat/ Natura 2000 site	1630*	6120*	6210	6230*	6270*	6410	6450	6510	6530*
Abavas senleja		X	X			X			X
Aiviekstes paliene							X		X
Augšdaugava		X	X		X				
Dvietes paliene		X	X		X		X	X	
Engures ezers	X			X		X			

Gaujas nacionālais parks		X						X	
Kuja				X	X	X	X	X	
Ķemeru nacionālais parks						X	X	X	
Liepājas ezers	X					X	X		
Lubāna mitrājs				X			X		X
Mugurves pļavas							X		X
Ogres ieleja						X			X
Rāznas nacionālais parks			X		X				
Sventājas upes ieleja				X					X
Svētes paliene							X	X	
Veclaicene					X			X	
Vestiena			X	X	X	X			
Ziemeļgauja			X		X		X	X	X

The Rural Development Programme should include measures to promote the protection and management of priority grassland habitats – those grasslands which are rare and overgrowing faster. A special focus must be on above mentioned Natura 2000 sites which are the most important for grassland conservation. The priority grassland habitats for restoration and management are Boreal Baltic coastal meadows (1630*), *Juniperus communis* formations on heaths or calcareous grasslands (5130), Species-rich *Nardus* grasslands on siliceous substrates in mountain areas (and submountain areas, in Continental Europe) (6230*).

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

No.	Name and short description of the measures	Type of measure*	Target (unit & quantity)	Estimated cost in Euros (annualised)	Possible EU co-funding source
1.1	To increase the percentage of regularly managed semi-natural grassland habitats in Natura 2000 sites important for grassland conservation – supported at least 20,000 ha of grasslands;	Recurring	20 000 ha	3 600 000	EAFRD
1.2	To increase percentage of regularly managed semi-natural grassland habitats 1630, 6230*, 5130 and grasslands suitable for *Gallinago media* – 2,400 ha.	Recurring	2 400 ha	480 000	EAFRD, LIFE
1.3	Development and testing of result-based payment schemes.	One-off	1000 ha	100 000	LIFE IP,
1.4	Restoration of semi-natural grasslands (existing EU grassland habitats with low quality and bird habitats) – (400 euro/ha)	One-off	5000 ha	285 720	EAFRD, ERDF/CF
1.5	Developing Green label schemes for products from semi-natural grasslands	One-off		71 430	LIFE IP
1.6	Developing system for individual grassland management plans	One-off		42 860	EAFRD
1.7	Making investments for the management of semi-natural grasslands (supporting activities include establishment of pasture infrastructure, purchase of livestock and other investments necessary for the restoration and maintenance of grassland, purchase of technical equipment that reduces the loss of wildlife during mowing).	Recurring		800 000	EAFRD

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

No.	Name and short description of the measures	Type of measure*	Target (unit & quantity)	Estimated cost in Euros (annualised)	Possible EU co-funding source
2.1	To increase percentage of regularly managed semi-natural grasslands outside Natura 2000 network (green infrastructure) – supported at least 30,000 ha of grasslands	Recurring	30,000	6,000,000	EAFRD
2.2	Creation of new habitats of semi-natural grasslands (result-based management in potential EU grassland habitats), to ensure habitat connectivity and green infrastructure – 1,000 ha.	Recurring	1,000	200,000	
2.3	Making investments to use the grass cut and removed from the meadows	Recurring		200,000	
2.4	Improve legislation and implementation to prevent seminatural grassland conversion into arable or forest land	Recurring		50,000	State budget

*indicate whether the measure is recurring or one-off

Expected results for targeted species and habitat types

The improvement and full implementation of the agri-environmental maintenance measures together with grassland restoration actions targeting all grassland habitat types (with additional focus to improve grassland management inside Natura 2000 network) will help ensuring that none of semi-natural grassland habitat types will suffer any further deterioration during the next period. Quantification of the expected results is outlined in the table on priority Natura 2000 sites as well as in the list of prioritized measures above.

In addition, a full implementation of the prioritized restoration and management measures targeting two grassland and one heath and scrub habitat type (1630*, 6230* 5130), is expected to lead to stability in the total area of their habitat, thereby leading to a measurable positive trend in the conservation status of these habitats by 2028.

For the bird species targeted, the full implementation of regular management measures and the restoration of wet pasture habitat is expected to contribute to a positive population trend to be achieved by 2028.

Expected results: other benefits

The above priority measures for grassland maintenance and restoration are expected to contribute to the ecosystem services and socio-economic benefits: wet pastures and floodplain meadows are buffers for climate adaptation, providing flood protection, and reduces pollution to water bodies. These habitats create landscape that provides a unique identity to the countryside and might attract visitors. Semi-natural grasslands are important for pollinators, honey producers have benefited from this ecosystem for centuries. Semi-natural grasslands as ecosystem assures production of various animal products. Wet grasslands offer sites for bird watching.

E.2.5. Other agroecosystems (including croplands)

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

There are no protected agroecosystem habitat types other than grasslands Latvia.

The increased use of plant protection products and the use of mineral fertilizers containing nitrogen and phosphorus indicates intensification of agriculture and increase pressure on environment, biodiversity, and species. The larger crop fields and their structure change landscape pattern but increase in arable land endanger conservation of semi-natural grasslands. At the same time the number of organic farmers is growing thus two different approaches of agriculture develops simultaneously and some conflicts between them arises.

There are diverse and regionally different agricultural landscapes in Latvia. Zemgale region in the central part of Latvia historically has been intensively used for arable land, and the rural landscape differs from other parts of Latvia. There are some regions with specific landscape patterns (tree alleys, groups of trees in arable land, specific relief, ancient dwellings, etc.), but the current intensification of agriculture slowly destroys this heritage.

Currently agri-environmental schemes supporting conservation of the existing landscape elements are available. The amount of biodiversity-enhancing landscape features is overall satisfactory in the Latvian agricultural landscape, but more support must be provided to ensure appropriate management of the existing landscape elements and creation of new landscape elements, as in the main agricultural areas their number is rather small, and the large arable land without adjacent landscape elements significantly reduces biodiversity and the coherence of the surrounding natural areas.

In Latvia, the pollinator species index is not being calculated, therefore there is no information about the agricultural impact on pollinators, but data of monitoring of farmland birds indicate that the current farming practices affect different bird species associated with open landscape. Both abandonment and intensification in the use of agricultural lands have caused changes in bird species related to agricultural lands, e.g. land abandonment from one side and intensive grassland management from other side has caused decline in populations of *Crex crex* and some other grassland-related species (*Gallinago media*, *Aquila pomarine*, *Philomachus pugnax* should be mentioned). The number and distribution of specific plant indicator species has changed indicating that there is too high pressure from agriculture to semi-natural habitats.

Support for environmentally friendly management exists. It sets requirements such as crop rotation, legume crops cultivation, winter vegetation, etc. An obligation to reduce the nutrient leaching by maintaining the protection zones has been implemented.

Measures needed to maintain or restore favourable conservation status

As there is no habitat of the EU importance related to other agroecosystems, measures listed below will serve the improvement of the environmental quality and biodiversity in general.

1. Implementing environment and biodiversity support schemes in agricultural land, including measures to improve the status of birds, amphibians, plants and pollinators (establishment of obligation to create buffer zone of water bodies, roads, between different cropland on agricultural land, etc.).

2. Voluntary actions through agri-environmental schemes to improve the status of biodiversity and to develop green infrastructure (diversification of agricultural landscape, zones between fields of the conventional and organic farming).

3. A restriction to transform wetlands and peatlands into arable land, restriction to transform biologically vulnerable grasslands in arable land.

4. A ban on support for new drainage systems in wetlands (including forest areas).

5. A ban on support for afforestation of grassland habitats of EU importance.

6. Development and implementation of environmentally friendly plant protection measures (including integrated plant protection) and support for organic farming.

7. Training agriculture advisors on environmental and biodiversity issues.

8. Greater support for small and medium-sized farms and creation of added value agricultural products.

9. Support to ensure appropriate management of existing landscape elements and creation of new landscape elements.

Prioritization of measures to be implemented during the next MFF period

All the above listed measures are priority measures. Measures mentioned in the PAF will be used not only for allocation of the EU funding, but also domestically in preparation of the projects or requesting additional funding from national sources. The PAF will be used as the justifying document, therefore all mentioned measures are indicated as priorities.

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

No.	Name and short description of the measures	Type of measure*	Target (unit & quantity)	Estimated cost in Euros (annualised)	Possible EU co-funding source
1.1	Implementing environment and biodiversity support schemes in agricultural land, including measures to improve the conservation status of birds, amphibians, plants and pollinators (establishment of obligation to create buffer zone along the water bodies, roads, between different cropland on agricultural land, etc.) – *measures included and overlap with measure in section E. 1.2.*	Recurring		-	EAFRD
1.2	Creating new buffer zones and managing landscape elements important for species and habitats of EU importance in Natura 2000 areas	One-off		428,570	EAFRD

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

No.	Name and short description of the measures	Type of measure *	Target (unit & quantity)	Estimated cost in Euros (annualised)	Possible EU co-funding source
2.1	Support business development with aim to use native wild plant seed material for management of buffer zones and restoration of permanent grasslands.	One-off		71,430	
2.2	Development and implementation of monitoring of Rural Development Programme's influence on biodiversity (development of biodiversity monitoring schemes and principles, development of new biodiversity indicators and monitoring methodologies (for example, pollinators, soil biodiversity, "edge effect" indicator to evaluate impact from agricultural land to seminatural-grasslands and vice versa etc.), implementation of the monitoring schemes) – *measures included and overlap with measure in section E.1.3*	Recurring			LIFE, LIFE IP, EAFRD, national fonds, other projects
2.3	Greater support for small and medium-size farms for the creation of added value goods	Recurring		40,800,000	EAFRD
2.4	Training agriculture advisors on environmental and biodiversity issues	Recurring		2,000	EAFRD, LIFE IP, LIFE, other projects
2.5	Development and implementation of environmentally friendly plant protection measures (incl. integrated plant protection) and support for organic farming	Recurring		1,800,000	EAFRD
2.6	A ban on support for new drainage systems in wetlands (including forest areas) and on support for afforestation of habitats of EU importance	Recurring		-	EAFRD
2.7	A restriction to transform wetlands and peatlands into arable land, restriction to transform biologically vulnerable grasslands to arable land.	Recurring		-	EAFRD
2.8	Voluntary activities through agri-environmental schemes to improve status of biodiversity and to develop green infrastructure (diversification of agricultural landscape, zones between conventional and organic farmers) – *measures included and overlap with measure in section E..1.2.*	Recurring		-	EAFRD
2.9	Support to ensure appropriate management of existing landscape elements and creation of new landscape elements	Recurring		300,000	EAFRD, LIFE, ERDF/CF, national funds

* indicate whether the measure is recurring or one-off

Expected results for targeted species and habitat types

Typical species of the semi-natural grassland can be found in buffer zones close to agricultural fields. Status of species connected to and affected by agriculture is maintained or improved – the farmland bird index increases.

The landscape elements are not just conserved, but appropriate management methods are used to prolong their life and improve their quality.

Expected results: other benefits

The quantity and quality of ecosystem services improves. Increases proportion of ecologically produced agricultural products.

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

Annex I woodlands and forests habitats covered in this section

12 woodland and forest habitat types listed in Annex 1 of the Habitats Directive occurring in Latvia are affected mainly by forestry activities. These are:

• Wooded dunes of the Atlantic, Continental and Boreal region (2180);

• Western Taiga (9010*);

• Fennoscandian hemiboreal natural old broad-leaved deciduous forests (*Quercus, Tilia, Acer, Fraxinus* or *Ulmus*) rich in epiphytes (9020*);

• Fennoscandian herb-rich forests with *Picea abies* (9050);

• Coniferous forests on, or connected to, glaciofluvial eskers (9060);

• Fennoscandian deciduous swamp woods (9080*);

• Sub-Atlantic and medio-European oak or oak-hornbeam forests of the *Carpinion betuli* (9160);

• *Tilio-Acerion* forests of slopes, screes and ravines (9180*);

• Bog woodland (91D0*);

• Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) (91E0*);

• Riparian mixed forests of *Quercus robur, Ulmus laevis* and *Ulmus minor*, *Fraxinus excelsior* or *Fraxinus angustifolia*, along the great rivers (*Ulmenion minoris*) (91F0);

• Central European lichen Scots pine forests (91T0).

Current status of habitats

While EU habitat mapping is not finished, and complete dataset collected, the data interpretation might be disputing and controversial. The PAF includes information and data which is based on 2/3 of inventoried area, knowing that some large and important Natura 2000 sites are not mapped yet. In any case, it is clear that regarding some forest habitat types Natura 2000 network must be revised and the protection regime must be improved within the existing Natura 2000 sites to prevent habitat destroying. Habitat types 9050 and 91T0 has not been distinguished previously therefore they are mapped for the first time. This may involve some additional research to define necessary management activities and protection regime as well as evaluation of the Natura 2000 network regarding the extent and sufficiency of the current coverage of these habitat types.

The information about areas of habitat types within Latvia, percentage of coverage in Natura 2000 sites, and habitat assessment of conservation status according to the Article 17 report is summarized in the table below. The percentage of habitat surface area inside Natura 2000 network is to be considered as indicative as EU habitat mapping continues.

EU habitat	Range	Area	Specific structure and function	Future prospects	Overall assesment of conservation statuss	Overall trend in conservation statuss	Area covered by habitat (max area in ha)	Surface area of habitat type inside Natura 2000 network (ha/%)
2180	FV	FV	U1	U1	U1	S	51,342–60,000	24,057/40%
9010*	FV	XX	U2	XX	U2	X	49,633–75,000	20,399/27%
9020*	FV	XX	U2	U1	U2	S	11,137–14,500	3,223/22%
9060	FV	FV	U2	U2	U2	X	1,626	747/45%
9080*	FV	U1	U2	U1	U2	D	22,322–25,000	6 141/24%
9160	FV	XX	U1	U1	U1	X	2,002	685/34%
9180*	FV	FV	U1	U1	U1	X	5,605–6,500	3,167/48%
91D0*	FV	U1	U1	U1	U1	S	60,240	19,974/33%
91E0*	FV	FV	U1	U1	U1	X	8,731	2,213/25%
91F0	FV	FV	U1	U1	U1	X	447–600	365/61%
91T0	XX	XX	U1	U1	U1	X	2,481	640/25%
9050	XX	XX	U2	U1	U2	X	11,415–11,600	2,745/23%

No data for trend assessment exists for several habitat types, as historical data, for example, from Natura 2000 monitoring (2008–2012) cannot be compared with the country-wide habitat inventory results. Due to the same reason favorable reference values and national, and site-level conservation objectives for these habitat types are not yet defined according to the developed national methodology, as this will be next task after completing of the EU habitat mapping process.

The range and area for all habitat types are in general favorable with some exceptions. The main reasons why the conservation status assessed as unfavorable-bad or unfavorable-inadequate are existing pressure from forestry sector leading to reduction of old growth forests, forest habitat fragmentation, and insufficient diversity of the forest habitat structures.

Conservation measures taken until now and their impact so far, remaining pressures and threats

Conservation measures during previous period include the revision and establishment of stricter zoning for several protected areas, leaving certain areas for natural development and creating stricter regulation for forestry activity. Several hundreds of microreserves both inside and outside Natura 2000 network have been established, mainly for bird species. Forest habitats have been restored or their quality has been improved, including restoration of water regime by implementing several LIFE projects. Private forest owners have received support (compensations) in Natura 2000 sites, as well as in microreserves where forestry operations are restricted or prohibited. Protected private forest land with strict restrictions can be sold to the state. Specific forest management plans are required for all private forest land units within Gauja National Park, Slītere National Park, and Ķemeri National Park. Forest management plans are being developed for regional units of the JSC "Latvia's State Forests", the company that manages most state owned (public) forests.

Main pressures and treats both inside and outside Natura 2000 network still are the same: forest management reducing old growth forests (including cutting, removal of all trees, change of hydrological regime, etc.). According to EU habitat mapping data if clear-cutting is applied next to a protected forest habitat, there are changes in the environment and, due to altered light and heat regime, some vulnerable species close to the border of habitat patch may vanish.

Other negative factors are natural processes of eutrophication or acidification, lack of natural disturbances (including fire) that causes overgrowth (main problem for habitat types 2180, 91T0, 9060). Specific threats and pressures for the forest habitats exist in the surroundings of Riga and other bigger cities and towns, i.e. these are risks of expansion of built-up area and increase of recreational pressure, as well as eutrophication, and invasive species.

Bird species

General forest bird index in long term is stable, but short-term trend is indistinct. Populations of old forest indicator species (for example, *Ciconia nigra*), and ground nesting birds (*Bonasa bonasia*) show negative trends. In forests, the priority bird species for which conservation-aimed actions are urgently required are *Clanga pomarina*, *Ciconia nigra*, and *Tetrao urogallus*.

Measures needed to maintain or restore favourable conservation status

1. Improvement in Natura 2000 network and habitat protection by different approaches (site designation, individual rules for Natura 2000 site management and protection) – see more detail in section E.1.1.

2. Improvement of the habitat conditions in microreserves for forest species connectivity (including *Tetrao urogallus*).

3. Restoring the structure of forest habitat types (including restoration of hydrological regime, imitation of natural disturbances, contributing to regeneration of tree species characteristic to natural forest, especially broad-leaved tree species and aspen) in Natura 2000 sites. Priority Natura 2000 sites, description of the measures and their expected target area as well as indicative costs are outlined in the National Conservation and Management Programme for the Natura 2000 Sites in Latvia, 2018–2030, https://nat-programme.daba.gov.lv/public/lat/publikacijas_un_dokumenti/#programma.

4. Compensation system for private forest owners in Natura 2000 sites and microreserves should be revised in order to facilitate the necessary management measures in the forests.

5. Support scheme for private forest owners to develop voluntary forest management plans that helps to minimize large scale impact from forestry activities to species and habitats.

6. Land purchase by the public institutions to secure the non-intervention management, in land purchase priority should be given to the land plot with the strictest restrictions of the economic activity.

7. Conservation and appropriate management of edge habitats (forest belts along streams and roads, forest edges in agricultural landscape) to ensure habitat connectivity.

8. Pilot project development by using special management methods, including different forestry and felling methods, targeted at preferred species composition and structure by creating potentially valuable habitats in habitat aggregation areas.

9. Development of forestry planning methods to develop optimal age structure, habitat suitability for species and connectivity at landscape level for aspen forests.

Prioritization of measures to be implemented during the next MFF period

All above listed measures are priority measures. Measures mentioned in the PAF will be used not only for allocation of the EU funding, but also domestically in preparation of the projects or requesting additional funding from national sources. The PAF will be used as the justifying document, therefore all mentioned measures are indicated as priorities.

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

No.	Name and short description of the measures	Type of measure*	Target (unit & quantity)	Estimated cost in Euros (annualised)	Possible EU co-funding source
1.1	Restoration management for 9080*, 91D0*, 91E0* in at least 50 sites for *Tetrao urogallus*, and at least 5 Natura 2000 sites. Activities include filling in and blocking the drainage ditches, removal of trees in undergrowth (mostly *Picea abies*), etc.	One-off	1,000 ha	500,000	EAFRD, ERDF/CF, national funds
1.2	Maintenance of habitat structures formed as a result of natural disturbances and emulation of natural disturbances (dead wood creation, gap creation of various size, burning etc.) Habitat types: 2180, 9060, 91T0, 9010*	One-Off	4,000 ha	714,290	EAFRD, national funds
1.3	Restoring the structure of forest habitat types (incl. restoration of hydrological regime, formative cutting, imitation of natural disturbances, contributing to regeneration of tree species characteristic to natural forest, especially broad-leaved tree species and aspen). Other habitat types	One-off	1,000 ha	428,570	ERDF/CF
1.4	Support scheme for private forest owners to develop voluntary forest management plans that helps to minimise large scale impact from forestry activities to species and habitats	One-off		214,290	EAFRD, LIFE IP, national funds
1.5	Compensations for private forest owners in Natura 2000 sites and micro reserves	Recurring		7,000,000	EAFRD state budget
1.6	Purchasing land with strict conservation restrictions for the state (average price 7,000–10,000 EUR/ha)	One-off	350 ha	500,000	State budget
1.7	Designation of aggregation areas of biologically valuable stands. Increasing continuity by including younger stands in the aggregation unit as potential future habitats with special management to increase their ecological value. *Costs included in section E1.1. as measure can be implemented by individual legislation of Natura 2000 sites*	Recurring		-	State budget, LIFE
1.8	Pilot projects for using special management methods, including different forestry and felling methods, forestry planning methods to develop optimal age structure, habitat suitability for species and connectivity at landscape level	One-off		500,000	EAFRD, LIFE IP, national funds

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

No.	Name and short description of the measures	Type of measure*	Target (Unit & quantity)	Estimated cost in Euros (annualised)	Possible EU co-funding source
2.1	Conservation of edge habitats (forest belts along streams and roads, forest edges in agricultural landscape)	Recurring			EAFRD
2.2	Improving the state of *Tetrao urogallus* habitats outside Natura 2000 areas	One-off	2,000 ha	71,430	

* indicate whether the measure is recurring or one-off

Expected results for targeted species and habitat types

The trend of forest species and habitat types is improving, for some habitat types and species improvement in conservation status. Priority Natura 2000 sites, description of the measures and their expected target area as well as indicative costs are outlined in the National Conservation and Management Programme for the Natura 2000 Sites in Latvia, 2018–2030, https://nat-programme.daba.gov.lv/public/lat/publikacijas_un_dokumenti/#programma.

Expected results: other benefits

Quantity and quality of ecosystem services improves. The climate policy and biodiversity policy complement each other. The local communities can use ecosystem services and forest landowners are stipulated and recompensed for provision of different ecosystem services (clean air and water, berries, mushrooms and other forest by-products, recreation).

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

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

Annex I rocky habitats, dunes and sparsely vegetated lands covered in this section

12 of habitat types of rocky habitats, dunes and sparsely vegetated lands listed in Annex I of the Habitats Directive occurring in Latvia are affected mainly by natural processes and high pressure from sport, leisure and tourism activities. These are:

- Calcareous rocky slopes with chasmophytic vegetation (8210);
- Siliceous rocky slopes with chasmophytic vegetation (8220);
- Annual vegetation of drift lines (1210);
- Perennial vegetation of stony banks (1220);
- Vegetated sea cliffs of the Atlantic and Baltic Coasts (1230);
- *Salicornia* and other annuals colonizing mud and sand (1310);
- Boreal Baltic sandy beaches with perennial vegetation (1640);
- Embryonic shifting dunes (2110);
- Shifting dunes along the shoreline with *Ammophila arenaria* ("white dunes") (2120);
- Inland dunes with open *Corynephorus* and *Agrostis* grasslands (2330);
- Fixed coastal dunes with herbaceous vegetation ("grey dunes") (2130*).

Current status of habitats

The information about areas of habitat types within Latvia, percentage of coverage in Natura 2000 sites, and habitat assessment of conservation status accordingly to Article 17 report is summarized in the table below. The percentage of habitat surface area inside Natura 2000 network should be considered as indicative as EU habitat mapping continues.

EU habitat	Range	Area	Specific structure and function	Future prospects	Overall assesment of conservation statuss	Overall trend in conservation statuss	Area covered by habitat (max area in ha)	Surface area of habitat type inside Natura 2000 network (ha/%)
1210	FV	U1	U2	U2	U2	D	24–26	11/42%
1220	FV	FV	U1	U1	U1	S	42–43	22/51%
1230	FV	FV	FV	FV	FV	S	56	10/18%
1310	FV	FV	U1	U1	U1	S	64	31/48%
1640	FV	U1	U1	U1	U1	D	63	41/65%

2110	FV	FV	U1	U1	U1	I	226	141/62%
2120	FV	U1	U1	U1	U1	S	502	340/68%
2130*	U1	U1	U2	U2	U2	X	2,025–2,100	1122/53%
2330	XX	XX	XX	XX	XX	D	46–50	4/8%
8210	FV	FV	FV	FV	FV	S	3	2/67%
8220	FV	FV	FV	FV	FV	S	15	10/67%

For majority of habitats trend assessment is stable. For some habitat types, trends are negative both due to natural coastal processes and increasing anthropogenic pressure. Favorable reference values and national, and site-level conservation objectives for these habitat types are not yet defined according to the developed national methodology, as this will be next task after completing EU habitat mapping process.

The range and area for all habitat types are mainly favorable with some exceptions (mainly due to coastal processes and anthropogenic pressure). Conservation status for all rocky habitat types is favorable. The assessment for coastal habitats is mainly U1 (unfavorable-inadequate); for the habitat 1210 – U2 (unfavorable-bad) – this is a habitat that is negatively affected by development and maintenance of beach areas for tourism and recreation including beach nourishment and beach cleaning; for habitat 2130* – U2 (unfavorable-bad) – mainly due to inadequate management to stop succession or too high pressure from leisure and tourism activities. For habitat 2330, currently there is only one Natura 2000 site where the habitat is present is "Sventājas upes ieleja" (LV0526400).

The conservation status of *Bufo calamita* is assessed as U2 (unfavorable-bad), for *Linaria loeselii*, *Dianthus arenarius* spp. *arenaruis* – U1 (unfavorable-inadequate).

Conservation measures taken until now and their impact so far, remaining pressures and threats

The management plan to conserve places with algae sediments and to find balance between sediment collection and natural processes to allow development of habitat 1210 has been developed.

Conservation measures during previous period has been development of tourism infrastructure both in Natura 2000 network and outside to regulate anthropogenic pressure and redirect the tourism flows. However, due to total length of the coastline the anthropogenic pressure increases, especially close to the cities.

For rocky habitats, main threats and pressures are abiotic factors, sports, tourism and leisure activities. Existing tourism interests and traditions (rocky habitats are important tourist attractions with well-developed tourism infrastructure) provide habitat conservation. Serious erosion damage has not been found.

For coastal habitats, main threats and pressures are natural processes and abiotic factors, storms, as well as problematic native species, invasive alien species (other than those of EU concern), development and maintenance of beach areas for tourism and recreation, modification of coastline for development, use and protection of residential, commercial, industrial and recreational infrastructure, sports, tourism, and leisure activities.

Bird species

Trends in bird populations (*Sterna paradisaea, Sternula albifrons, Tadorna tadorna, Charadrius hiaticula, Anthus campestris*) associated with these habitats are negative, although the populations of some bird species are stable or increasing.

Measures needed to maintain or restore favourable conservation status

1. Diminishing negative anthropogenic pressures by developing, maintaining, and improving the existing tourism infrastructure in sites of visitor interest for rocky habitats and in coastal areas (measures for tourism infrastructure included in section E.1.5).

2. Planning of large public events on the beach and in the coastal area outside the breeding season of amphibians and birds and outside habitat rich areas. It can be done on daily basis issuing permits and in communication with stakeholders (communication activities covered within section E.1.5.).

3. Restoration of grey dunes (2130*) and inland dunes (2330) and habitat quality improvement measures, which also improves the status of respective species.

4. Agri-environmental schemes for recurring management of existing and restored grey dunes and inland dunes.

5. Appropriate beach management and environmentally friendly shore strengthening measures (creating new sandbanks by branch fencing, grass plantation).

Prioritization of measures to be implemented during the next MFF period

All above listed measures are priority measures. Measures mentioned in the PAF will be used not only for allocation of the EU funding, but also domestically in preparation of the projects or requesting additional funding from national sources. PAF will be used as justifying document, therefore all mentioned measures are indicated as priorities.

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

No.	Name and short description of the measures	Type of measure*	Target (unit & quantity)	Estimated cost in Euros (annualised)	Possible EU co-funding source
1.1	Restoration of inland dunes (2330) and grey dunes (2130*) (heavy restoration in degraded existing surfaces: scraping, trees and shrubs cutting) average cost per ha: 2,000 €	One-off	200 ha	57,150	ERDF/CF
1.2	Agri-environmental schemes for recurring management of existing and restored inland dunes (2330) and grey dunes (2130*) average cost/ha/year: 300 €	Recurring	200 ha	60,000	EAFRD
1.3	Restoration of open dune system communities (creating new sandbanks by branch fencing, grass plantation).	One-off	5 km	71,430	ERDF/CF

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

No.	Name and short description of the measures	Type of measure*	Target (unit & quantity)	Estimated cost in Euros (annualised)	Possible EU co-funding source
2.1	Restoration of inland dunes (2330) and grey dunes (2130*) (heavy restoration in degraded existing surfaces: scraping, trees and shrubs cutting) outside Natura 2000 network (green infrastructure) average cost per ha: 2,000 €	One-off	50 ha	14,260	LIFE, ERDF/CF
2.2	Agri-environmental schemes for recurring management of existing and restored inland dunes (2330) and grey dunes (2130*) outside Natura 2000 network (green infrastructure) average cost/ha/year: 300 €	Recurring	100 ha	30,000	EAFRD
2.3	Restoration of open dune system communities (creating new sandbanks by branch fencing, grass plantation) outside Natura 2000 network (green infrastructure).	One-off	3 km	42,860	ERDF/CF

* indicate whether the measure is recurring or one-off

Expected results for targeted species and habitat types

A full implementation of the prioritized restoration and management measures targeting habitats is expected to lead by 2028 to substantial improvement of the structures and functions of the targeted habitat types, especially for habitat 2130*.
Improvements in habitat quality will benefit habitat specific species. The better planning of public events will minimise anthropogenic pressure on amphibian and bird species.

Expected results: other benefits

Improved quality and quantity of ecosystem services in coastal areas. Stable populations of threatened species. Appropriate management according to sand beaches and primary dune habitats is ensured in all coastal zone.

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

Annex I freshwater habitats covered in this section
7 of habitat types of freshwater habitats listed in Annex I of the Habitats Directive occurring in Latvia are affected mainly by pollution. These are:
• Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoëto-Nanojuncetea* (3130);
• Hard oligo-mesotrophic waters with benthic vegetation of *Chara spp*. (3140);
• Natural eutrophic lakes with *Magnopotamion* or *Hydrocharition*-type vegetation (3150);
• Natural dystrophic lakes and ponds (3160);
• Lakes of gypsum karst (3190);
• Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation (3260);
• Rivers with muddy banks with *Chenopodion rubri* p.p. and *Bidention* p.p. vegetation (3270).
Current status of habitats
The information about areas of habitat types within Latvia, percentage of coverage in Natura 2000 sites, and habitat assessment of conservation status accordingly to Article 17 report is summarized in the table below. The percentage of habitat surface area inside Natura 2000 network is to be considered as indicative as EU habitat mapping continues.

EU habitat	Range	Area	Specific structure and function	Future prospects	Overall assesment of conservation statuss	Overall trend in conservation statuss	Area covered by habitat (max area in ha)	Surface area of habitat type inside Natura 2000 network (ha/%)
3130	U1	U1	U2	U2	U2	D	5370	2,820/52%
3140	FV	U1	U1	U1	U1	X	7,620–11,430	6,580/58%
3150	FV	FV	U1	U1	U1	S	47,260–70,890	26,160/37%
3160	FV	FV	FV	FV	FV	S	1,520–2,280	2,260/ 99%
3190	FV	FV	XX	XX	XX		28–42	24/57%
3260	FV	U1	U1	U1	U1	S	13,460–20,190	4,660/23%
3270	XX	XX	XX	XX	XX	X	6–9	

For majority of habitats trend assessment is stable, except habitat 3130 which trend is negative both due to natural processes and increasing anthropogenic pressure. Favorable reference values and national, and site-level conservation objectives for these habitat types are not yet defined according to the developed national methodology, as this will be next task after completing EU habitat mapping process.

The evaluation of conservation status for all habitat types are mainly U1 (unfavorable-inadequate) (mainly due to habitat specific structures and functions that are negatively affected by historical and existing pollution and regulation of hydrological regime). For habitat 3130, conservation status is evaluated as U2 (unfavorable-bad).

The status of *Margaritifera margaritifera* and *Najas flexilis* is assessed as U2 (unfavorable-bad), for *Najas tenuissima* – U1 (unfavourable-inadequate).

Conservation measures taken until now and their impact so far, remaining pressures and threats

Measures taken include restoration of river habitats, restoring fish migration routes, spawning grounds ,and management of beaches near lakes in public areas. The Water Framework Directive, the Nitrate Directive and the Pesticides Directive also contribute through their obligations and related measures to the improvement of freshwater habitats. Projects regarding habitat management have been funded by the CF, LIFE and national funds, but most freshwater habitats in Latvia are not adequately managed for the maintenance and improvement of structures and functions. As concerns running water habitats, pressures are numerous and threats remain, for instance reclamation of stretches of natural rivers, flooding modifications, increase of arable land that have impact on water quality. Other threats and pressures are agricultural activities generating point source pollution and diffuse pollution to surface or ground waters, pollution to surface or ground water due to urban run-offs, sports, tourism and leisure activities, forestry activities, for 3160 – peat extraction.

In 2019 the LIFE IP "Implementation of River Basin Management Plans of Latvia towards good surface water status" (LIFE18 IPE/LV/000014, LIFE GOODWATER IP) has been approved. Although focus of this LIFE IP project is not Natura 2000 sites, it is expected that measures and approaches tested and applied within this project will be beneficial also for freshwater habitats of the EU importance. Therefore, synergies between LIFE IP and projects in the nature conservation area should be sought.

Measures needed to maintain or restore favourable conservation status

It is necessary to implement investment-intensive actions – active demolition of dams on rivers, river restoration in its natural state and restoration of water levels in lakes with historically lowered water levels. These actions are subject to environmental impact assessment and require large resources and political support.

Taking this into account, the awareness building activities must be done beforehand, by testing restoration methods on smaller pilot areas to show the benefits of these activities.

The management activities to improve habitat quality of the waterbodies should be implemented both inside and outside Natura 2000 network as waterbodies are often connected. Activities with high public acceptance such as opening fish migration routes, restoring spawning grounds, control the number of beavers and elimination of their dams and tree falls, management of lake habitats (regular reed mowing, shore care) should be continued.

The species conservation actions for mussels are critical. Active management measures are required to ensure necessary habitat quality to ensure improvement of populations of bivalve species (*Unio crassus, Margaritifera margaritifera*). That includes also active management of problematic native species (*Castor fiber*). For species actions see section E.2.10.

For improvement of populations of birds feeding in water bodies or in their edges, and for birds breeding or feeding in vegetation belts bordering water bodies (*Botaurus stellaris, Gallinago gallinago, Porzana porzana*, etc.) maintenance of coastal vegetation areas is necessary to increase the biological quality.

Information campaigns and practical measures are necessary to reduce impact of invasive alien species (invasive crustacea, *Perccottus glenii*) to protect native species.

The reduction of intensive agricultural practice in river basins – buffer areas around water courses with grasslands or forests, erosion prevention, decrease of arable land on belts around rivers and lakes, decrease of pesticides and fertilizers use, change in agricultural practices would help to reduce impact from pollution. Several measures are already covered in previous sections.

Prioritization of measures to be implemented during the next MFF period

All above listed measures are priority measures. Measures mentioned in the PAF will be used not only for allocation of the EU funding, but also domestically in preparation of the projects or requesting additional funding from national sources. The PAF will be used as the justifying document, therefore all mentioned measures are indicated as priorities.

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

No.	Name and short description of the measures	Type of measure*	Target (unit & quantity)	Estimated cost in Euros (annualised)	Possible EU co-funding source
1.1	Restoration of lake habitats, incl. restoration of water levels (in lakes with lowered water levels) – habitats 3130, 3140, 3150)	One-off	4,000 ha	357,150	ERDF/CF
1.2	Management of lake habitats (regular reed mowing, shore care) – habitats 3130, 3140, 3150)	Recurring	4,000 ha	115,000	National funds, state and municipality budget, EMFF
1.3	Restoration of river habitats (3260) – restoring fish spawning grounds, elimination of beaver dams and tree falls	Recurring	200 ha	350,000	ERDF/CF, EMFF
1.4	Demolition of artificial dams on rivers / fish road construction (2 rivers)	One-off		600,000	LIFE, EMFF, ERDF/CF, national funds, other projects

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

No.	Name and short description of the measures	Type of measure*	Target (unit & quantity)	Estimated cost in Euros (annualised)	Possible EU co-funding source
2.1	A ban on support for new drainage systems in wetlands (including forest areas). If it is necessary to adapt to climate change, only environmentally friendly drainage systems should be supported	Recurring		-	LIFE, EMFF, ERDF/CF, national funds, other projects, EAFRD
2.2	A restriction to transform belts around waterbodies in arable land.	Recurring		-	EAFRD
2.3	Restoration of river habitats (3260) – restoring fish spawning grounds, elimination of beaver dams and tree falls	Recurring	80 ha	140,000	LIFE, ERDF/CF, EMFF, national funds, other projects
2.4	Management of lake habitats (regular reed mowing, shore care) – habitats 3130, 3140, 3150)	Recurring	2,000 ha	75,000	LIFE, ERDF/CF, EMFF, national funds, other projects
2.5	Voluntary activities through agri-environmental schemes to improve status of biodiversity and to develop green infrastructure (management of protection belts for biodiversity, management of waterbodies coastlines for birds) – *measures included and overlap with measure in section E.2.1.*	Recurring		-	EAFRD
2.6	Development of blue infrastructure (in territorial planning freshwater habitat management is covered)	Recurring		-	LIFE, ERDF/CF, state budget, other projects
2.7	Practical measures to reduce impact of invasive alien species (invasive crustacea, *Perccottus glenii*)	Recurring		20,000	National funds, LIFE

* indicate whether the measure is recurring or one-off

Expected results for targeted species and habitat types

The status of freshwater habitats improves (trends are stable or increasing). The conservation status of species that inhabit and depend on freshwater habitats is improving (trends are stable or increasing).

Expected results: other benefits

The number of waterbodies with increased water and quality increases. The quantity and quality of ecosystem services improves. The anthropogenic pressure on water bodies from leisure activities are more regulated.

E.2.9. Others (caves, etc.)

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

Annex I habitats covered in this section and current status Caves not open to the public (8310) are in favourable conservation status, and 85% of them are in Natura 2000 areas. This habitat is important for some moss species and hibernation sites of seven bat species: *Eptesicus nilssonii*, *Plecotus auritus*, *Myotis daubentonii*, *M. dasycneme*, *M. brandtii, M. mystacinus*, and *M. nattereri*. The conservation status of bats wintering is mostly assessed as favourable, for some species – U2 (bad-inadequate) (*Plecotus auratus, M. dasycneme*), for *M. mystacinus* – unknown. Conservation measures taken until now and their impact so far, remaining pressures and threats Since rocky slopes and caves are rare in Latvia, they are often popular visitor destinations, thus being highly threatened by mechanic disturbances such as trampling and scratching, and human disturbances in bat hibernation places. The information about bat hibernation places is considered planning tourism infrastructure. The regular communication with tourism operators takes place to minimise pressure from visitors on habitat and bat species.

Measures needed to maintain or restore favourable conservation status

Communication activities to reduce tourist visits to the bat hibernation locations (measures covered in section E.1.2). Planning of tourism infrastructure to avoid impact from visitors (measures in section E.1.5).

Prioritization of measures to be implemented during the next MFF period

N

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
Measure 1				
Measure 2				
etc.				

- 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
Measure 1				
Measure 2				
etc.				

* indicate whether the measure is recurring or one-off

Expected results for targeted species and habitat types

The conservation status of the habitat is favourable. Conservation status of bats and other species associated with caves is improving.

Expected results: other benefits

Visitors and tourism operators in protected areas are more informed about damage they can cause to bat species and respect rules of protected areas.

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

Article 17 report https://www.eea.europa.eu/themes/biodiversity/state-of-nature-in-the-eu/article-17-national-summary-dashboards/conservation-status-and-trends Article 12 report https://www.eea.europa.eu/themes/biodiversity/state-of-nature-in-the-eu/article-12-national-summary-dashboards National conservation and management program for the Natura 2000 sites in Latvia, 2018-2030. https://nat-programme.daba.gov.lv/public/lat/publikacijas_un_dokumenti/#programma Natura 2000 management plans https://www.daba.gov.lv/public/lat/iadt/dabas_aizsardzibas_plani/ Species and habitat management plans https://www.daba.gov.lv/public/lat/dati1/sugu_un_biotopu_aizsardzibas_plani/ Reports of biodiversity monitoring https://www.daba.gov.lv/public/lat/dati1/biologiskas_daudzveidibas_monitoringa_dati/ Specific research data in protected areas https://www.daba.gov.lv/public/lat/publikacijas/zinatnisko_petijumu_materiali/

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

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

Current status of the species

Due to the geographic position of Latvia, many species reach here the limit of their distribution. There are 115 species of the Habitat Directive occurring in Latvia (34 invertebrate, 14 fish, 14 amphibian and reptile, 30 mammal, 16 vascular plant, and 7 non-vascular plant species). According to the Habitats Directive's Article 17 report, 41% of species are in a favourable conservation status, 36% species are in an unfavourable-inadequate status, and 14% of species is in an unfavourable-bad conservation status. For nine species there is not enough information to evaluate conservation status. The biggest threats to species are the shrinkage of the area of suitable habitats, species habitat quality, deterioration of living conditions, and fragmentation, including loss of dispersal routes. Land use change (e.g. overgrowing of meadows, forest clear-cut, water pollution and changes in hydrologic regime) also reduces the suitability of habitats for many species. Threats to species include loss of biodiversity in cultural landscapes and impacts of densely populated areas. For bat species, there are problems with preservation of their hibernation sites in buildings. In total 218 bird species are nesting in Latvia. According to the latest Article 12 report under the Birds Directive, the long-term trend for 82 species (38%) is increasing, for 69 species (32%) decreasing, for 20 species (9%) – stable, for 12 species (5%) – unclear, for 2 species – fluctuating, for 33 species (15%) there are no enough data to calculate the population trends. Over the last decades, changes in land use and land use intensity (e.g. increasing forest clearance, increasing cover of young forest plantations, forest fragmentation, from one side abandonment, from other side – intensification of agricultural lands) have

caused both decline and increase in different bird species populations. Both abandonment and intensification in the use of agricultural lands have caused changes in bird species related to agricultural lands, e.g. decline in populations of *Crex crex* and some other grassland-related species. In forests, the priority bird species for which conservation-aimed actions are urgently required are *Clanga pomarina, Ciconia nigra*, and *Tetrao urogallus*. In agricultural lands, numerous species suffer from overgrowing of semi-natural grassland habitats, among them as priorities *Crex crex, Gallinago media*, *Clanga pomarina* and *Philomachus pugnax* should be mentioned.

The construction of various linear infrastructures is planned (railway, roads, power lines), which may fragment species habitats and have impact on species migration. In some Natura 2000 management plans and species management plans the measures are indicated to mitigate the negative impact of linear infrastructures on biodiversity.

Invasive alien species (IAS) pose a significant threat to native species and, in some cases, to ecosystem functions. There are 10 IAS regulation[15] species occurring in the wild in Latvia, in captivity or commercially available – 8 species, but additionally at national level 33 other than IAS regulation species are assessed as invasive. Several IAS, both plant and animal species, cause damage to ecosystems and native species also in Latvia, e.g. *Heracleum sosnowskyi, Impatiens glandulifera, Rosa rugosa, Mustela vison, Nyctereutes procyonoides,* etc., while numerous IAS are expected to become important threats for native biodiversity in near future. The eradication is taking place mainly for *Heracleum sosnowskyi*, some mechanisms developed to reduce number of alien crayfish (*Pacifastacus leniusculus* and *Orconectes limosus*) species, the measures for *Perccottus glenii* and *Trachemys scripta* has been implemented to reduce its impact on endangered amhibians. In 2018, the species management plan for *Arion vulgaris* has been developed. In the recent years, *Arion vulgaris* is rapidly spreading all over the country. Although damage caused by this species can be easier seen in the gardens and on agriculture lands, the eradication measures should be urgently undertaken to prevent species from occupying high biodiversity areas.

Measures needed to maintain or restore favourable conservation status

The actions covered in other sections of the PAF will have positive impact on rare and threatened species conservation. Measures mentioned here must be considered as additional measures to those mentioned in other section of the PAF.

For buildings where hibernation sites of bats occur, it is necessary to improve building management practice, in some cases by appropriate building reconstruction or closure for visitors.

The measures to mitigate the negative impact of linear infrastructures must be implemented for amphibians. The guidelines and solutions for improvement of new infrastructure (including animal tunnels, passages) must be developed to avoid defragmentation of animal populations (i.e. development of Rail Baltica). The eco-friendly approaches to manage the sides of roads and railways (thus both improving biodiversity and reducing IAS pathways) should be developed and implemented.

Revision and improvement of the management and monitoring system for invasive species at national level is necessary – the measures for legislation and research are covered in sections E.1.1., E1.3., E.1.4. Other measures for IAS are development of a common risk assessment methods for invasive alien terrestrial and freshwater plant and animal species, development of criteria for the prioritization of IAS, based on the risk assessment, development of early detection and rapid eradication systems for invasive alien species. Additional measures are necessary to manage and eradicate IAS other than giant hogweed *Heracleum sosnowskyi* and raise the awareness of the general public about IAS. The public campaigns (including seminars, questionnaires, and surveys) for landowners about invasive alien species (IAS) and tools to motivate eradication and or management of IAS are important (informative campaigns partly covered in section E.1.5) – here informative campaigns are focused to eradication methods. The development and testing of IAS eradication methods must be conducted. The pilot sites where IAS eradication methods used and have been effective could be used for public campaigns and landowner involvement. Emphasis must be

[15] Regulation No 1143/2014 of the European Parliament and of the Council of 22 October 2014 on the prevention and management of the introduction and spread of invasive alien species.

put on the most aggressive species where there is lack knowledge on cost-effective methods, for example, *Rosa rugosa*, *Impatiens glandulifera*, *Solidago spp*. (*Solidago canadensis, Solidago gigantea*), *Acer negundo*. These species occur in several Natura 2000 sites management plans of which foresee eradication of these IAS. Attention must be paid to innovative, cost-effective, replicable, and eco-friendly methods of IAS eradication. To ensure that IAS eradication is taking place at national level and with high priority, management plans for IAS eradication must be developed with clear goals, measures and responsibilities. The implementation of the measures provided in the species management plan for *Arion vulgaris*.

Prioritization of measures to be implemented during the next MFF period

All the above listed measures are priority measures.

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

No.	Name and short description of the measures	Type of measure*	Target (unit & quantity)	Estimated cost in Euros (annualised)	Possible EU co-funding source
1	Reconstruction and/or closing for visitors hibernation sites of bats in buildings	One-off		400,000	LIFE, ERDF/CF, national funds, other projects
2	Management activities to mitigate the negative impact of linear infrastructures for amphibians	One-off		214,290	ERDF/CF
3	Management activities to mitigate the negative impact of linear infrastructures for amphibians (fences)	Recurring		30,000	
4	The development and implementation of solutions for new infrastructure (incl. animal tunnels, pass ways) to avoid fragmentation of animal populations	One-off		1,285,720	ERDF/CF
5	The development and implementation of eco-friendly approaches to manage the sides of roads and railways	One-off		214,290	ERDF/CF, LIFE, LIFE IP, national funds, other projects
6	Eradication of invasive alien species	One-off	10,000 ha	600,000	
7	Eradication of invasive animal species (other than covered by section E.2.8)	Recurring		20,000	National funds, other projects
8	Communication and aware raising about IAS eradication measures	Recurring		10,000	LIFE IP, national funds, other projects

* indicate whether the measure is recurring or one-off

Expected results for targeted species

The status of native species is improving. The bat hibernation sites are appropriately managed. The negative impact of linear infrastructure objects on species migration is foreseen and mitigation measures implemented. The management and supervision of IAS is fully implemented. The most dangerous or charismatic IAS are eradicated or at least their spread is under control.

Expected results: other benefits

Improved quantity and quality of ecosystem services.

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

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

According to the Regulation of the Cabinet of Ministers, compensations are provided for damage caused by non-game and migratory species. In accordance with the regulation, damage is compensated if it is caused by *Ardea cinerea, Egretta alba, Larus ridibundus, Larus minutus, Phalacrocorax carbo, Pandion haliaetus, Haliaeetus albicilla, Lutra lutra, Ursus arctos* as well as migratory bird species, such as cranes, geese and swans. The procedure and method for calculation of the damage is provided in the national regulation https://likumi.lv/ta/id/282681-kartiba-kada-zemes-ipasniekiem-vai-lietotajiem-nosakami-to-zaudejumu-apmeri-kas-saistiti-ar-ipasi-aizsargajamo-nemedijamo-sugu-...

The extent of damage caused depends on the subject of the compensation. For fish ponds (aquaculture), the damage is caused by sedentary fish-eating bird species and otters. Although the regulation requires that the certain prevention measures have to be undertaken by the owners of the fish ponds, however, for majority of the damage assessed preventive measures cannot be taken since the fish ponds are located in Natura 2000 sites designated for the protection of the bird species. These ponds are also included in the IBA list for Latvia.

Damage for beekeeping and cattle is mainly caused by brown bear, the number of which raises every year.

During the latest years, the biggest amount of compensations is paid for the damage caused by the migratory birds (geese, cranes, swans) which for different reasons stay on fields longer than previously. The preventive measures include different devices for scaring off the birds (scarecrow, sound cannons, etc.) but these measures turned to be ineffective due to large number of the birds.

During the period 2016–2019 compensation paid from the state budget constitute:

- for crop production – 879,969.57 EUR;

- for aquaculture – 584,306.13 EUR;

- for cattle breeding, beekeeping – 9,986.92 EUR.

The compensation scheme is agreed with the EC state aid guidelines of 2019 (see the EC decisions SA.53793 and SA.53792). The scheme will start in 2020 after the approval of the respective regulation by the Government, and it will be valid till 2025. Therefore, it is necessary to timely seek either for continuation of the scheme or to propose new scheme which reconciles interests of the private landowner and nature conservation.

Measures needed

Development of compensation system to compensate damages for fishery caused by seals.

Preventive investments to reduce damage caused by non-game and migratory species (seal and bird-proof fishing gear, predator proof fences, devices to drive off the birds, etc.).

Revision of existing regulations to compensate damages caused by non-game and migratory species taking into account the EU state aid guidelines after 2025.

Prioritization of measures to be implemented during the next MFF period

All the above listed measures are priority measures.

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

No.	Name and short description of the measures	Type of measure*	Target (unit & quantity)	Estimated cost in Euros (annualised)	Possible EU co-funding source
1	Compensation for damages caused by seals, non-game species and migratory birds	Recurring		1,500,000	EMFF, state budget
2	Preventive investments to reduce damages of non-game and migratory species – *measures included overlap with measure in section E.1.2*	Recurring		-	EAFRD, EMFF, state budget
3	Revision of legislation system - *measures included overlap with measure in section E.1.1*	One-off		-	State budget, LIFE IP

* indicate whether the measure is recurring or one-off

Expected results for targeted species

The status of wildlife species populations is stable. The preventive investments help to reduce damages. The procedures for compensating the damage caused by non-game and migratory species are cost-effective and in compliance with EU state aid guidelines.

Expected results: other benefits

Farmers and fisherman attitude towards nature conservation and protected animal species improves

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

Species management plans for otter, wolf, bear, lynx
https://www.daba.gov.lv/public/lat/dati1/sugu_un_biotopu_aizsardzibas_plani/.

Species plans for seals and bat species are in preparation.

3. Further added values of the prioritized measures

The biodiversity status would improve beyond the objectives of the Natura 2000 network if measures described in the PAF will be implemented. The proposed measures will contribute to the implementation of the Habitats and Birds Directives. Moreover, the proposed measures complement measures for climate change mitigation and adaptation, air and water quality, research, and education.

Public awareness about the importance of biodiversity and necessary management actions will increase.

There can be considerable socio-economic impact: development of sustainable nature tourism, small producers, eco-friendly trademarks, return of semi-natural grasslands into production.