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Pilot Management Plan of the Emerald Site Ijevan (AM0000005) in Armenia

Action implemented by:

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Contents

Acronyms and abbreviations

ESMP	Emerald Site Management Plan
EU	European Union
EU4Environment	The “European Union for Environment” (EU4Environment) Action
FE	Forest Enterprise
FMP	Forest Management Plan
GEF	Global Environment Facility
GIZ	German Agency for International Cooperation (*Deutsche Gesellschaft für Internationale Zusammenarbeit*)
IBA	Important Bird Areas
IoB	Institute of Botany
IPA	Important Plant Areas
KBA	Key Biodiversity Areas
LSE	Lesser-Spotted Eagle
MoE	Ministry of Environment
MP	Management Plan
NGO	Non-governmental Organization
OECD	Organisation for Economic Co-operation and Development
SAC	Special Area of Conservation
SCI	Site of Community Importance
SDF	Standard Data Form
SNCO	State Non-commercial Organization
SPA	Special Protected Area
SPNA	Specially Protected Nature Area
SWOT	Strengths, Weaknesses, Opportunities, Threats
UNDP	United Nations Development Programme
UNECE	United Nations Economic Commission for Europe
UNEP	United Nations Environment Programme
UNIDO	United Nations Industrial Development Organization
USAID	United States Agency for International Development

Definitions

- **Conservation degree**[1]**:** The result of an evaluation of the status of a species or habitat type at the local scale (that is, protected area or country).
- **Conservation status:** The result of an evaluation of the status of a species or habitat type at the biogeographical scale.
- **Conservation objectives**[2]**:** Measurable indicators that are linked to concrete species and habitats and can be used for further monitoring. **Conservation objectives need to be as clear and straightforward as possible and allow us to put in place operational conservation measures in practice. They need to be specified in concrete terms and wherever possible quantifiable in numbers and/or size.**[3] They should include the following:
    - Conservation or growth of the species population
    - Conservation or growth of the area's habitat types
    - Conservation or enhancement of species habitat quality (thus improving the degree of conservation of one or more habitat types)
    - Maintaining or improving the degree of conservation of a habitat type.
- **Conservation measures:** The actual mechanisms and actions to be put in place for an Emerald site with the aim of achieving the site's conservation objectives. The measures can be active and passive (nonintervention).
- **Cross-border ecological corridor:** A cross-border geographical space, determined on a managerial and scientific basis, that contains a combination of ecosystems characterized by relief forms and plantation cover and is of importance for the protection of biodiversity and landscapes.
- **Designated sites/areas:** State Reserves, National Parks, and sanctuaries of Armenia, under Armenia legislation.
- **Ecological character of an Emerald Network site:** The combination of ecosystem components, processes, and other ecological features or characteristics that contribute to the quality and functioning of the site.
- **Emerald site management:** The implementation of the necessary conservation measures, either active or passive, to maintain or increase species population sizes or quality and the habitat area. All other aspects of Emerald site 'management' are also important, but they must all be aligned with and adjusted to this primary objective.
- **Other lands:** State, community, and private lands of Armenia.

[1] Evans, D., and M. Arvela. 2011. *Assessment and Reporting under Article 17 of the Habitats Directive: Explanatory Notes & Guidelines for the period 2007–2012 - Final Draft.* European Topic Centre on Biological Diversity. https://circabc.europa.eu/sd/a/2c12cea2-f827-4bdb-bb56-3731c9fd8b40/Art17-Guidelines-final.pdf

[2] "Managing Natura 2000 Sites. The Provisions of Article 6 of the 'Habitats' Directive 92/43/EEC." https://op.europa.eu/en/publication-detail/-/publication/11e4ee91-2a8a-11e9-8d04-01aa75ed71a1 (2.3.1. Setting site-level conservation objectives).

[3] https://circabc.europa.eu/sd/a/68834981-033a-4d8e-b306-54dd8b6f48fa/Commission%20note%20on%20setting%20conservation%20objectives.pdf

Introduction

General information and definitions

Study assignment details

The pilot Emerald Site Management Plan (ESMP) of Ijevan (AM0000005) is conducted under Task 3: *Test the recommendations for the management of Emerald sites using 2 sites as case studies*, of the European Union for Environment (EU4Environment) Program. The Ijevan site represents a case study with low pressures and threats to target objects, a significant forest (and pasture) area under active management, and almost no operations taking place. This is different from the second case of the Armash site that has a significant anthropogenic operation in the area such as the freshwater fisheries, rising pressures due to land use changes trend, and water-sensitive target objects.

The current ESMP is based on the 2023–2024 Ijevan (AM0000005) recommended borders and revised list of species and habitats, under the EU4Environment Program.

The current ESMP is a demonstration case for Armenia, especially in terms of the method used to assess the site conservation degree, conservation objectives, and conservation measures. The method followed is applied in Natura 2000 management plans (MPs) selected from the latest EU release of pressure and conservation measures code lists. The latter is a standard list used for Natura 2000 to report information on pressures and threats for the Art 17 species, habitat, and the Art 12 bird species. The method may cause the least inconsistencies and promote a uniform standardized way of assessing ESMPs in Armenia. This will also help better equip and create capacities among the Armenia experts and competent authorities with methodologies aligned to Natura 2000. This will be an advantage in future use (for example, in EU LIFE+ program and others) and future Emerald barometer management and monitoring indicators.

In addition, the ESMP is locally adopted and simplified in several points and according to the available information and capacities in the country. Therefore, the MP is not comprehensive. Nevertheless, the objectives are strongly supported, and all necessary MP items are fulfilled to a certain level, based on the MP-recommended guidelines.

The key MP components include presenting the conservation degree and status of the conservation objects. For specific habitats and species, the pressures and threats are further analyzed and respective management measures are proposed. The MP recommendations are proposed for a 10-year time span through an Action Plan (Annex B). The Action Plan also includes midterm evaluation reporting.

The Ministry of Environment (MoE) is advised to consider reviewing, finalizing, and then approving the current ESMP as well as to implement and monitor the performance of the conservation measures throughout the MP lifetime. Most importantly, the Armenia government should provide the necessary framework and tools to implement and assess the current (and future) action and monitoring plan proposed. The new Eco Patrol Service Law is key to achieving this.[4] Once the Eco Patrol Service initiates its activities in the study area, it is important to be informed - by MoE - on the overall MP objectives, the site importance, and conservation measures. Attention must be given to specific protection management measures of the Action Plan such as control/eradication of illegal killing.

In addition, as discussed in the first capacity-building session ("Introduction to Emerald site conservation management and monitoring aspects," February 28, 2024), there is also no standard framework to follow for stakeholder engagement and adaptive management throughout the cycle of the MP.

The ESMP and recommendations described were designed by a team of local and international experts in habitats, plants, avifauna, reptiles, invertebrates, and mammals.

[4] https://www.arlis.am/DocumentView.aspx?DocID=186692

It should be emphasized that regular monitoring is a necessity and included in the Action Plan. Field data, empirical evidence, and scientific research will also help identify the potential contradictive measures (for example, controlling overgrazing in the habitat area of target birds).

The site has an excellent conservation degree with low pressures and threats to the habitat and target species and plants, with almost no operations taking place apart from mild - though rising - activities such as uncontrolled woodcutting, livestock, and tourism. The current study also examines and assesses the forest enterprise (FE) MP measures and provides - if needed - recommendations. Also, it is a challenging site in terms of relief and accessibility and a comprehensive monitoring of all target species, for example, avifauna, is difficult considering the technical resources available in the country. Therefore, the proposed monitoring plan allows for species-specific monitoring.

During the implementation of communication, education, and awareness raising, a training/consultation meeting with local stakeholders was undertaken in mid-March 2024 for a broad and open public engagement. The local views were considered during the current MP review and finalization.

Structure and process flow of the ESMP

The current ESMP structure was based on the EU4Environment Program recommendations for preparing and developing a standalone full-scale comprehensive Emerald MP.[5]

The MP has a set of consecutive phases from MP preplanning and preparation till finalization, development, review, implementation, monitoring, and revision of the conservation measures through adaptive management (Figure 1). Also, as proposed in the Guidelines for preparing an Emerald MP, a field study/inventory is necessary and should always be complementary to the existing Species Distribution Framework information.

The biodiversity information presented below is mainly from desktop analysis with no specific field sampling/monitoring taking place but also includes new data based on personal field investigations (for avifauna).

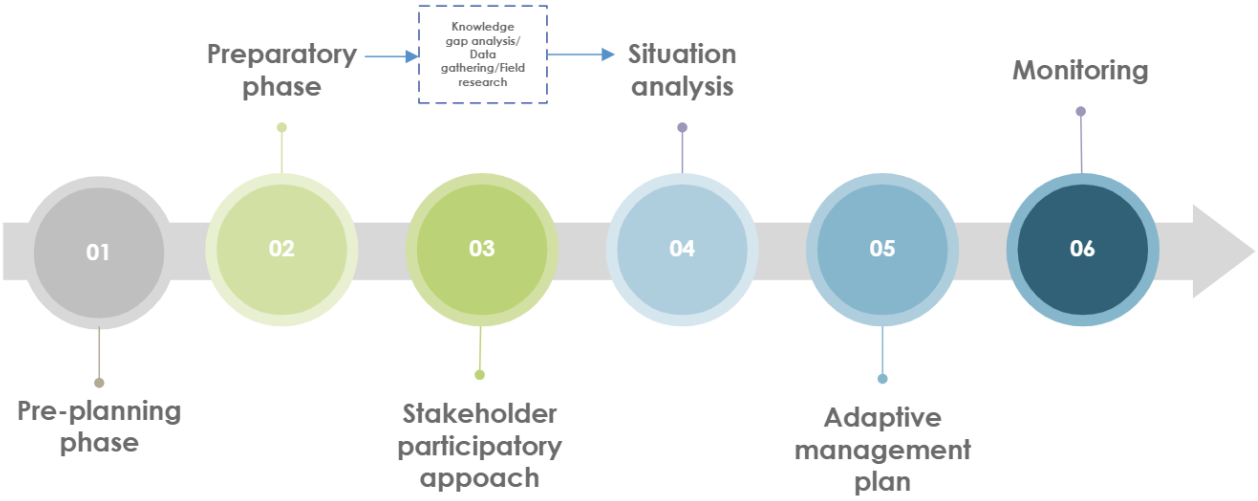
Regarding avifauna, the presented analysis was conducted by Balyan Luba and her team who did bird surveys in the northern regions of Armenia including the Ijevan area for the power line preassessment project. They covered both breeding and nonbreeding periods. Field visits took place over three consecutive years 2021, 2022, 2023: late May, mid-June, early September for higher elevations and mid-April and mid-October for lower elevations because higher elevations are less accessible in that period because of the inclement weather. For habitats and plant species, no new data (since the Standard Data Form [SDF] 2016) are presented in the current MP, apart from the presence of target plants such as *Echium russicum* in the project area.

Information was also provided by the SDF[6] (Annex C) of the site and the two active FE MPs (Sevkar FE and Ijevan FE) in the area and other files, for example, sanctuary plans. Also, information has been confirmed by other scientific members (for example, ornithological community) and locals (for example, local Environmental Inspectorate and reports by local caretakers). Regarding the SDF, there are a few changes in the species/habitat lists by the revised proposal (2023-2024 under the EU4Environment Program recommendations). It should be emphasized that regular monitoring is a necessity and included in the Action Plan.

Currently, the MP development is the scientific community's responsibility under the supervision of MoE and the World Bank. Since the Emerald site Ijevan overlaps with an FE, the State Noncommercial Organization (SNCO) (SNCO Ijevan and Sevkar) was included as a key stakeholder. Also, a new law regarding Eco Patrol[7] is active, but its functions are not active yet.

[5] D2: Recommendations for Guidelines for Preparing Management Plans of Emerald Sites in Armenia (2023), EU4Environment Program.
[6] SDF Ijevan, https://natura2000.eea.europa.eu/Emerald/SDF.aspx?site=AM0000005
[7] https://www.arlis.am/DocumentView.aspx?DocID=186692

Figure 1. Process phases for the development of the current MP

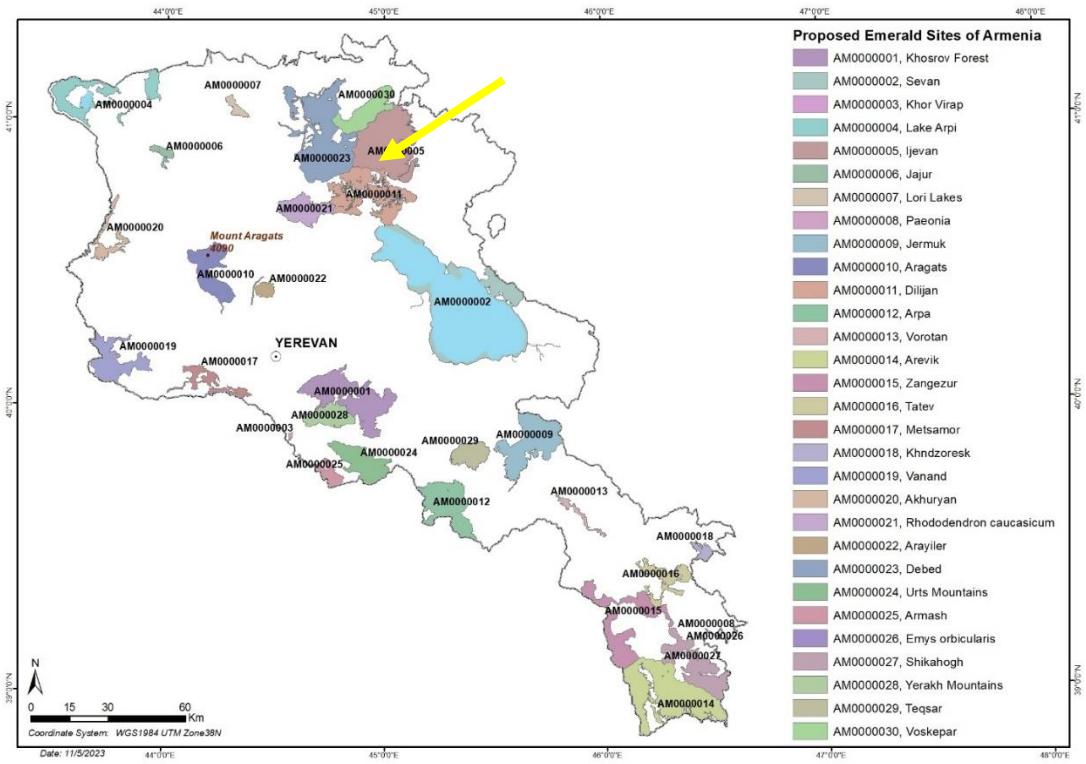


Source: Developed by kartECO for the World Bank

Conservation protection history[8]

The Emerald site 'Ijevan' (AM0000005) is in Northeast Armenia in Tavush marz (Figure 2). Part of the site shares common boundaries with AM0000030 '*Voskepar'* in the north, AM0000023 '*Debed gorge'* in the east, and Dilijan National Park (AM0000011 'Dilijan') in the south. The Emerald site was initially proposed in 2013. It was part of the Emerald Site AM0000010 'Dilijan National Park, Ijevan State Sanctuary' with an area of 9,641.05 ha (Ijevan branch of the site), covering approximately 20 percent of the current Emerald site Ijevan 2023-2024.

Figure 2. Emerald sites of Armenia (proposed in 2023)



Note: Emerald site 'Ijevan' (AM0000005) location pointed with yellow arrow.
Source: Developed by kartECO for the World Bank

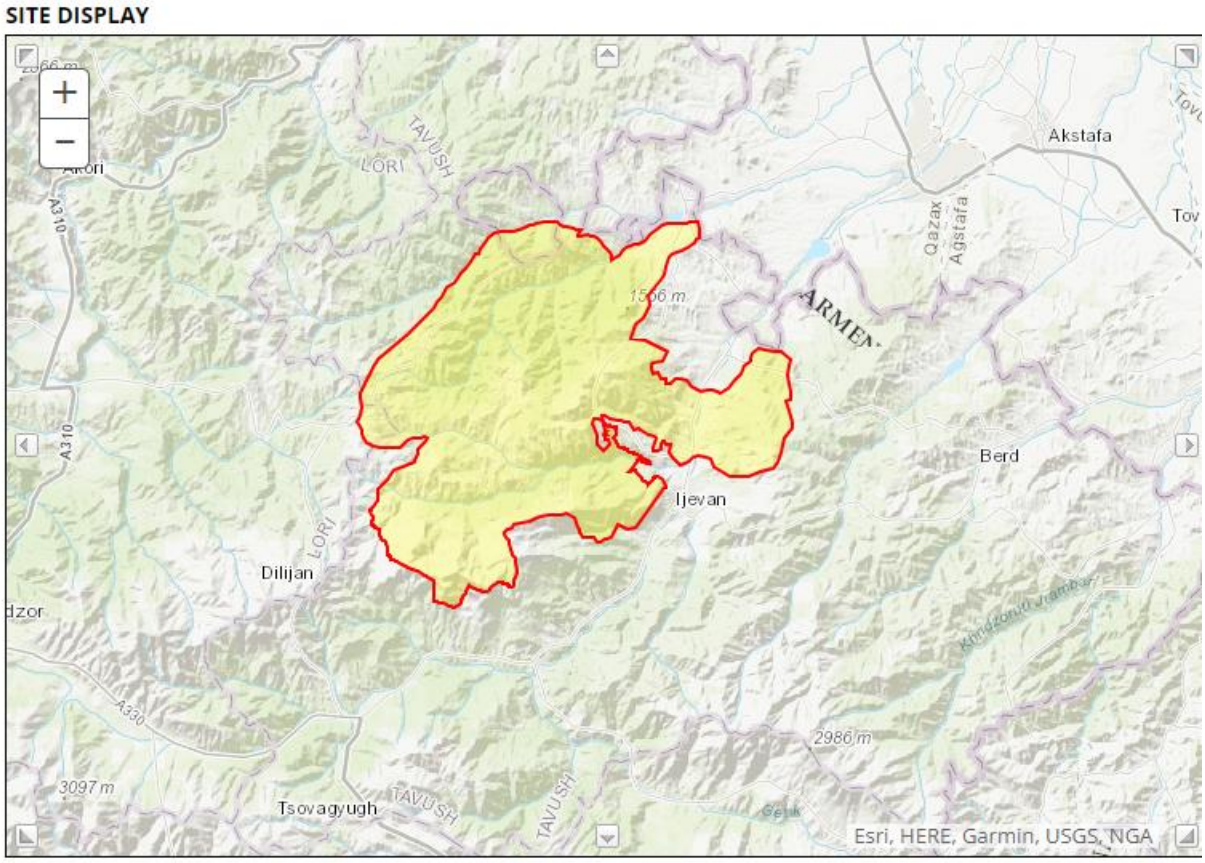
[8] http://env.am/en/environment/sanctuaries

The first complete submission - to Bern Convention - of the Ijevan site was in 2016 when the site was expanded and occupied 47,593.1 ha. It merged two former sites: 'Ijevan' and 'Lasti Ver'. Within 'Ijevan' and 'Hazelnut' State Sanctuaries 40 species from Resolution 6 of the Convention are present together with many other flora and fauna of national importance. The 2016 site information was included in an SDF[9] (see Annex C) with a respective shapefile with the site boundaries (Figure 3) (a complete set of maps is included in Annex A).

Since 2016 and according to the Emerald Barometer information,[10] the site (as with all Emerald sites in Armenia) is characterized as a '*candidate*' site, that is, it has not yet been '*adopted*'. This means that there is a relatively long-time gap in the Emerald Network process without any progress.

In 2023-2024 - based on the EU4Environment Program recommendations - a small expansion in the site area (+4 percent) and boundary optimization (with 75.6 percent of the Emerald site area remaining the same) were implemented. The expansion was made to include the meadow habitats - apart from the forests. This expansion will contribute to a more holistic and multifunctional forest and pasture management in the future. Also new bird species were added, including Aegypius monachus (regular visitor in the site), Aquila nipalensis, Circus macrourus, and Falco naumanni (regular spring/autumn passage).

Figure 3. Emerald site 'Ijevan' (AM0000005) boundaries



Source: SDF 2016.

Based on the above information, Table 1 summarizes the overall protection history of the Emerald site Ijevan is presented.

[9] SDF Ijevan, https://natura2000.eea.europa.eu/Emerald/SDF.aspx?site=AM0000005
[10] Emerald Barometer, https://tableau-public.discomap.eea.europa.eu/views/EmeraldBarometerdashboard/Barometertable?%3AshowAppBanner=false&%3Adisplay_count=n&%3AshowVizHome=n&%3Aorigin=viz_share_link&%3AisGuestRedirectFromVizportal=y&%3Aembed=y

Table 1. Protection history of the Emerald site Ijevan since 2011

Year	Area (ha)	Comment
2011	—	—
2013	9,641	Part of AM0000010 - 'Dilijan National Park, Ijevan State Sanctuary'
2016	47,593	
2023	49,499	Area increase of 3.8%
		37,446 ha overlap with 2016 boundaries

Current conservation, protection, and management framework

The current framework applied in the project area is presented below.

Emerald site conservation measures mentioned in SDF 2016

SDF 2016[11] that covers most of the current Emerald site Ijevan (that is, almost 75.6 percent) has no information and recommendations on conservation management activities. In addition, there are a few changes in the species lists by the revised proposal (2023-2024 under the EU4Environment Program recommendations).

Site conservation and management framework under Armenia legislation (for example, designated protected areas and FEs)

Part of the study site (Figure 4) overlaps with two FEs, that is, Sevkar FE and Ijevan FE, and with two sanctuaries, that is, Arjatkhleni - Hazelnut and Ijevan State Sanctuary. The total overlap part of the project area within the designated protected areas (that is, SNPA, sanctuaries, and others under Armenia legislation) and FEs accounts for 62.2 percent (Table 2), the rest (37.8 percent) being non-protected community grasslands (white areas in the map - Figure 4).

Table 2. Protection and management scheme proportion in the project area (in Ha)

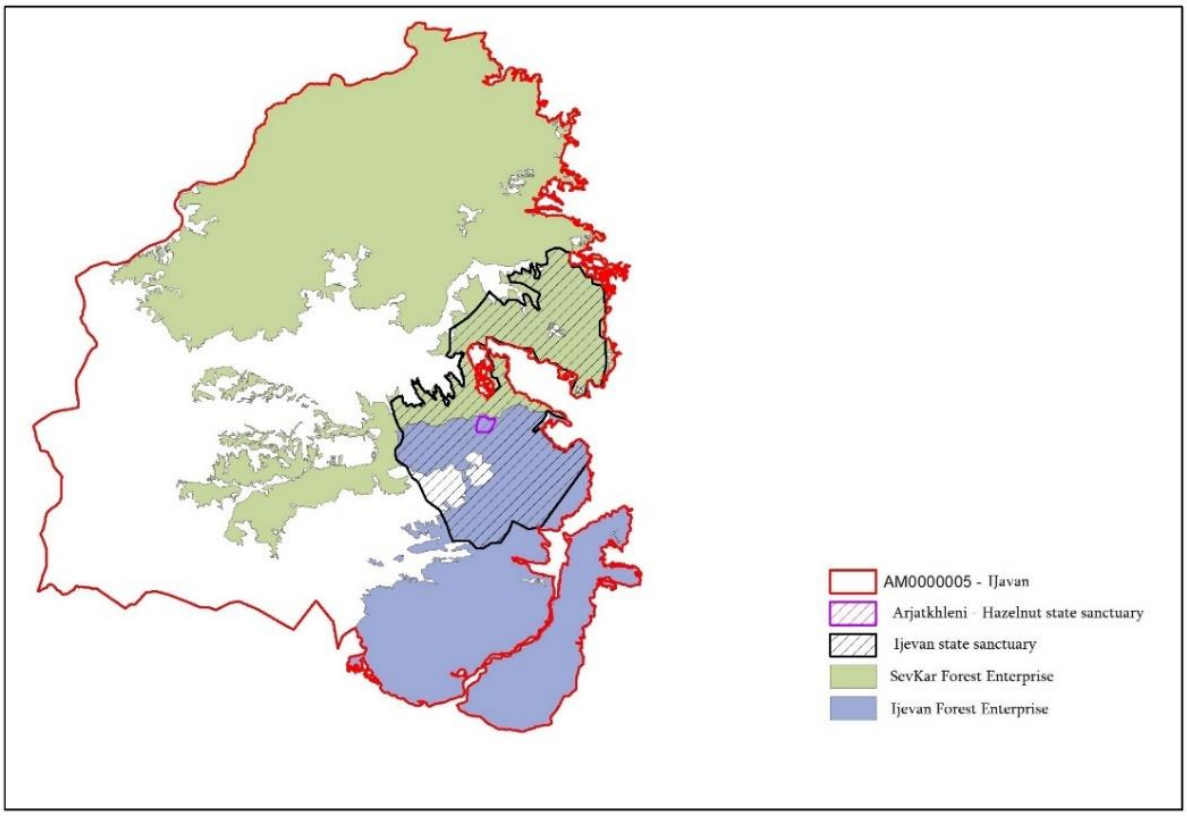
Emerald site conservation and management framework		Area (Ha)	% of site
Designated protected areas under Armenia legislation	Sanctuaries	6,110	12.3
	Others such as State Reserves, National Parks	0	0
FEs		29,555	62.18
Total Emerald site overlap with designated protected areas and FEs		30,778.47	62.18
Community lands		18,720.53	37.82
Emerald site of Ijevan - AM0000005 (2023–2024)		49,499	100

Sanctuaries

Both Arjatkhleni - Hazelnut and Ijevan State Sanctuary are located within the Emerald site Ijevan Figure 4). Together, they cover approximately 12.3 percent of the area of the Emerald site Ijevan. The Arjatkhleni - Hazelnut Sanctuary was established in 1958[12] for the preservation of hazelnut and yew groves. The Ijevan State Sanctuary was established in 1971[13] for the protection of forest landscapes and some species of animals (deer, bear, pheasant). Until now, no other special measures for nature protection have been applied in the project area. The governing organization for the sanctuaries was 'ArmForest' SNCO. Currently, there is no change regarding the governing body, although a reformation is taking place.

[11] SDF Ijevan, https://natura2000.eea.europa.eu/Emerald/SDF.aspx?site=AM0000005
[12] N P-341 decree of ArmSSR Council of Ministers.
[13] N 212 directive of ArmSSR Council of Ministers.

Figure 4. Map depicting designated protected areas and FEs within the project area



Note: White areas are non-protected community grasslands within the Emerald site.

Source: Developed by kartECO for the World Bank.

Other protected areas in the vicinity of the project area

Inside and in the vicinity of the Emerald site Ijevan are three protected areas under international agreements (but not legislated in Armenia): Important Bird Areas (IBA), Key Biodiversity Areas (KBA), and Important Plant Areas (IPA) (Table 3).

Table 3. Other types of protected areas (not governmentally protected in Armenia) in the vicinity of the Emerald site Ijevan

Other types of protected areas (not governmentally protected in Armenia)	Name	Completely within/ partial overlap with the Emerald site Ijevan
IPA	Ijevan Hazel Grove	The IPA fully coincides with the Arjatkhleni Hazelnut Sanctuary. (https://www.plantlifeipa.org/site/factsheet/1967)
KBA	Dsegh - Haghartsin - Pombak chain and Dilijan National Park	Partial overlap (https://www.keybiodiversityareas.org/site/factsheet/26263)
IBA	Haghartsin	Partial overlap (https://datazone.birdlife.org/site/factsheet/haghartsin-iba-armenia)

Finally, Table 4 presents the designated protected areas under Armenia legislation and FEs near the project area. The fact that adjacent to the site there are seven areas under a protection and management scheme along with a number of 'other protected areas' indicates the importance of the area and the surroundings. This could further be explored in the future, for example, as a potential eco-corridor or in joining Emeralds.

Table 4. Areas with special status of conservation in vicinity of the Emerald site Ijevan

Areas with special status of conservation	Name	Distance to Emerald site Ijevan
Designated protected areas	Arjatkhleni Hazelnut Sanctuary	100% inside the site
	Ijevan State Sanctuary	100% inside the site
	Dilijan Sanctuary/National Park	Adjacent to the south boundary of the site
	Gandzakar - Upper Sanctuary	Adjacent to the southeast boundary of the site
Other Emerald sites	Voskepar - AM0000030	Adjacent to the northwest boundary of the site
	Debed - AM0000023	Adjacent to the southwest boundary of the site
	Dilijan - AM0000011	Adjacent to the south boundary of the site
FEs	Sevkar	42.43% of the site located in Sevkar FE
	Ijevan	19.75% of the site located in Ijevan FE
	Dsegh	Adjacent to the southwest boundary of the site
	Noyemberyan	Adjacent to the northwest boundary of the site

FE management framework

About 62.18 percent of the project area is in two different FEs: the Sevkar FE (42.43 percent of the Emerald site) and the Ijevan FE (19.75 percent of the Emerald site).

The last Sevkar forest management plan (FMP) was prepared in 2021 and is active until 2030. The last Ijevan FMP was prepared in 2021 and is active until 2030.

This study also used these two MPs as a source of data and information, provides a brief outline of the proposed FMP measures, assesses their compliance with the proposed Emerald conservation objectives, and proposes several corrective measures to be considered.

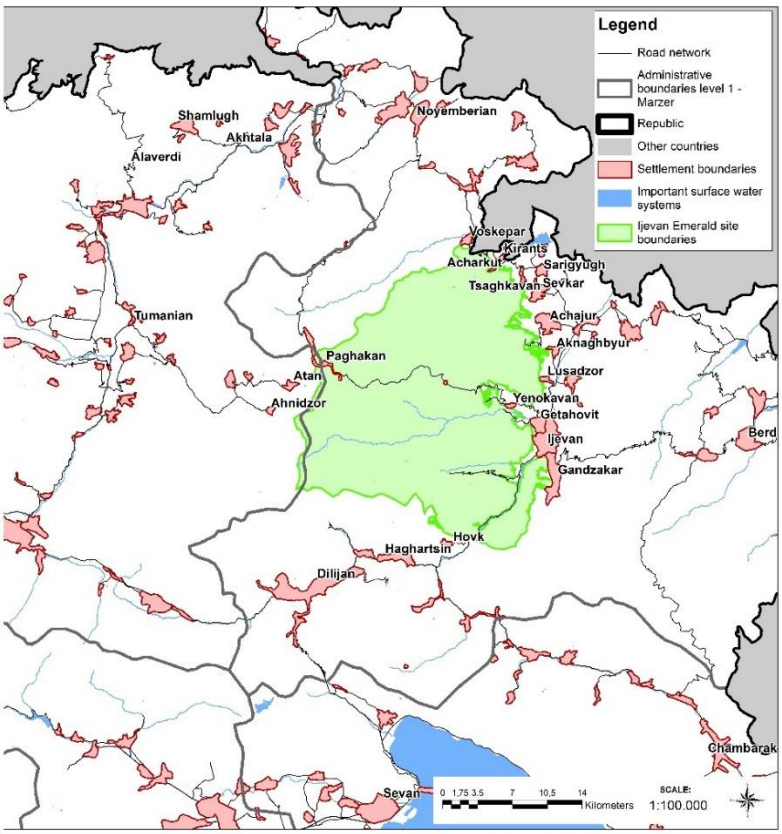
Description of the Emerald Site

Emerald site

The Emerald site Ijevan is located entirely within the marz (province) of Tavush, the northeasternmost province of Armenia. The nearest towns are Ijevan, which is on the east boundary of the Emerald site (the city limits are the boundaries of the Emerald Site of Ijevan) with a population of 21,081, and Dilijan, which is approximately 10 km south from the Emerald site with a population of 17,712. The site is approximately 150 km from Yerevan.

Close to the Emerald site, a number of settlements are found (Figure 5) such as Hovk in the south; Ahnidzor, Atan and Paghakan in the west; Voskepar, Kirants, Acharkut, Tsaghkavan, and Sevkar in the north; and Achajur, Lusadzor, Yenokavan, Getahovit, Ijevan, and Gandzakar in the east.

Figure 5. Administrative divisions and communities in the vicinity of the Emerald site Ijevan



Source: Developed by kartECO for the World Bank

In the north, east, and southeast, the site borders Ijevan and Sevkar FEs. The southeast boundaries follow the national road network and Aghstev river course. The south and southwestern boundaries follow the Dimats Mountain ridge. Finally, the western boundary of the site follows the administrative boundary line of the Tavush and Tumanyan marz.

Table 5. General information of the Emerald site Ijevan - AM0000005

Geographical position		
Coordinates of center (meters)	X	500,799
	Y	4,529,630
Perimeter (meters)	280,705.10	
Area (ha)	49,499.42	
Administrative affiliation		
Province (marz)	Tavush (100%)	
Regional unit	Ijevan (100%)	

Land use, including the current status and ownership, and factors affecting the protected object(s) (abiotic, biological, human activities)

Land uses and factors affecting the protected object(s) (abiotic, biological, human activities)

The following two main categories of land use make up 99 percent of the project area:

- Tree cover/forest areas, which cover the major part of the project area (62.2 percent), completely distributed between two FEs (Sevkar and Ijevan FEs) and
- Grasslands (37.8 percent), which cover the entire site area community lands and are used mainly as pastures and hayfields.

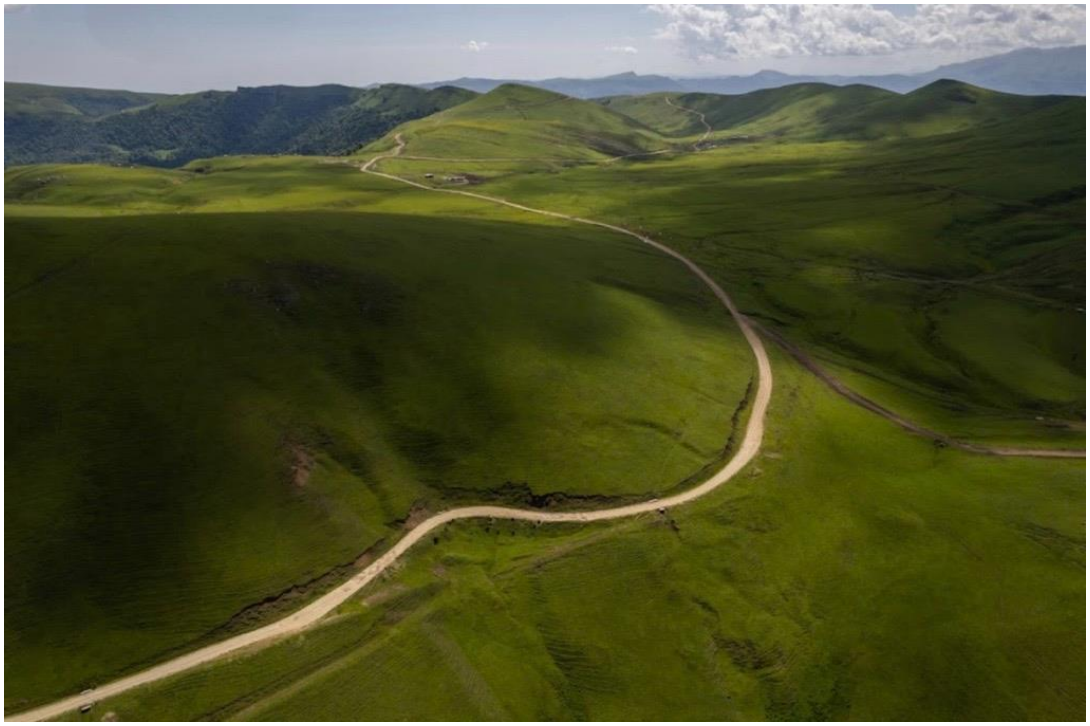
Table 6. Land use in the Emerald site Ijevan - AM0000005[14]

Land type	Area (ha)	Percentage of the site
Tree cover/forest areas	29,555	59.7
Grassland	19,907	40.2
Cropland	31	<0.1
Built-up	5	<0.1
Bare/sparse vegetation/Shrubland	1	<0.1
Permanent water bodies	0.42	<0.1
Total area of site	49,499.42	100

There is no major cropland area. All small, cultivated lands are fragmented and distributed mainly near rural residence houses. The built-up area is mainly found in the vicinity of the settlement Yenokavan, on the east boundary of the Emerald site. The site has no settlements and very few buildings or other permanent structures. Also, there are no other significant operations, for example, industrial or other relevant operations.

Photographic samples of representative land cover types in the project area - namely, grasslands, mixed grasslands/forests, and forest/riparian areas - can be seen in Figures 6, 7, and 8 respectively.

Figure 6. Administrative divisions and communities in the vicinity of the Emerald site Ijevan



Source: Shant Khatcherian, Google Maps

[14] Data source for the land use file: © ESA WorldCover project (2021)/Contains modified Copernicus Sentinel data processed by ESA WorldCover consortium.

Figure 7. View of land cover change from grasslands to forest

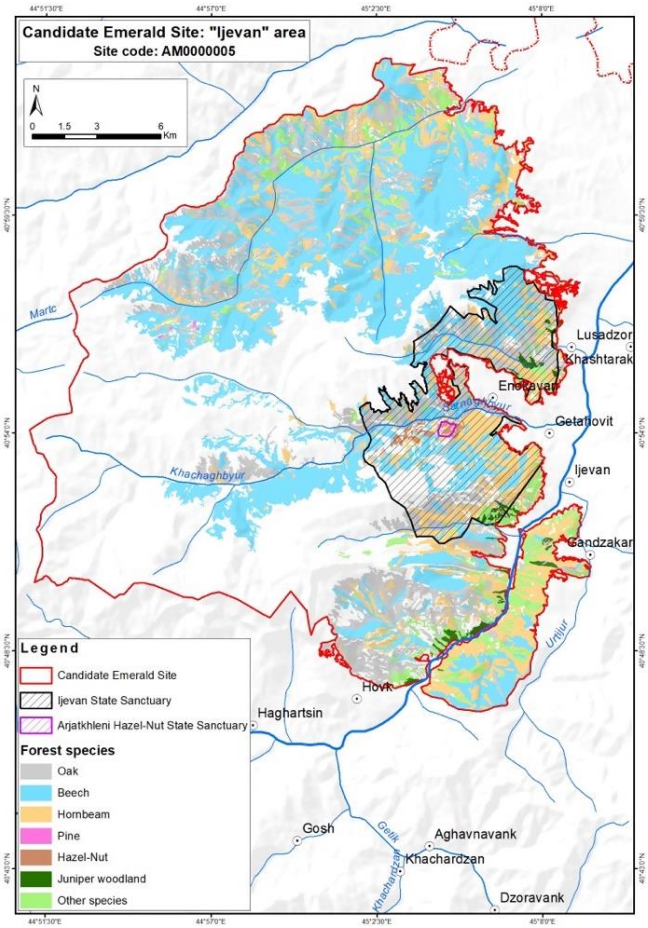
Source: Shant Khatcherian, Google Maps

Figure 8. View of the riparian environment of Aghstev River with forested banks

Source: Shant Khatcherian, Google Maps

A map of the tree cover type within the forest area of the Emerald site is presented below (Figure 9). Beech is the predominant cover type.

Figure 9. Tree cover type of the Emerald site Ijevan - AM0000005



Source: MoE.

The higher elevation area in the southwest of the project area mostly comprises heathland and grassland, mainly owned by the state and used as pastures and hayfields.

Regarding utilities in the project area, the main road network of national importance, 'U-4', which connects Ijevan and Yerevan, passes through the Emerald site at its southeastern corner. A secondary road network ('Ъ-26'), of local importance, also passes through the site.

The state non-profit organization 'HAYANTAR' (SNPO) is engaged in timber harvesting, processing, and sales with facilities close to (within or near) the Emerald site. The organization carries out afforestation and reforestation.

Protected object(s) (Resolution 4 and 6)

This part presents all the key elements within the project area that are essential for the protection and preservation of the species and natural habitats listed in Resolutions No. 4 (1996) and No. 6 (1998) and present on the site.

Conservation degree calculation methodology per target habitat type and species

Based on the international practice followed within the EU for Natura 2000 site management, a conservation degree methodology was developed and followed for the study needs and country experts' capacities. The conservation degree is calculated by combining the methodology proposed by Evans and Arvela (2011)[15] and the explanatory notes used for completing SDFs (European Commission 2011).[16] A brief description of the

[15] Evans, D., and M. Arvela. 2011. *Assessment and Reporting under Article 17 of the Habitats Directive: Explanatory Notes & Guidelines for the Period 2007–2012 - Final Draft.* European Topic Centre on Biological Diversity. 1–123.
[16] European Commission. 2011. *NATURA 2000 Standard Data Form Explanatory Notes*. https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2011:198:0039:0070:EN:PDF

methodology is presented below. It was explained in detail in the capacity-building seminar session organized as part of the EU4Environment Program.

Step 1

The analysis starts by assessing (with A, B, and C values) seven important conservation criteria per feature, that is, structure and functions (1), typical species (2), area cover (3), pressures (P) and threats (T) (4), positive impacts (5), future trend (6 = 4 + 5), and future status (7 = 1).

Structure and Functions (1)	Typical species (2)[17]	Area cover (3)[18]	Pressures (P) & Threats (T) (4)[19]	Positive impacts (5)	Future trend (6 = 4 + 5)	Future status (7 = 1)

As already mentioned, possible conservation criteria values given are the following:

A: Excellent (A)

B: Good (B)

C: Moderate or limited (C)

Step 2

Based on the values, that is, with A, B, and C assigned to each of the eight criteria in Step 1, three **combined** results (groups), that is, Group A/Final evaluation of structures and functions, Group B/Conservation prospects, and Group C/Restoration possibility, are also calculated with the following calculation relations.

Structure and Functions (1)	Typical species (2)[20]	Final evaluation of structures and functions (Group A = 1+2)	Area cover (3)[21]	Pressures (P) & Threats (T) (4)[22]	Positive impacts (5)	Future trend (6 = 4+5)	Future status (7 = 1)	Conservation prospects (Group B = 3+6+7)	Restoration possibility (Group C)[23]

Possible group values are the following:

A: Excellent

B: Good

C: Moderate or limited

Step 3: Final assessment for each target feature (species and/or habitats)

Based on Group A, Group B, and Group C values calculated in Step 2, the final and overall conservation degree of the habitat type or species, that is, 'Conservation degree (Group A, B, C)', is finally calculated.

Structure and Functions (1)	Typical species (2)[24]	Final evaluation of structures and functions (Group A = 1+2)	Area cover (3)[25]	Pressures (P) & Threats (T) (4)[26]	Positive impacts (5)	Future trend (6 = 4+5)	Future status (7 = 1)	Conservation prospects (Group B = 3+6+7)	Restoration possibility (Group C)[27]	Conservation degree (Group A, B, C)[28]

[17] Assess the dominance of typical species of the habitat type.
[18] Assess whether reference values (of distribution area) are satisfactory.
[19] A: No P or T of high importance and up to 1 of medium importance, B: Up to 3 P or T of medium importance, C: At least 1 T or P of high importance and/or more than 3 P or T of medium importance.
[20] Assess the dominance of typical species of the habitat type.
[21] Assess whether reference values (of the distribution area) are satisfactory.
[22] A: No P or T of high importance and up to 1 of medium importance, B: Up to 3 P or T of medium importance, C: At least 1 T or P of high importance and/or more than 3 P or T of medium importance.
[23] A = easy, B = possible with an average effort, C = difficult or impossible.
[24] Assess the dominance of typical species of the habitat type.
[25] Assess whether reference values (of the distribution area) are satisfactory.
[26] A: No P or T of high importance and up to 1 of medium importance, B: Up to 3 P or T of medium importance, C: At least 1 T or P of high importance and/or more than 3 P or T of medium importance.
[27] A = easy, B = possible with an average effort, C = difficult or impossible.
[28] Conservation degree = A (excellent conservation), B (good conservation), C (moderate or limited conservation, A/B (conservation degree is a result of expert judgment and needs to be evaluated with field data).

The overall conservation degree (per target species and/or habitats), that is, 'Conservation degree (Group A, B, C)', may take the following values:

Conservation degree = A (excellent conservation)	Conservation degree = B (good conservation)	Conservation degree = C (moderate or limited conservation)
If a percentage greater than, or equal to, 75% of the area has an excellent conservation status	If the percentage having an excellent degree of conservation is less than 75% and the percentage of moderate conservation degree is less than 25%	If a percentage greater than, or equal to, 25% has moderate degree of conservation

A combined/new category added is as follows:

Conservation degree = A/B
In case the conservation degree **is a result of expert judgment and needs to be further evaluated with field data**

A calculation example is the following (Group A = A, Group B = B, Group C = A, and thus conservation degree = A):

Habitat type or species type	Structure and functions (1)	Typical species (2)[29]	Final evaluation of structures and functions (Group A = 1+2)	Area cover (3)[30]	Pressures (P) and threats (T) (4)[31]	Positive impacts (5)	Future trend (6 = 4+5)	Future status (7 = 1)	Conservation prospects (Group B = 3+6+7)	Restoration possibility (Group C)[32]	Conservation degree (Group A, B, C)[33]
XXXXX	A	—	**A**	A	B	—	B	B	**B**	**A**	**A**

The goal of the above method is to calculate the conservation degree of the sampling plots within each cell and the conservation degree of the habitat type or species for each cell during sampling.

It must be emphasized that in the project area no systematic sampling has been done for the habitat types and for the species, and therefore, the calculation of the conservation degree was estimated by the experts based on bibliographical data and observations. The habitat mapping was done based exclusively on experts' assessments and satellite mapping and without field observations.

When the final habitat types or species have a conservation degree of A/B, B, or C, then the pressures and threats should be further analyzed, and management measures must be proposed for the particular habitats/species.

Natural habitat types

The number of habitats included in Resolution 4 is 27 and their conservation degree is calculated and presented below (Table 7). According to the analysis, 6 out of 27 are characterized as 'A' (excellent conservation), 1 out of 27 as 'B' (good conservation), and the majority, 20 out of 27, as A/B (Table 8).

The biodiversity information was collected and provided by G. Fayvush and A. Aleksanyan based on personal field investigations and the monograph 'Habitats of Armenia' (Fayvush and Aleksanyan 2016). It should be emphasized that some data on distribution and areas of some habitats are missing. Thus, there is a need for monitoring and update information through fieldwork.

[29] Assess the dominance of typical species of the habitat type.
[30] Assess whether reference values (of the distribution area) are satisfactory.
[31] A: No P or T of high importance and up to 1 of medium importance, B: Up to 3 P or T of medium importance, C: At least 1 T or P of high importance and/or more than 3 P or T of medium importance.
[32] A = easy, B = possible with an average effort, C = difficult or impossible.
[33] Conservation degree = A (excellent conservation), B (good conservation), C (moderate or limited conservation, A/B (conservation degree is a result of expert judgment and needs to be evaluated with field data).

Table 7. Conservation degree analysis of habitats in the project area (27 types)

Habitat type	Structure and functions (1)	Typical species (2)[34]	Final evaluation of structures and functions (Group A = 1+2)	Area cover (3)[35]	Pressures (P) & threats (T) (4)[36]	Positive impacts (5)	Future trend (6 = 4+5)	Future status (7 = 1)	Conservation prospects (Group B = 3+6+7)	Restoration possibility (Group C)[37]	Conservation degree (Group A, B, C)[38]
C2.26 Lime-rich oligotrophic vegetation of fast-flowing streams	A	A	**A**	A	B	—	B	A	**A**	**A**	**A/B**
C2.27 Mesotrophic vegetation of fast-flowing streams	A	A	**A**	A	B	—	B	A	**A**	**A**	**A/B**
C2.28 Eutrophic vegetation of fast-flowing streams	A	A	**A**	A	B	—	B	A	**A**	**A**	**A/B**
C3.4 Species-poor beds of low-growing water-fringing or amphibious vegetation	A	A	**A**	A	B	—	B	A	**A**	**A**	**A/B**
C3.55 Sparsely vegetated river gravel banks	A	A	**A**	A	B	—	B	A	**A**	**A**	**A/B**
C3.62 Unvegetated river gravel banks	A	A	**A**	A	B	—	B	A	**A**	**A**	**A/B**
D5.2 Beds of large sedges normally without free-standing water	A	A	**A**	A	A	—	A	A	**A**	**A**	**A**
E1.2 Perennial calcareous grassland and basic steppes	A	A	**A**	A	C	—	C	B	**B**	**A**	**A/B**
E1.3 Mediterranean xeric grassland	A	A	**A**	A	C	—	C	B	**B**	**A**	**A/B**
E2.3 Mountain hay meadows	A	A	**A**	A	C	—	C	B	**B**	**A**	**A/B**
E3.4 Moist or wet eutrophic and mesotrophic grassland	A	A	**A**	A	C	—	C	B	**B**	**A**	**A/B**
E5.4 Moist or wet tall-herb and fern fringes and meadows	A	A	**A**	A	C	—	C	B	**B**	**A**	**A/B**
E5.5 Subalpine moist or wet tall-herb and fern stands	A	A	**A**	A	C	—	C	B	**B**	**A**	**A/B**
F3.245 Eastern Mediterranean deciduous thickets	A	A	**A**	A	A	—	A	A	**A**	**A**	**A**
F3.247 Ponto-Sarmatic deciduous thickets	A	A	**A**	A	A	—	A	A	**A**	**A**	**A**
F5.13 Juniper matorral	A	A	**A**	A	A	—	A	A	**A**	**A**	**A**
F7 Spiny Mediterranean heaths	A	A	**A**	A	B	—	B	A	**A**	**A**	**A/B**
F9.1 Riverine scrub	A	A	**A**	A	B	—	B	A	**A**	**A**	**A/B**

[34] Assess the dominance of typical species of the habitat type.
[35] Assess whether reference values (of the distribution area) are satisfactory.
[36] A: No P or T of high importance and up to 1 of medium importance, B: Up to 3 P or T of medium importance, C: At least 1 T or P of high importance and/or more than 3 P or T of medium importance.
[37] A = easy, B = possible with an average effort, C = difficult or impossible.
[38] Conservation degree = A (excellent conservation), B (good conservation), C (moderate or limited conservation, A/B (conservation degree is a result of expert judgment and needs to be evaluated with field data).

Habitat type	Structure and functions (1)	Typical species (2)[34]	Final evaluation of structures and functions (Group A = 1+2)	Area cover (3)[35]	Pressures (P) & threats (T) (4)[36]	Positive impacts (5)	Future trend (6 = 4+5)	Future status (7 = 1)	Conservation prospects (Group B = 3+6+7)	Restoration possibility (Group C)[37]	Conservation degree (Group A, B, C)[38]
G1.11 Riverine willow woodland	A	A	**A**	A	C	—	C	B	**B**	**A**	**A/B**
G1.22 Mixed oak - elm - ash woodland of great rivers	A	A	**A**	A	C	—	C	B	**B**	**A**	**A/B**
G1.6 Beech woodland	A	A	**A**	A	C	—	C	B	**B**	**A**	**A/B**
G1.A1 Oak-ash-hornbeam woodland on eutrophic and mesotrophic soils	A	A	**A**	A	C	—	C	B	**B**	**A**	**A/B**
G1.A7 Mixed deciduous woodland of the Black and Caspian Seas	A	A	**A**	A	C	—	C	B	**B**	**A**	**A/B**
G3.9 Coniferous woodland dominated by Cupressaceae or Taxaceae	A	A	**A**	A	B	—	B	A	**A**	**A**	**A/B**
H1 Caves	A	-	**A**	A	C	—	C	B	**B**	**B**	**B**
H2.4 Temperate-montane calcareous and ultra-basic screes	A	A	**A**	A	A	—	A	A	**A**	**A**	**A**
H3.2 Basic and ultra-basic inland cliffs	A	A	**A**	A	A	—	A	A	**A**	**A**	**A**

Table 8. Conservation degree results for habitats in the project area (27 types)

Conservation degree = A (excellent conservation)	Conservation degree = B (good conservation)	Conservation degree = A/B (if the conservation degree is a result of expert judgment and needs to be further evaluated with field data)	Conservation degree = C (moderate or limited conservation)
6	1	20	0

A view of the current condition of several habitats is illustrated in Figure 10. Most of the habitats have an excellent conservation degree and status.

Figure 10. Photo of habitats in the project area

C3.35 Sparsely vegetated river gravel banks

E3.4 Moist or wet eutrophic and mesotrophic grassland

F3.247 Ponto-Sarmatic deciduous thickets

F7 Spiny Mediterranean heaths

G1.A7 Mixed deciduous woodland of the Black and Caspian Seas

H3.2 Basic and ultra-basic inland cliffs

Source: George Fayvush

Species

Plants

The number of plants in the project area included in Resolution 6 is two and their conservation degree is calculated and presented in Tables 9 and 10. According to the analysis, one out of two species is classified as ‘A’ excellent conservation and the other as ‘A/B’.

The biodiversity information was collected and provided by G. Fayvush based on personal fieldworks, the multivolume edition of ‘Flora of Armenia’ (Takhtajan, 1954-2009), and the herbarium data from the Institute of Botany after A. Takhtadjyan NAS RA (ERE). It should be emphasized that data on *Steveniella satyrioides* are incomplete and monitoring is needed.

Table 9. Conservation degree analysis of target plants in the project area (2 species)

Species	Population (1)[39]	Habitat (2)[40]	Final evaluation of habitat and population (Group A = 1+2)	Area cover (3)[41]	Pressures & Threats (4)[42]	Positive impacts (5)	Future trend (6 = 4+5)	Future status (7 = 1)	Conservation prospects (Group B = 3+6+7)	Restoration possibility (Group C)[43]	Conservation degree (Group A, B, C)[44]
Echium russicum	A	A	**A**	A	B	—	B	A	**A**	**A**	**A/B**
Steveniella satyrioides	C	B	**C**	B	B	—	B	B	**B**	**B**	**B**

[39] Assess whether reference values are satisfactory.
[40] Assess the conservation degree of the species habitat.
[41] Assess whether reference values (of the distribution area) are satisfactory.
[42] A: No P or T of high importance and up to 1 of medium importance, B: Up to 3 P or T of medium importance, C: At least 1 T or P of high importance and/or more than 3 P or T of medium importance.
[43] A = easy, B = possible with an average effort, C = difficult or impossible.
[44] Conservation degree = A (excellent conservation), B (good conservation), C (moderate or limited conservation, A/B (conservation degree is a result of expert judgment and needs to be evaluated with field data).

Table 10. Conservation degree results for target plants in the project area (2 species)

Conservation degree = A (excellent conservation)	Conservation degree = B (good conservation)	Conservation degree = A/B (if the conservation degree is a result of expert judgment and needs to be further evaluated with field data)	Conservation degree = C (moderate or limited conservation)
1	0	1	0

Figure 11. Photo of target plants in the project area

Echium russicum

Steveniella satyrioides

Source: George Fayvush

Invertebrates

The number of invertebrates in the project area included in Resolution 6 is four, and their conservation status is detailed in Tables 11 and 12. According to the analysis, one of the four species is classified as 'A/B,' two as 'B,' and no conservation status is assessed for Phengaris nausithous (*Maculinea nausithous*) due to a lack of available information. Thus, for all the species, there is a necessity for monitoring and controlling populations. The biodiversity information used was collected and provided by Mark Kalashyan.

It should also be emphasized that further analysis of Phengaris nausithous (Maculinea nausithous) is proposed in the Action Plan.

Table 11. Conservation degree analysis of target Invertebrates in the project area (4 species)

Species	Population (1)[45]	Habitat (2)[46]	Final evaluation of habitat and population (Group A = 1+2)	Area cover (3)[47]	Pressures & Threats (4)[48]	Positive impacts (5)	Future trend (6 = 4+5)	Future status (7 = 1)	Conservation prospects (Group B = 3+6+7)	Restoration possibility (Group C)[49]	Conservation degree (Group A, B, C)[50]
Callimorpha (Euplagia) quadripunctaria	A	A	**A**	A	B	—	B	A	**A**	**A**	**A/B**
Rosalia alpina	C	B	**C**	B	B	—	B	B	**B**	**B**	**B**
Cerambyx cerdo	C	B	**C**	B	B	—	B	B	**B**	**B**	**B**
Phengaris nausithous (Maculinea nausithous)	No information	No information	No information	No information	No information	No information	No information	No information	No information	No information	No information

[45] Assess whether reference values are satisfactory.
[46] Assess the conservation degree of the species habitat.
[47] Assess whether reference values (of the distribution area) are satisfactory.
[48] A: No P or T of high importance and up to 1 of medium importance, B: Up to 3 P or T of medium importance, C: At least 1 T or P of high importance and/or more than 3 P or T of medium importance
[49] A = easy, B = possible with an average effort, C = difficult or impossible
[50] Conservation degree = A (excellent conservation), B (good conservation), C (moderate or limited conservation, A/B (conservation degree is a result of expert judgment and needs to be evaluated with field data).

Table 12. Conservation degree results for target Invertebrates in the project area (4 species)[51]

Conservation degree = A (excellent conservation)	Conservation degree = B (good conservation)	Conservation degree = A/B (if the conservation degree is a result of expert judgment and needs to be further evaluated with field data)	Conservation degree = C (moderate or limited conservation)
0	2	1	0

Figure 12. Photo of *Rosalia alpina* in the project area

Source: G. Karagyan

Reptiles

The number of reptiles in the project area included in Resolution 6 is two and their conservation degree is calculated and presented in Tables 13 and 14. According to the analysis, both the target species are classified as 'A' with excellent conservation. The biodiversity information used was collected and provided by Prof. M. Arakelyan during the previous Emerald Network review (2016).

[51] There is no information on Phengaris nausithous (Maculinea nausithous).

Table 13. Conservation degree analysis of target reptiles in the project area (2 species)

Species	Population (1)[52]	Habitat (2)[53]	Final evaluation of habitat and population (Group A = 1+2)	Area cover (3)[54]	Pressures & Threats (4)[55]	Positive impacts (5)	Future trend (6 = 4+5)	Future status (7 = 1)	Conservation prospects (Group B = 3+6+7)	Restoration possibility (Group C)[56]	Conservation degree (Group A, B, C)[57]
Emys orbicularis	A	A	**A**	A	A	—	A	A	**A**	**A**	**A**
Testudo graeca	A	A	**A**	A	A	—	A	A	**A**	**A**	**A**

[52] Assess whether reference values are satisfactory.
[53] Assess the conservation degree of the species habitat.
[54] Assess whether reference values (of distribution area) are satisfactory.
[55] A: No P or T of high importance and up to 1 of medium importance, B: Up to 3 P or T of medium importance, C: At least 1 T or P of high importance and/or more than 3 P or T of medium importance.
[56] A = easy, B = possible with an average effort, C = difficult or impossible.
[57] Conservation degree = A (excellent conservation), B (good conservation), C (moderate or limited conservation, A/B (conservation degree is a result of expert judgment and needs to be evaluated with field data).

Table 14. Conservation degree results for target reptiles in the project area (2 species)

Conservation degree = A (excellent conservation)	Conservation degree = B (good conservation)	Conservation degree = A/B (if the conservation degree is assigned the value of 'A/B', it is based on expert judgment and needs to be further evaluated with field data)	Conservation degree = C (moderate or limited conservation)
2	0	0	0

Figure 13. Photo of *Testudo graeca* in the project area

Source: Marine Arakelyan

Birds

The number of birds in the site area included in Resolution 6 is 28 and their conservation degree is calculated and presented in Table 15. According to the analysis, 13 out of 28 are classified as 'A' (excellent conservation), 3 as 'B' (good conservation), and 12 as 'A/B' (Table 16). Thus, it is especially important for a specific field monitoring program to be designed and implemented in the project area.

The biodiversity information used to assess the conservation objectives and pressures was collected and provided using the recent bibliographical record such as site management plans (Sevkar State Sanctuary Management Plan for 2021-2030 and Ijevan State Sanctuary Management Plan for 2017-2021) and expert observations.

Uncertainties in assessing the conservation degree of target migratory birds in the Emerald site, for example, black stork (Ciconia nigra) or others with high home range[58] potential, such as griffon vulture (Gyps fulvus), do not necessarily mean that the species will use all the space. In most cases - for example, black stork (Ciconia nigra), if resources are concentrated in specific areas, the stork may focus its activities in those areas and use only a fraction of the total range. Besides, during the breeding period, the black stork has limited movements and focuses its foraging activities efforts close to its nesting sites (black stork is a solitary nester, and there are only a few pairs of black storks in Armenia). Obviously, the Emerald site Ijevan can support only one breeding pair of the black stork (Ciconia nigra), and a part of its home range (in breeding season) will be out of the project area. Nevertheless, the nesting area is within the Emerald site. More importantly, the site's geography and habitat distribution provide the necessary nesting areas and most of the foraging areas.

[58] Area traversed for bird species normal activities such as food gathering, mating, and caring for young.

Table 15. Conservation degree analysis of target birds in the project area (28 species)

Species	Population (1)[59]	Habitat (2)[60]	Final evaluation of habitat and population (Group A = 1+2)	Area cover (3)[61]	Pressures & Threats (4)[62]	Positive impacts (5)	Future trend (6 = 4+5)	Future status (7 = 1)	Conservation prospects (Group B = 3+6+7)	Restoration possibility (Group C)[63]	Conservation degree (Group A, B, C)[64]
Aegypius monachus	A	A	**A**	A	A	—	A	A	**A**	**A**	**A**
Aquila chrysaetos	A	A	**A**	A	B	—	B	A	**A**	**A**	**A/B**
Aquila pomarina	A	A	**A**	A	B	—	B	A	**A**	**A**	**A/B**
Aquila nipalensis	A	A	**A**	A	B	—	B	A	**A**	**A**	**A**
Bubo bubo	A	A	**A**	A	A	—	A	A	**A**	**A**	**A**
Buteo rufinus	A	A	**A**	A	B	—	B	A	A	A	**A/B**
Caprimulgus europaeus	A	A	**A**	A	A	—	A	A	**A**	**A**	**A**
Ciconia nigra	A	A	**A**	A	A	—	A	A	**A**	**A**	**A**
Circaetus gallicus	A	A	**A**	B	A	—	A	A	**A**	**A**	**A**
Circus macrourus	A	A	**A**	B	A	—	A	A	**A**	**A**	**A**
Crex crex	A	A	**A**	A	B	—	A	A	**A**	**A**	**A**
Dendrocopos medius	A	A	**A**	A	B	—	B	A	**A**	**B**	**A/B**
Dryocopus martius	A	A	**A**	A	B	—	B	A	**A**	**B**	**A/B**
Emberiza hortulana	A	A	**A**	A	A	—	A	A	**A**	**A**	**A**
Falco naumanni	A	A	**A**	A	A	—	A	A	**A**	**A**	**A**
Falco peregrinus	A	A	**A**	A	B	—	B	A	**A**	**B**	**A/B**
Ficedula parva	A	A	**A**	A	B	—	B	A	**A**	**B**	**A/B**
Ficedula semitorquata	A	A	**A**	A	B	—	B	A	**A**	**B**	**A/B**
Gypaetus barbatus	A	A	**A**	A	C[65]	—	C	B	**B**	**B**	**B**
Gyps fulvus	A	A	**A**	A	C	—	C	B	**B**	**B**	**B**
Hieraaetus pennatus	A	A	**A**	A	B	—	B	A	**A**	**B**	**A/B**
Lanius collurio	A	A	**A**	A	A	—	A	A	**A**	**A**	**A**
Lullula arborea	A	A	**A**	A	B	—	A	A	**A**	**A**	**A/B**
Luscinia svecica	A	A	**A**	A	A	—	A	A	**A**	**A**	**A**
Milvus migrans	A	A	**A**	A	A	—	A	B	**A**	**A**	**A/B**
Neophron percnopterus	A	A	**A**	A	C	—	C	B	**B**	**B**	**B**
Pernis apivorus	A	A	**A**	A	B	—	B	A	**A**	**A**	**A/B**
Pyrrhocorax pyrrhocorax	A	A	**A**	A	A	—	A	A	**A**	**A**	**A**

[59] Assess whether reference values are satisfactory.
[60] Assess the conservation degree of the species habitat.
[61] Assess whether reference values (of the distribution area) are satisfactory.
[62] A: No P or T of high importance and up to 1 of medium importance, B: Up to 3 P or T of medium importance, C: At least 1 T or P of high importance and/or more than 3 P or T of medium importance.
[63] A = easy, B = possible with an average effort, C = difficult or impossible.
[64] Conservation degree = A (excellent conservation), B (good conservation), C (moderate/limited conservation, A/B (conservation degree is a result of expert judgment, needs to be evaluated with field data).
[65] According to observations, there is a clear threat to one of the species colonies (not the entire population within the site) rated as high because it has already caused a lot of damage. That threat does not refer to habitat quality, but to disturbance from hikers. So this needs to be reflected in scheme, in this calculation system.

Table 16. Conservation degree results for target birds in the project area (28 species)

Conservation degree = A (excellent conservation)	Conservation degree = B (good conservation)	Conservation degree = A/B (if the conservation degree is assigned the value of 'A/B', it is based on expert judgment and needs to be further evaluated with field data)	Conservation degree = C (moderate or limited conservation)
13	3	12	0

Figure 14. Photo of *Neophron percnopterus* in the project area

Source: M. Ghasabyan

Mammals

The number of mammals included in Resolution 6 is nine and their conservation degree is calculated and presented in Tables 17 and 18. According to the analysis, all target mammals are classified as 'A/B' (Table 8). The biodiversity information used was collected and provided by Astghik Ghazaryan during the previous survey 2014-2017. Regular monitoring has never been done in this territory.

Also, an ichthyologist should study in the future the fish stock depletion level (possibly due to overfishing) and the possible pressure caused to *Lutra lutra* (included in the Action Plan).

Table 17. Conservation degree analysis of target mammals in the project area (9 species)

Species	Population (1)[66]	Habitat (2)[67]	Final evaluation of habitat and population (Group A = 1+2)	Area cover (3)[68]	Pressures & Threats (4)[69]	Positive impacts (5)	Future trend (6 = 4+5)	Future status (7 = 1)	Conservation prospects (Group B = 3+6+7)	Restoration possibility (Group C)[70]	Conservation degree (Group A, B, C)[71]
Canis lupus	A	A	**A**	A	B[72]	—	B	A	**A**	**A**	**A/B**
Lutra lutra	A	A	**A**	A	B	—	B	A	**A**	**B**	**A/B**
Lynx lynx	A	A	**A**	A	A	—	A	A	**A**	**A**	**A/B**
Myotis blythii	A	A	**A**	A	B	—	B	A	**A**	**B**	**A/B**
Myotis bechsteini	A	A	**A**	A	B	—	B	A	**A**	**B**	**A/B**
Miniopterus schreibersii	A	A	**A**	A	B	—	B	A	**A**	**B**	**A/B**
Rhinolophus ferrumequinum	A	A	**A**	A	B	—	B	A	**A**	**B**	**A/B**
Rhinolophus hipposideros	A	A	**A**	A	B	—	B	A	**A**	**B**	**A/B**
Ursus arctos	A	A	**A**	A	A	—	A	A	**A**	**A**	**A/B**

[66] Assess whether reference values are satisfactory.
[67] Assess the conservation degree of the species habitat.
[68] Assess whether reference values (of the distribution area) are satisfactory.
[69] A: No P or T of high importance and up to 1 of medium importance, B: Up to 3 P or T of medium importance, C: At least 1 T or P of high importance and/or more than 3 P or T of medium importance.
[70] A = easy, B = possible with an average effort, C = difficult or impossible.
[71] Conservation degree = A (excellent conservation), B (good conservation), C (moderate or limited conservation, A/B (conservation degree is a result of expert judgment and needs to be evaluated with field data).
[72] According to interviews with locals there is no big conflict between wolves and livestock husbandry.

Table 18. Conservation degree results for target mammals in the project area (9 species)

Conservation degree = A (excellent conservation)	Conservation degree = B (good conservation)	Conservation degree = A/B (if the conservation degree is assigned the value of 'A/B', it is based on expert judgment and needs to be further evaluated with field data)	Conservation degree = C (moderate or limited conservation)
0	0	9	0

Figure 15. Photo of *Myotis blythii* in the project area

Source: Astghik Ghazaryan

Overall evaluation and composition of elements

Conservation objectives of the protected object(s)

Conservation objectives calculation methodology per target habitat type and species

This part presents the conservation objectives for specific habitats and species with **conservation degree results as A/B, B, or C**, according to the revised list of species and habitats, under the EU4Environment Program. For the specific habitats and species, the pressures and threats are further analyzed, and respective management measures are proposed.

Based on the international practice followed within the EU for Natura 2000 site management, a conservation objectives methodology was developed and followed for the study needs. Pressures and threats are selected from the EU's latest release of the Final Pressure List.[73] The latter is a standard list used in the EU for reporting on pressures and threats.

Natural habitat types

Considering the results of the assessment of the conservation degree of habitat types in Tables 7 and 8, the pressures and threats are further analyzed below - for habitats with conservation degree results A/B, B, or C - and respective conservation goals are identified.

According to experts, the site is characterized by an excellent conservation degree with low pressures and threats to the habitat, with no operations taking place apart from mild - though rising - activities such as tourism which must be controlled.

Table 19. Pressures and threats of habitat types in the project area

Habitat type	Pressures and threats[74]	Importance[75]	Conservation goal	Short-term[76]/medium-term[77] conservation objective: Area maintenance ≥ 90%	Long-term[78] conservation objective: Area increase at least by 10%/≥10%
				Habitat area cover (ha)[79]	
C2.26 Lime-rich oligotrophic vegetation of fast-flowing streams	PL05 Modification of hydrological flow	M	Area maintenance	125	153
C2.27 Mesotrophic vegetation of fast-flowing streams	PL05 Modification of hydrological flow	M	Area maintenance	70	86
C2.28 Eutrophic vegetation of fast-flowing streams	PL05 Modification of hydrological flow	M	Area maintenance	60	73
C3.4 Species-poor beds of low-growing water-fringing or amphibious vegetation	PL05 Modification of hydrological flow	M	Area maintenance	4	5
C3.55 Sparsely vegetated river gravel banks	PL05 Modification of hydrological flow	M	Area maintenance	—	—
C3.62 Unvegetated river gravel banks	PL05 Modification of hydrological flow	M	Area maintenance	—	—

[73] https://cdr.eionet.europa.eu/help/natura2000/
[74] https://cdr.eionet.europa.eu/help/natura2000/
[75] L = low, M = medium, H = high importance.
[76] 1–6 years.
[77] 6–12 years.
[78] >12 years.
[79] The values were assigned based on experts' assessment and satellite mapping (without field observations).

E1.2 Perennial calcareous grassland and basic steppes	PA07 Overgrazing	M	Area maintenance	2,840	3471
E1.3 Mediterranean xeric grassland	PA07 Overgrazing	M	Area maintenance - Compliance with Sustainable Grazing Management Plan program (for example, grazing frequency, pasture productivity per area)	270	330
E2.3 Mountain hay meadows	PA07 Overgrazing	M		8,100	9,900
E3.4 Moist or wet eutrophic and mesotrophic grassland	PA07 Overgrazing	M		960	1,173
E5.4 Moist or wet tall-herb and fern fringes and meadows	PA07 Overgrazing	M		338	413
E5.5 Subalpine moist or wet tall-herb and fern stands	PA07 Overgrazing	M		625	764
F7 Spiny Mediterranean heaths	PA07 Overgrazing	M		—	—
F9.1 Riverine scrub	PL05 Modification of hydrological flow	M	Area maintenance	110 ha	134 ha
G1.11 Riverine willow woodland	PB06 Logging or thinning (excluding clear-cutting)	M	Area maintenance	118 ha	144 ha
G1.22 Mixed oak - elm - ash woodland of great rivers	PB06 Logging or thinning (excluding clear-cutting)	M	Area maintenance	2,270	2,774
G1.6 Beech woodland	PB06 Logging or thinning (excluding clear-cutting)	M	Area maintenance	12,175	14,881
G1.A1 Oak-ash-hornbeam woodland on eutrophic and mesotrophic soils	PB06 Logging or thinning (excluding clear-cutting)	M	Area maintenance	4,755	5,812
G1.A7 Mixed deciduous woodland of the Black and Caspian Seas	PB06 Logging or thinning (excluding clear-cutting)	M	Area maintenance	3,780	4,620
G3.9 Coniferous woodland dominated by Cupressaceae or Taxaceae	PA07 Overgrazing	M	Area maintenance	180	220
H1 Caves	PF05 Sports, tourism, and leisure activities	M	Area maintenance	—	—

According to the above table, the conservation objectives aim to maintain the present habitat area in the short and long term. The short-term[80]/medium-term[81] conservation goal is to maintain at least 90 percent of the current habitat area cover and the long-term[82] goal is to increase the current habitat area cover by at least 10 percent.

The biodiversity information used to assess the conservation objectives and pressures was collected and provided by Fayvush and Aleksanyan based on personal field investigations and the monograph 'Habitats of Armenia' (Fayvush and Aleksanyan 2016). It should be emphasized that some data on distribution and areas of some habitats are missing. Thus, there is a need for monitoring and update information through fieldwork.

Species

Plants

Considering the results of the conservation degree assessment of the revised list (2023–2024) of plant species in Tables 9 and 10, the pressures and threats are analyzed in Table 20 together with the respective management measures.

The biodiversity information used to assess the conservation objectives and pressures was collected and provided by G. Fayvush based on personal fieldworks, the multivolume edition of 'Flora of Armenia' (Takhtajan

[80] 1–6 years.
[81] 6–12 years.
[82] >12 years.

1954–2009), and the herbarium data from the Institute of Botany after A. Takhtadjyan NAS RA (ERE). It should be emphasized that data on *Steveniella satyrioides* are incomplete and there is a need for location mapping and conservation monitoring.

Table 20. Pressures and threats of target plant species

Species	Pressures and threats[83]	Importance[84]	Conservation goal	Conservation objective[85]
Echium russicum	PA07 Overgrazing	M	Population maintenance	Between 500 and 2000
	PG10 Harvesting or collecting of wild plants, fungi and animals on terrestrial land	M	Population maintenance	
Steveniella satyrioides	PF05 Sports, tourism and leisure activities	M	Population maintenance	>20

According to the above table, the conservation objectives aim to maintain the present population.

Invertebrates

Considering the results of the conservation degree assessment of the revised list (2023-2024) of invertebrates (Tables 11 and 12), the pressures and threats of target invertebrates are analyzed in Table 21.

Table 21. Pressures and threats of invertebrates

Species	Pressures and threats[86]	Importance[87]	Conservation goal	Population conservation goal[88]
Callimorpha (Euplagia) quadripunctaria)	PB02 Conversion from one type of forestry land use to another	M	Population maintenance	>50
Rosalia alpina	PB07 Removal of dead and dying trees (including debris)	M	Population maintenance - Preservation of a part of overgrown and decaying trees during sanitary logging	>50
	PB08 Removal of old trees (excluding dead or dying trees)	M		
Cerambyx cerdo	PB07 Removal of dead and dying trees (including debris)	M	Population maintenance - Preservation of a part of overgrown and decaying trees during sanitary logging	>50
	PB08 Removal of old trees (excluding dead or dying trees)	M		

According to the above table, the conservation objectives aim to maintain the present population through habitat protection, for example, preservation of a part of overgrown and shrinking trees during sanitary logging.

Reptiles

Considering the results of the assessment of the conservation degree of the revised list (2023-2024) of reptiles in Tables 13 and 14, which were collected by Prof. M. Arakelyan during the previous Emerald Network review (2016), no specific pressures and threats have been identified. Nevertheless, it should be emphasized that data are incomplete and there is a need for organized monitoring in the project area.

Birds

Considering the results of the assessment of the conservation degree of the revised list (2023-2024) of bird species in Tables 15 and 16, the pressures and threats are analyzed in Table 22.

[83] https://www.eea.europa.eu/en
[84] L = low, M = medium, H = high importance.
[85] The values were assigned based on the SDF. The current SDF does not include the revised list (2023–2024) of species and habitats and expert observation.
[86] https://www.eea.europa.eu/en
[87] L = low, M = medium, H = High importance.
[88] The values were assigned based on the SDF—note that the current SDF does not include the revised list (2023–2024) of species and habitats—and expert observation.

It should be stated that the conservation degree - for the majority - of the species presented in Table 22 is a result of expert judgment, and communication with other experts and locals and further evaluation and field monitoring are required.

It should also be clear that the assessment below may refer to an observed local threat that may affect only one of the colonies of the species at the specific site. In that case, the threat should not be - and it is not - extrapolated to the rest of the population.

Table 22. Pressures and threats of target birds

Species	Pressures and threats[89]	Importance[90]	Conservation goal	Conservation objective [91]
Aquila chrysaetos	PG11 Illegal shooting/killing	M	Population maintenance -Control and prevent illegal shooting/killing	1–2 pairs
Aquila pomarina	PG11 Illegal shooting/killing	M	Population maintenance -Control and prevent illegal shooting/killing	1–3 pairs
	PB06 Logging or thinning (excluding clear-cutting)	M	Population maintenance/Habitat maintenance - Control and prevention of logging (both for commercial gain and sanitary cuttings)	
Aquila nipalensis	PG11 Illegal shooting/killing	M	Population maintenance - Control and prevent illegal shooting/killing	Unknown - No info in SDF
Buteo rufinus	PG11 Illegal shooting/killing	M	Population maintenance - Control and prevent illegal shooting/killing	3–7 pairs
Circaetus gallicus	PG11 Illegal shooting/killing	L	Population maintenance - Control and prevent illegal shooting/killing	Unknown - No info in SDF
Circus macrourus	PG11 Illegal shooting/killing	L	Population maintenance - Control and prevent illegal shooting/killing	Unknown - No info in SDF
Crex crex	PA06 Mowing or cutting of grasslands"	M	Population maintenance - Adapt timing of grassland mowing	>8,000 ha
	PA07 Overgrazing	M	Habitat maintenance - Adapt timing and intensity of grazing activities	>8,000 ha
	PG11 Illegal shooting/killing	M	Population maintenance - Control and prevent illegal shooting/killing and collection of eggs	>20
Dendrocopos medius	PB06 Logging or thinning (excluding clear-cutting)	M	Population maintenance/Habitat maintenance - Control and prevention of logging (both for commercial gain and sanitary cuttings)	>10
	PB08 Removal of old trees (excluding dead or dying trees)	M	Population maintenance/Habitat maintenance - Control and prevention of logging (both for commercial gain and sanitary cuttings)	
Dryocopus martius	PB06 Logging or thinning (excluding clear-cutting)	M	Population maintenance - Preservation of a part of overgrown and decaying trees during sanitary logging	1–2 pairs
	PB07 Removal of dead and dying trees (including debris)	M	Population maintenance - Control and prevention of logging (both for commercial gain and sanitary cuttings)	
	PB08 Removal of old trees (excluding dead or dying trees)	M	Population maintenance - Control and prevention of logging (both for commercial gain and sanitary cuttings)	
Falco peregrinus	PG11 Illegal shooting/killing	M	Population maintenance - Control and prevent illegal shooting/killing and collection of eggs	Unknown - No info in SDF

[89] https://www.eea.europa.eu/en
[90] L = low, M = medium, H = high importance.
[91] The values were assigned based on the SDF. The current SDF does not include the revised list (2023-2024) of species and habitats and expert observation.

	PG12 Illegal harvesting, collecting and taking	M	Population maintenance - Control and prevent illegal shooting/killing and collection of eggs and taking of the nestlings	
Ficedula parva	PB06 Logging or thinning (excluding clear-cutting)	M	Population maintenance - Control and prevention of logging (both for commercial gain and sanitary cuttings)	>80
	PB08 Removal of old trees (excluding dead or dying trees)	M	Population maintenance/Habitat maintenance - Control and prevention of logging (both for commercial gain and sanitary cuttings)	>10,000 ha
Ficedula semitorquata	PB06 Logging or thinning (excluding clear-cutting)	M	Population maintenance/Habitat maintenance – Control and prevention of logging (both for commercial gain and sanitary cuttings)	>50
	PB08 Removal of old trees (excluding dead or dying trees)	M	Population maintenance/Habitat maintenance – Control and prevention of logging (both for commercial gain and sanitary cuttings)	>10,000 ha
Gypaetus barbatus	PF05 Sports, tourism and leisure activities	H	Population maintenance - Limit recreational activities near nesting grounds (Restrict the activities in the species nesting ground by hikers, rock-climbers, or any other tourist activity throughout the breeding period)	1-2 pairs
Gyps fulvus	PF05 Sports, tourism and leisure activities	H	Population maintenance - Limit recreational activities near nesting grounds	8–10 pairs
Hieraaetus pennatus	PG11 Illegal shooting/killing	M	Population maintenance - Control and prevent illegal shooting/killing	3 pairs
	PB06 Logging or thinning (excluding clear-cutting)	M	Population maintenance/Habitat maintenance - Control and prevention of logging (both for commercial gain and sanitary cuttings)	
Lullula arborea	PA06 Mowing or cutting of grasslands	L	Population maintenance - Adapt timing of grassland mowing	Unknown - No info in SDF
Luscinia svecica	PA06 Mowing or cutting of grasslands	L	Population maintenance - Adapt timing of grassland mowing	>15
	PA07 Overgrazing	L	Population maintenance/Habitat maintenance - Adapt timing and intensity of grazing activities	>8,000 ha
Milvus migrans	PG11 Illegal shooting/killing	M	Population maintenance - Control and prevent illegal shooting/killing	Unknown - No info in SDF
Neophron percnopterus	PF05 Sports, tourism and leisure activities[92]	M	Population maintenance - Limit recreational activities near nesting grounds	2–4 pairs
Pernis apivorus	PG11 Illegal shooting/killing	M	Population maintenance - Control and prevent illegal shooting/killing	Unknown - No info in SDF

According to the above table, the conservation objectives aim to (a) maintain the population of target species and (b) improve the overall degree of conservation of their habitat. The main threat to birds is their habitat loss and fragmentation as a result of intensive logging, both illegal (for commercial gain) and legitimate (defined as 'sanitary cuttings'). Removal of mature trees, especially in the spring and summer, hinders the breeding of

[92] Illegal shooting/killing is not a common threat to vultures in Ijevan or outside of it, which has been confirmed officially by the local Environmental Inspectorate, reported by local caretakers in Ijevan, and even cross-checked with the members of an ornithological community.

large raptors (for example, lesser-spotted eagle [LSE] *Aquila pomarina*) and other large species that are sensitive to disturbance. Similarly, removal of dead trees with hollows reduces the overall health of the forest and hence limits the nesting and foraging opportunities for rare and specialist forest species such as woodpeckers, flycatchers, and owls. Another predominant threat is illegal hunting of migratory and resident large birds of prey, especially for illegal trade. Human disturbance, unregulated hiking tourism, and rock-climbing have already negatively affected the nesting success of vultures in the site.

Mammals

Considering the results of the assessment of the conservation degree of target mammals in Tables 17 and 18, the pressures and threats are analyzed in Table 23 together with the respective management measures.

The biodiversity information used to assess the conservation objectives and pressures was collected and provided by Astghik Ghazaryan. Regular monitoring has never been done in this territory. All the data provided were collected by experts during research.

Table 23. Pressures and threats of target mammals

Species	Pressures and threats[93]	Importance[94]	Conservation goal	Conservation objective [95]
Canis lupus	PJ12 Decline or extinction of related species (for example, food source/prey, predator/parasite, and symbiote) due to climate change	M	Population maintenance	>20
	PJ13 Change of species distribution (natural newcomers) due to climate change	M	Population maintenance	
Lutra lutra	PG11 Illegal shooting/killing	M	Population maintenance	>20
	PL05 - Modification of hydrological flow	M	Habitat maintenance	>100 ha
Lynx lynx[96]	PJ12 Decline or extinction of related species (for example, food source/prey, predator/parasite, and symbiote) due to climate change	M	Population maintenance	>20
	PJ13 Change of species distribution (natural newcomers) due to climate change	M	Population maintenance	
Myotis blythii	PF05 Sports, tourism and leisure activities	M	Population maintenance - Control and limitation of visitor's number of caves	>30
Myotis bechsteini	PB08 Removal of old trees (excluding dead or dying trees)	M	Population maintenance - Preservation of a part of overgrown and decaying trees during sanitary logging	>30
Miniopterus schreibersii	PF05 Sports, tourism and leisure activities	M	Population maintenance - Control and limitation of visitor's number of caves	>30
Rhinolophus ferrumequinum	PF05 Sports, tourism and leisure activities	M	Population maintenance - Control and limitation of visitor's number of caves	>30

[93] https://www.eea.europa.eu/en
[94] L = low, M = medium, H = high importance.
[95] The values were assigned based on the SDF. The current SDF does not include the revised list (2023–2024) of species and habitats and expert observation.
[96] According to interviews with locals and our own data collected during 2014–2017, there was no illegal shooting and trapping on linx.

Rhinolophus hipposideros	PF05 Sports, tourism and leisure activities	M	Population maintenance - Control and limitation of visitor's number of caves	>30
Ursus arctos	PG11 Illegal shooting/killing	M	Population maintenance	>5

According to the above table, the conservation objectives aim to maintain the present population through specific control actions and limitations.

Assessment of potential conflicts between the conservation of the natural environment and economic activities and its development potential

Natural habitat types

As mentioned above, the main threats to woodlands could be illegal logging and removal of old trees during sanitary cutting. For water habitats, the main threat could be uncontrolled change of water regime (in case of upstream hydro construction such as water storage reservoirs abstracting water and small hydropower plants). For grasslands, the main threat is overgrazing. Thus, specific measures are included in the Action Plan.

Species

Plants

For *Echium russicum*, the main threat is overgrazing which could lead to habitat destruction. Control on grazing norms is strongly suggested. Regarding *Steveniella satyrioides* other threats could be incidental destruction of populations by tourists. The best measure for maintaining population is fencing localities.

Invertebrates

For *Rosalia alpina* and *Cerambyx cerdo,* the main threat is forestry practice which may lead to removal of old and dying trees which may lead to the disappearance of microbiotopes suitable for larval development. Control on logging is necessary. For *Callimorpha (Euplagia) quadripunctaria,* there are currently no registered threats, but control on habitat conditions and the population density is needed.

Reptiles

No specific threats and conflicts have been identified.

Birds

A range of actual direct and indirect pressures and threats have been identified as primary in the site and assessed based on their impact on bird populations concerned. Both legal and illegal logging activities such as removal of mature and dead trees, clear-cutting, and selective logging result in the habitat loss and fragmentation, disrupting the natural ecosystems that birds depend on for nesting, foraging, and other activities. Forest operations, whether legal or illegal, are therefore a key pressure that have a significant ecosystem-level impact on bird populations. Illegal hunting targeting raptors requires comprehensive measures, including increased enforcement of wildlife protection laws and education for those involved in poaching.

Additionally, as a result of the expanding power line network and the growing demand for electricity in Armenia, this significant threat is likely to increase. Considering the vast spatial nature of such development projects which may span various elevations and include all types of vertical habitat landscapes from dense woodland areas to subalpine and alpine grasslands, it is important to consider the potential impacts of these projects on local birdlife. Power lines can trigger collision or electrocution risks for raptor species in the long run, especially those using a low-flying hunting technique (for example harriers and kestrels).

Unregulated hiking tourism in the immediate vicinities of such endangered species as vultures negatively affects their nesting success. This threat is also likely to increase in future owing to the continuously growing interest among hikers. Monitoring and managing such visitation activities for tourism development purposes is paramount and urgent.

Finally, livestock husbandry and grazing practices can be included only potentially but not as an actual threat, as there is no relevant source or observation A targeted research to assess if it is a factor affecting birds in the site needs to be held.

Mammals

There have been no specific threats or conflicts or incidents involving wolves and livestock husbandry in the area according to the locals.

Implementation

Action Plan (objectives and priority actions)

A set of recommendations, that is, conservation measures, for a 10-year duration are presented in this chapter. Based on the pressures and threats analyzed in the previous chapter, a set of respective management measures are proposed to address them. Conservation measures are selected from the EU latest release of the Final Conservation Measures List.[97]

Allocation and timetable for each activity are presented in Annex B. The Action Plan includes, for each measure, the protected target species/habitats/sites, a short description of the measure, the appropriate monitoring indicator, a yearly timetable on a 10-year projection, and the responsible actor for implementing the proposed measure.

Natural habitat types

Table 24 presents the proposed management measures for habitat types in the project area and the expected effectiveness time span. Further information is available in the Action Plan.

Table 24. Proposed management measures for habitat types in the project area

Habitat type	Pressures and threats[98]	Management measures[99]	Expected benefit (H, M, or L[100]) and expected time frame of effectiveness (short term, medium term, or long term)
C2.26 Lime-rich oligotrophic vegetation of fast-flowing streams	PL05 Modification of hydrological flow	MK02 - Reduce impact of multi-purpose hydrological changes	H/Long term
C2.27 Mesotrophic vegetation of fast-flowing streams	PL05 Modification of hydrological flow	MK02 - Reduce impact of multi-purpose hydrological changes	H/Long term
C2.28 Eutrophic vegetation of fast-flowing streams	PL05 Modification of hydrological flow	MK02 - Reduce impact of multi-purpose hydrological changes	H/Long term
C3.4 Species-poor beds of low-growing water-fringing or amphibious vegetation	PL05 Modification of hydrological flow	MK02 - Reduce impact of multi-purpose hydrological changes	H/Long term
C3.55 Sparsely vegetated river gravel banks	PL05 Modification of hydrological flow	MK02 - Reduce impact of multi-purpose hydrological changes	H/Long term
C3.62 Unvegetated river gravel banks	PL05 Modification of hydrological flow	MK02 - Reduce impact of multi-purpose hydrological changes	H/Long term
E1.2 Perennial calcareous grassland and basic steppes	PA07 Intensive grazing or overgrazing by livestock	MA05 - Adapt mowing, grazing and other equivalent agricultural activities (e.g. burning)	M/Medium term
E1.3 Mediterranean xeric grassland	PA07 Intensive grazing or overgrazing by livestock	MA05 - Adapt mowing, grazing and other equivalent agricultural activities (e.g. burning)	M/Medium term
E2.3 Mountain hay meadows	PA07 Intensive grazing or overgrazing by livestock	MA05 - Adapt mowing, grazing and other equivalent agricultural activities (e.g. burning)	M/Medium term
E3.4 Moist or wet eutrophic and mesotrophic grassland	PA07 Intensive grazing or overgrazing by livestock	MA05 - Adapt mowing, grazing and other equivalent agricultural activities (e.g. burning)	M/Medium term
E5.4 Moist or wet tall-herb and fern fringes and meadows	PA07 Intensive grazing or overgrazing by livestock	MA05 - Adapt mowing, grazing and other equivalent agricultural activities (e.g. burning)	M/Medium term
E5.5 Subalpine moist or wet tall-herb and fern stands	PA07 Intensive grazing or overgrazing by livestock	MA05 - Adapt mowing, grazing and other equivalent agricultural activities (e.g. burning)	M/Medium term

[97] https://cdr.eionet.europa.eu/help/natura2000/
[98] Chapter "Overall evaluation and composition of elements"
[99] https://cdr.eionet.europa.eu/help/natura2000/
[100] H = High, M = Moderate, L = Low.

F7 Spiny Mediterranean heaths	PA07 Intensive grazing or overgrazing by livestock	MA05 - Adapt mowing, grazing and other equivalent agricultural activities (e.g. burning)	M/Medium term
F9.1 Riverine scrub	PL05 Modification of hydrological flow	MK02 - Reduce impact of multi-purpose hydrological changes	H/Long term
G1.11 Riverine willow woodland	PB06 Logging or thinning (excluding clear-cutting)	MB05 - Adapt/change forest management and exploitation practices	M/Long term
G1.22 Mixed oak - elm - ash woodland of great rivers	PB06 Logging or thinning (excluding clear-cutting)	MB05 - Adapt/change forest management and exploitation practices	M/Long term
G1.6 Beech woodland	PB06 Logging or thinning (excluding clear-cutting)	MB05 - Adapt/change forest management and exploitation practices	M/Long term
G1.A1 Oak-ash-hornbeam woodland on eutrophic and mesotrophic soils	PB06 Logging or thinning (excluding clear-cutting)	MB05 - Adapt/change forest management and exploitation practices	M/Long term
G1.A7 Mixed deciduous woodland of the Black and Caspian Seas	PB06 Logging or thinning (excluding clear-cutting)	MB05 - Adapt/change forest management and exploitation practices	M/Long term
G3.9 Coniferous woodland dominated by Cupressaceae or Taxaceae	PA07 Intensive grazing or overgrazing by livestock	MB05 - Adapt/change forest management and exploitation practices)	M/Medium term
H1 Caves	PF05 Sports, tourism and leisure activities	MF03 - Reduce impact of outdoor sports, leisure and recreational activities (incl. restoration of habitats)	M/Medium term

Possible modification of hydrological flow and logging, for example, for fire fuel, is one of the possible pressures in the habitat area. Overgrazing (or intensive grazing) is also a common pressure. Thus, a site-specific Grazing Management Plan is recommended (included in the Action Plan), that should primarily take into account the biodiversity target objects and conservation aspects as per pasture productivity and livestock economy.

Species

Plants

Table 25 presents the proposed management measures for the target plant species in the project area and the expected effectiveness time span. Further information is available in the Action Plan.

Table 25. Proposed management measures of target plant species

Species	Pressures and threats[101]	Management measures[102]	Expected benefit (H, M, or L) and Expected time frame of Effectiveness (Short term, Medium term, or Long term)
Echium russicum	PA07 Intensive grazing or overgrazing by livestock	MA05 - Adapt mowing, grazing and other equivalent agricultural activities (e.g. burning)	M/Medium term
Steveniella satyrioides	PF05 Sports, tourism and leisure activities	MF03 - Reduce impact of outdoor sports, leisure and recreational activities (incl. restoration of habitats)	M/Medium term

[101] https://www.eea.europa.eu/en
[102] https://www.eea.europa.eu/en

Invertebrates

Table 26 presents the proposed management measures for the target invertebrates in the project area and the expected effectiveness time span. Further information is available in the Action Plan.

Table 26. Proposed management measures of invertebrates

Species	Pressures and threats[103]	Management measures[104]	Expected benefit (H, M, or L and expected time frame of effectiveness (short term, medium term, or long term)
Callimorpha (Euplagia) quadripunctaria	PB02 Conversion from one type of forestry land use to another	MB01 - Prevent conversion of (semi-) natural habitats into forests and of (semi-) natural forests into intensive forest plantation	M/Medium term
Rosalia alpina	PB07 Removal of dead and dying trees (including debris)	MB05 - Adapt/change forest management and exploitation practices	M/Medium term
	PB08 Removal of old trees (excluding dead or dying trees)	MB05 - Adapt/change forest management and exploitation practices	M/Medium term
Cerambyx cerdo	PB07 Removal of dead and dying trees (including debris)	MB05 - Adapt/change forest management and exploitation practices	M/Medium term
	PB08 Removal of old trees (excluding dead or dying trees)	MB05 - Adapt/change forest management and exploitation practices	M/Medium term

A pilot application proposed is the registration of trees suitable for development of xylophagous species as the objects of control and conservation, with further observation on their use by target species.

Reptiles

No specific management measures are required.

Birds

One of the most urgent pressures that needs to be regulated is the disturbance factor that comes from tourism and visitation of nesting grounds of sensitive species, such as griffon vulture (*Gyps fulvus*). It is essential to minimize the impacts associated with tourism activities in the site and ensure that such activities do not compromise biodiversity objectives. Any hiking routes currently in use or planned for development in the site should consult zoological records and avoid disruption of nesting of rare and endangered species. Increased human activity along hiking trails disturbs wildlife, causing displacement. Nesting birds, for example, may abandon their nests in response to human presence, leading to decreased reproductive success.

Another main threat to birds is habitat destruction because of intensive logging. About 49 percent of forests in the area are located on steep slopes of 30° and greater. In such forests, especially on southern slopes, the erosion process is severe and natural regrowth is limited. Restoration of degraded (previously logged) forest ecosystems is of paramount importance, necessary to improve populations of endangered species and ensure integrity of ecosystems. This implies forest rehabilitation activities especially in the habitats of endangered species.

[103] https://www.eea.europa.eu/en
[104] https://www.eea.europa.eu/en

Table 27. Proposed management measures of target

Species	Pressures and threats[105]	Management measures	Expected benefit (H, M, or L) and expected time frame of effectiveness (short term, medium term, or long term)
Aquila chrysaetos	PG11 Illegal shooting/killing[106]	MG04 - Control/eradication of illegal killing, fishing and harvesting of wild plants, fungi and animals	H/Medium term
Aquila pomarina	PG11 Illegal shooting/killing	MG04 - Control/eradication of illegal killing, fishing and harvesting of wild plants, fungi and animals	H/Medium term
	PB06 Logging or thinning (excluding clear-cutting)	MB05 - Adapt/change forest management and exploitation practices[107]	H/Medium term
Aquila nipalensis	PG11 Illegal shooting/killing	MG04 - Control/eradication of illegal killing, fishing and harvesting of wild plants, fungi and animals	H/Medium term
Buteo rufinus	PG11 Illegal shooting/killing	MG04 - Control/eradication of illegal killing, fishing and harvesting of wild plants, fungi and animals	H/Medium term
Circaetus gallicus	PG11 Illegal shooting/killing	MG04 - Control/eradication of illegal killing, fishing and harvesting of wild plants, fungi and animals	H/Medium term
Circus macrourus	PG11 Illegal shooting/killing	MG04 - Control/eradication of illegal killing, fishing and harvesting of wild plants, fungi and animals	H/Medium term
Crex crex	PA06 Mowing or cutting of grasslands"	MA05 - Adapt mowing, grazing and other equivalent agricultural activities (e.g. burning)	M/Long term
	PA07 Intensive grazing or overgrazing by livestock	MA05 - Adapt mowing, grazing and other equivalent agricultural activities (e.g. burning)	M/Long term
	PG11 Illegal shooting/killing	MG04 - Control/eradication of illegal killing, fishing and harvesting of wild plants, fungi and animals	M/Long term
Dendrocopos medius	PB06 Logging or thinning (excluding clear-cutting)	MB05 - Adapt/change forest management and exploitation practices	M/Long term
	PB08 Removal of old trees (excluding dead or dying trees)	MB05 - Adapt/change forest management and exploitation practices	M/Long term
Dryocopus martius	PB06 Logging or thinning (excluding clear-cutting)	MB05 - Adapt/change forest management and exploitation practices	M/Long term
	PB07 Removal of dead and dying trees (including debris)	MB05 - Adapt/change forest management and exploitation practices	M/Long term
	PB08 Removal of old trees (excluding dead or dying trees)	MB05 - Adapt/change forest management and exploitation practices	M/Long term
Falco peregrinus	PG11 Illegal shooting/killing	MG04 - Control/eradication of illegal killing, fishing and harvesting of wild plants, fungi and animals	H/Medium term
	PG12Illegal harvesting, collecting and taking		H/Medium term

[105] https://www.eea.europa.eu/en
[106] The PG11 threat includes Illegal shooting, killing, and hunting. Hunting of *all raptors* in Armenia is banned and is illegal a priori.
[107] Logging of any sort (legal sanitary or illegal) must be excluded in the areas especially in spring to minimize disturbance and impact on nesting species.

Species	Pressures and threats[105]	Management measures	Expected benefit (H, M, or L) and expected time frame of effectiveness (short term, medium term, or long term)
Ficedula parva	PB06 Logging or thinning (excluding clear-cutting)	MB05 - Adapt/change forest management and exploitation practices	M/Long term
	PB08 Removal of old trees (excluding dead or dying trees)	MB05 - Adapt/change forest management and exploitation practices	M/Long term
Ficedula semitorquata	PB06 Logging or thinning (excluding clear-cutting)	MB05 - Adapt/change forest management and exploitation practices	M/Long term
	PB08 Removal of old trees (excluding dead or dying trees)	MB05 - Adapt/change forest management and exploitation practices	M/Long term
Gypaetus barbatus	PF05 Sports, tourism and leisure activities	MF03 - Reduce impact of outdoor sports, leisure and recreational activities (incl. restoration of habitats)	H/Short term
Gyps fulvus	PF05 Sports, tourism and leisure activities	MF03 - Reduce impact of outdoor sports, leisure and recreational activities (incl. restoration of habitats)	H/Short term
Hieraaetus pennatus	PG11 Illegal shooting/killing	MG04 - Control/eradication of illegal killing, fishing and harvesting of wild plants, fungi and animals	H/Medium term
	PB06 Logging or thinning (excluding clear-cutting)	MB05 - Adapt/change forest management and exploitation practices	H/Medium term
Lullula arborea	PA06 Mowing or cutting of grasslands	MA05 - Adapt mowing, grazing and other equivalent agricultural activities (e.g. burning)	M/Medium term
Luscinia svecica	PA06 Mowing or cutting of grasslands	MA05 - Adapt mowing, grazing and other equivalent agricultural activities (e.g. burning)	M/Medium term
	PA07 Intensive grazing or overgrazing by livestock	MA05 – Adapt mowing, grazing and other equivalent agricultural activities (e.g. burning)	M/Medium term
Milvus migrans	PG11 Illegal shooting/killing	MG04 – Control/eradication of illegal killing, fishing and harvesting of wild plants, fungi and animals	H/Medium term
Neophron percnopterus	PF05 Sports, tourism and leisure activities	MF03 – Reduce impact of outdoor sports, leisure and recreational activities (incl. restoration of habitats)	H/Short term
Pernis apivorus	PG11 Illegal shooting/killing	MG04 – Control/eradication of illegal killing, fishing and harvesting of wild plants, fungi and animals	H/Short term

In addition, specifically for species *Aquila pomarina*, *Dendrocopos medius,* and *D. Martius,* forest operations should be restricted from the end of March to the end of September around nest sites sensitive to disturbance. Regarding species Gyps fulvus, unregulated tourism activities should be regulated near their nesting grounds in the breeding period (early March to end of July). Finally, enforcement of laws and vigilant monitoring - through the new Eco Patrol Service activities - is necessary to effectively control the illegal hunting of birds.

Mammals

Table 28 presents the proposed management measures for the target mammals in the project area and the expected effectiveness time span. Further information is available in the Action Plan.

Table 28. Proposed management measures of target mammals

Species	Pressures and threats[108]	Management measures	Expected benefit (H, M, or L) and expected time frame of effectiveness (short term, medium term, or long term)
Canis lupus	PJ12 Decline or extinction of related species (e.g. food source/prey, predator/parasite, symbiote, etc.) due to climate change	MJ02 - Implement climate change adaptation measures	M/Long term
	PJ13 Change of species distribution (natural newcomers) due to climate change	MJ02 - Implement climate change adaptation measures	M/Long term
Lutra lutra	PG11 Illegal shooting/killing	MG04 - Control/eradication of illegal killing, fishing and harvesting of wild plants, fungi and animals	H/Medium term
	PL05 – Modification of hydrological flow	MK02 - Reduce impact of multi-purpose hydrological changes	M/Long term
Lynx lynx	PJ12 Decline or extinction of related species (e.g. food source/prey, predator/parasite, symbiote, etc.) due to climate change	MJ02 - Implement climate change adaptation measures	M/Long term
	PJ13 Change of species distribution (natural newcomers) due to climate change	MJ02 - Implement climate change adaptation measures	M/Long term
	PG11 Illegal shooting/killing	MG04 - Control/eradication of illegal killing, fishing and harvesting of wild plants, fungi and animals	H/Medium term
Myotis blythii	PF05 Sports, tourism and leisure activities	MF03 - Reduce impact of outdoor sports, leisure and recreational activities (incl. restoration of habitats)	M/Medium term
Myotis bechsteini	PB08 Removal of old trees (excluding dead or dying trees)	MB05 - Adapt/change forest management and exploitation practices	M/Medium term
Miniopterus schreibersii	PF05 Sports, tourism and leisure activities	MF03 - Reduce impact of outdoor sports, leisure and recreational activities (incl. restoration of habitats)	M/Medium term
Rhinolophus ferrumequinum	PF05 Sports, tourism and leisure activities	MF03 - Reduce impact of outdoor sports, leisure and recreational activities (incl. restoration of habitats)	M/Medium term
Rhinolophus hipposideros	PF05 Sports, tourism and leisure activities	MF03 - Reduce impact of outdoor sports, leisure and recreational activities (incl. restoration of habitats)	M/Medium term
Ursus arctos	PG11 Illegal shooting/killing	MG04 - Control/eradication of illegal killing, fishing and harvesting of wild plants, fungi and animals	M/Medium term

FE Management measures

A brief analysis of the management measures proposed in the active FEs is presented below. The objective is to verify (and ensure with specific corrective measures if needed) that the management measures proposed in the Fes - and implemented by the SNCO - are in line with and not against the conservation objectives of the Emerald MP.

[108] https://www.eea.europa.eu/en

Table 29. Management measures in Sevkar and Ijevan FEs (from MPs in Armenia)

Category of management measure	Title of management measure	Inline/inline under conditions/against	Comments/correction actions
Fire protection measures	Installation of warning signs and boards	Inline	—
	Particularly defined picnic and smoking areas	Inline	—
	Consultations and meetings with communities and residents	Inline	—
	Construction of fire break zones	Inline under conditions	Fire zones should avoid reducing the habitat area or target species habitats. Before implementing the fire break zones a target species monitoring audit is recommended. Avoid reproduction periods of target species. For species *Aquila pomarina, Dendrocopos medius, D. Martius,* and others, forest operations should be restricted from the end of March to the end of September around nest sites sensitive to disturbance.
	Construction of reservoirs	Inline	
	Repair/add new forest fire protection roads	Inline under conditions	New roads should avoid reducing the habitat area or target species habitats. A walk-over audit for the target species is recommended. Avoid reproduction periods of target species. For species *Aquila pomarina, Dendrocopos medius,* and *D. martius,* forest operations should be restricted from the end of March to the end of September around nest sites sensitive to disturbance. For *Gyps fulvus*, unregulated tourism activities should be regulated near their nesting grounds in the breeding period (early March to end of July).
	Acquisition of firefighting equipment	Inline	—
	Formation of volunteer firefighting groups	Inline	—
Forest and Biodiversity Conservation	Hiring of forest guards	Inline	Expand the surveillance area in the whole Emerald site
	Acquisition of various equipment	Inline	All-terrain vehicles, horses, GPS devices, and others
	Reforestation	Inline	—
	Felling for research and forest health	Inline	—
Scientific studies and monitoring	Scientific studies including endangered species, creation and maintenance of biodiversity databases, vulnerability and adaptation to climate change and ecosystem services	Inline	—
	Field monitoring involving volunteers: NGOs,[109] schools, universities	Inline	—

[109] NGO = Non-governmental organization.

	Development of a monitoring program that will include indicator species to identify trends in the state of ecosystems	Inline	—
	Development of monitoring database/software and protocols	Inline	—
	Tourism monitoring, with management of environmental and social impact of tourists	Inline	—
	Monitoring of personnel and technical staff to receive capacity building and organize practical trainings	Inline	—
Sustainable tourism showcasing part of local and national culture	Ecotourism activities, such as bird watching	Inline	Two eco-routes have been developed for the sanctuary area that include bird watching opportunities. It is essential to minimize the impacts associated with tourism activities in the site and ensure that such activities do not compromise biodiversity objectives. Any hiking routes currently in use or planned for development in the site should consult zoological records and avoid disruption of nesting of rare and endangered species. Increased human activity along hiking trails disturbs wildlife, causing displacement. Nesting birds, for example, may abandon their nests in response to human presence, leading to decreased reproductive success.
	Development of tourism services and infrastructure such as trails, horseback riding, guesthouses (no specific location or other information provided by FE MP)	Inline under conditions	
	Creation of a tourism information kiosk	Inline	Include information on the Emerald site protective species and habitats
	Recreational and sport activities, fishing in allocated areas	Inline under conditions	As above
Raising awareness, volunteering and other	Awareness raising among the residents of the communities adjacent to forestry, especially in schools	Inline	Include community related to the Emerald site
	Involvement of representatives of related communities and other local NGOs	Inline	Include stakeholders from the Emerald site
	Creation and maintenance of a forestry website	Inline	Inform the admin of the website to include awareness information about the Emerald site
	Organizing of various volunteering opportunities for reforestation, wildlife monitoring, and other activities	Inline	Include community that is active in the Emerald site

Resources required to carry out activities: (a) human, (b) time, and (c) finance

Governing/site management body

MoE will oversee the establishment and organization of the governing body responsible for managing the Emerald site. The governing body will have representatives from all stakeholder groups to ensure that a diverse range of perspectives and interests are considered in the decision-making process. This governance structure can enhance transparency and accountability. It can lead to more balanced decision-making but may also introduce challenges in reconciling conflicting interests. The governing body should have the necessary capacity and resources to effectively manage the site. Collaboration with other relevant government agencies, NGOs, and local authorities may be necessary. Operational rules for governing bodies will be defined by MoE and should accommodate changes in environmental conditions, societal needs, and emerging challenges. Regular reviews and updates of rules and management strategies are crucial for adaptive management.

Financial resources

The financial source for the necessary MP implementation is the central government and its annual budget allocation. Additional financing sources through controlled ecotourism and sustainable forest management should also be introduced by MoE in the future. In addition, any governmental action toward community-driven initiatives in protecting the area is also appreciated and should become a priority.

In parallel and in line with the priorities and management activities proposed, MoE is willing to participate in European and international research and applied biodiversity projects funded by international institutions, for example, the United Nations Development Programme (UNDP), German Agency for International Cooperation (Deutsche Gesellschaft für Internationale Zusammenarbeit, GIZ), EU, United States Agency for International Development (USAID), Global Environment Facility (GEF), LIFE+, and Interreg - Territorial Cooperation. The latter may contribute significantly to the conservation goas identified.

Human resources

MoE will also be responsible for allocating personnel for monitoring and competent authorities for MP implementation. Furthermore, the current MP should be integrated into the active FE MPs.

New Eco Patrol Law

Once the Eco Patrol Service initiates its activities in the project area, (according to the new Eco Patrol Service Law[110]), an information and training event should be organized on the overall MP objectives, the site importance, and MP measures. Attention must be given to specific protection management measures of the Action Plan such as control/eradication of illegal killing.

Ecosystem services

A SWOT[111] or ecosystems services feasibility study is also recommended in the future and is thus included in the Action Plan. Some of the study objectives will be to record the economy and ecosystem services within the site, deliver questionnaires to the locals about their income sources, and provide a SWOT analysis and feasibility report recommendation on the ecosystem services of the site under the particular conservation management practices and measures. A set of topics to be covered by the specific study could be how financially sustainable the ESMP is, how the major ecosystem services (for example, forest and pasturelands) and touristic activities are influenced and in what time span, what kind of financial incentives could be offered for ecosystem service changes under the MP scheme, how the income is improved, and so on.

Synergies

Site managers and site management authorities should continue to seek local, national, or international synergies for conservation and sustainable operations and future awareness and management activities and opportunities.

[110] https://www.arlis.am/DocumentView.aspx?DocID=186692
[111] SWOT = Strengths, weaknesses, opportunities, threats.

Monitoring, surveillance and observation recording

Monitoring conservation degree in relation to conservation objectives

The design and implementation of the degree monitoring procedure are proposed to be done by MoE together with the scientific community. Specific monitoring plans proposed for target species/habitats and a 10-year projection timetable are presented in the Action Plan table in Annex B.

Observation recording actions and their effects

Monitoring of management interventions[112]

No intervention management action is required.

Routine and event monitoring of the results

Specific monitoring plans proposed for target species/habitats and a 10-year projection timetable are presented in the Action Plan table in Annex B.

Plan review

The recommended validity period of the current plan is 10 years after which the MP should be revised and updated. Nevertheless, since the current plan is being developed as a pilot in Armenia, and a field biodiversity inventory of habitats and target species is planned, a midterm revision is required (in five years).

[112] 1.To assess if and how the implemented conservation measures are leading toward reaching conservation objectives for the site. 2. To assess the efficacy of employed conservation methods and approaches.

Communication, education, and awareness raising

During the implementation of communication, education, and awareness raising, a training/consultation meeting with local stakeholders was undertaken in mid-March 2024 for a broad and open public engagement. The local views were considered during the current MP review and finalization. The discussion results are briefly presented in this chapter. Further communication, education, and awareness raising activities are proposed in the Action Plan.

Meeting agenda review

The meeting commenced with a greeting to all stakeholders and an explanation of the meeting's purpose: to present and discuss the advancement of the Emerald Network in Armenia and new MP for the Ijevan site. The project team provided a detailed presentation explaining the overview of the project and Emerald Network and key components of the plan, including specific protected objects, conservation objectives, conservation measures, monitoring plan, and community engagement initiatives.

Figure 16. Some of the participants engaging in the conversation

Source: World Bank

Overview of participants

A total of 25 participants from the following organizations were present:

- MoE (Hydrometeorology and Monitoring Center SNCO, Forest Policy Department, Specially Protected Areas of Nature and Biodiversity Policy Department),
- Environmental Project Implementation Unit
- Sevkar FE
- Ijevan FE
- Eco Patrol Service – Sevkar and Ijevan Departments
- Tavush Regional Administration
- Kirants community
- Gandzaqar community
- Lusadzor community
- Getahovit community
- Ijevan community

- Aknaghbyur community
- Sarigyugh community
- Civil Youth Center NGO
- Institute of Botany after A. Takhtajyan NAS RA.

Figure 17. Experts discussing the key components and protective objects

Source: World Bank

Discussion session

Stakeholders actively participated in the discussion, sharing their insights, concerns, and suggestions regarding various aspects of the MP. Topics of discussion included habitat and species conservation and management options, monitoring activities, governance structure, stakeholder engagement, and resource allocation.

Key points raised by stakeholders included the importance of balancing conservation efforts with socioeconomic development, harmonizing activities for management of the Emerald site and management of FEs, including state sanctuaries, and ensuring inclusivity in decision-making processes.

Figure 18. Participants engaging in the discussion

Source: World Bank

Closing remarks

Closing remarks were delivered by Alla Aleksanyan. She expressed gratitude to participants for the constructive discussion and acknowledged the challenges discussed. All participants reiterated their commitment to collaborative efforts in conserving and managing the Emerald Network site effectively.

Figure 19. Alla Aleksanyan delivering the closing remarks

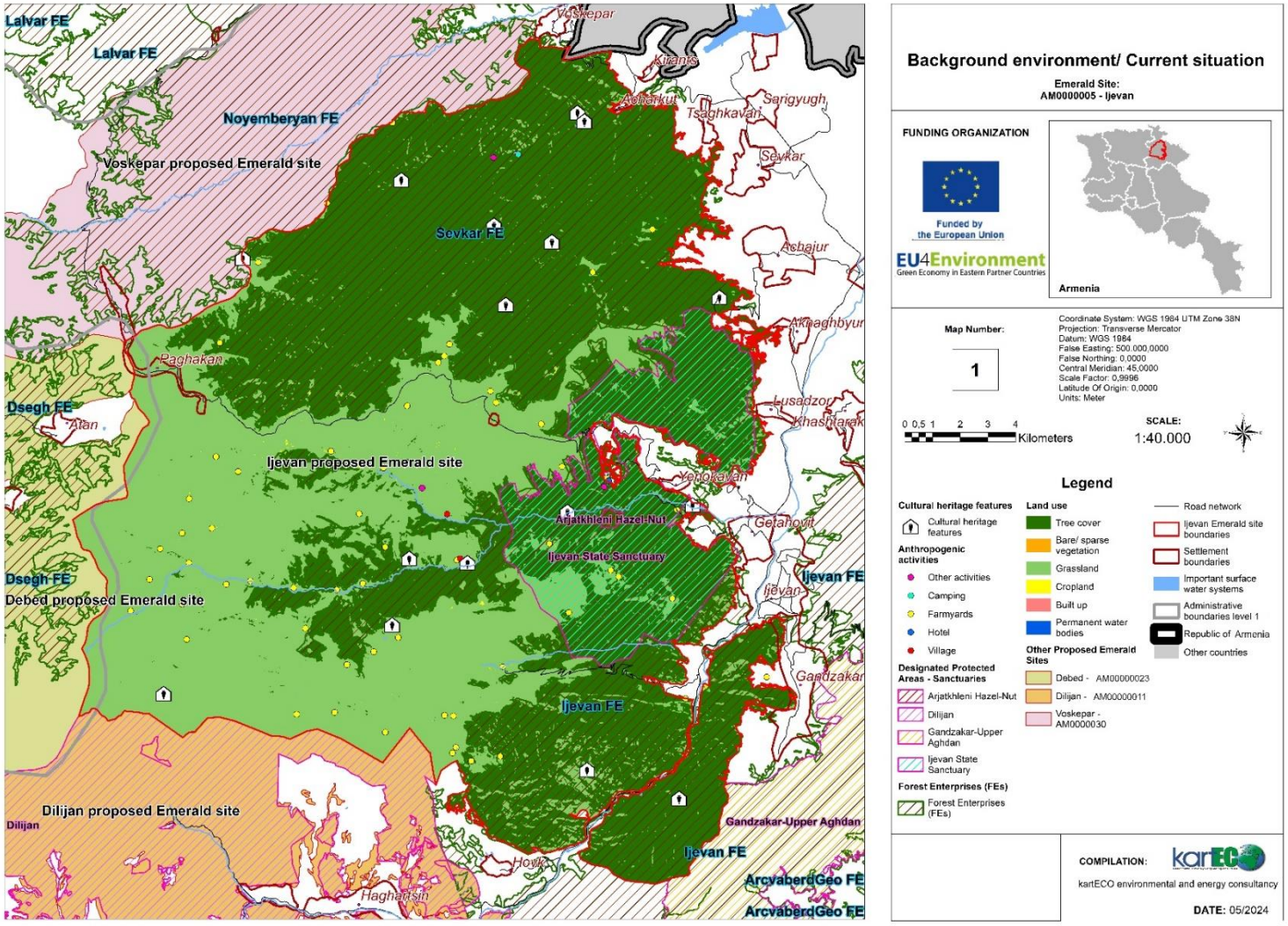
Source: World Bank

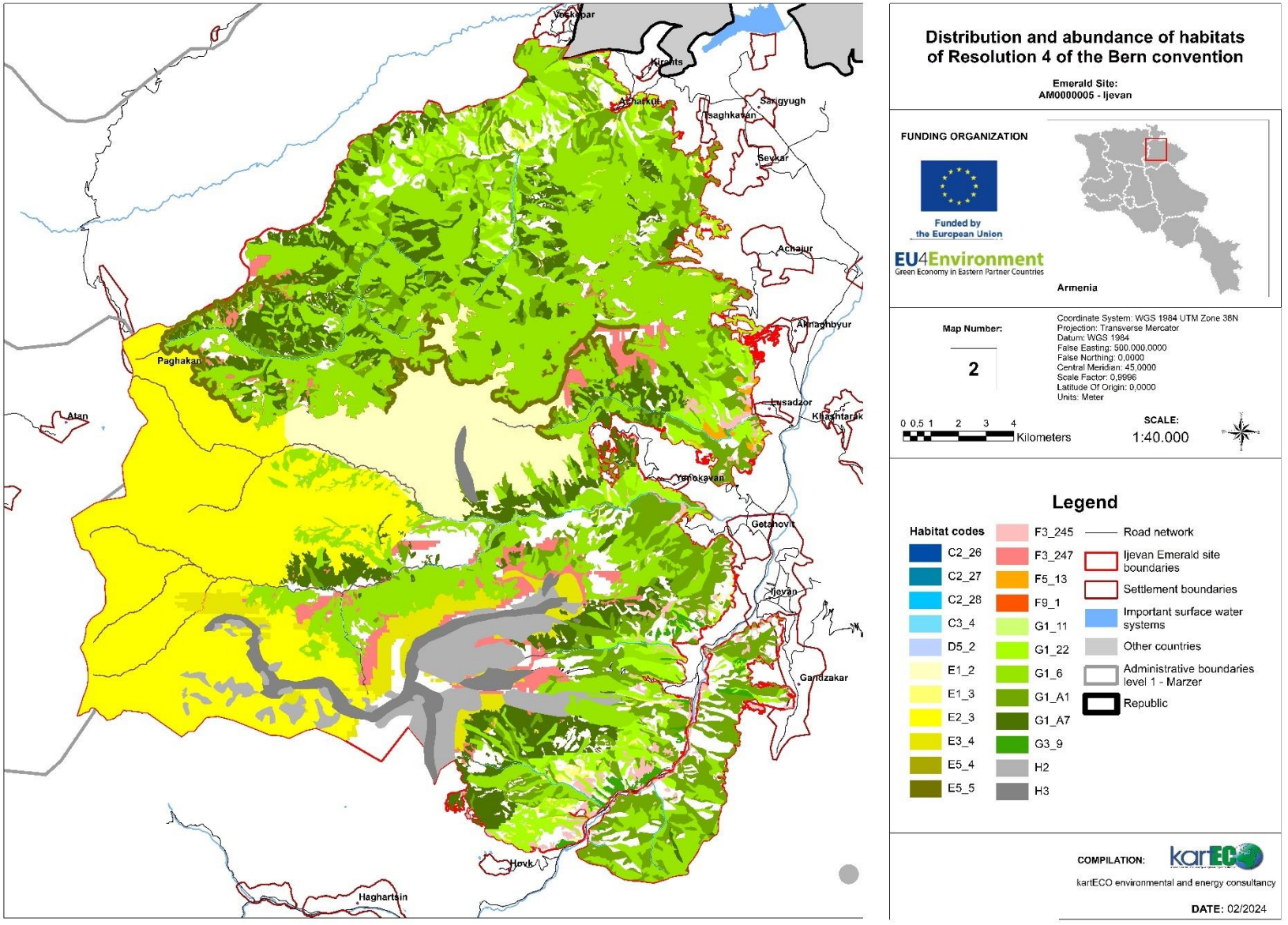
Follow-up and next steps

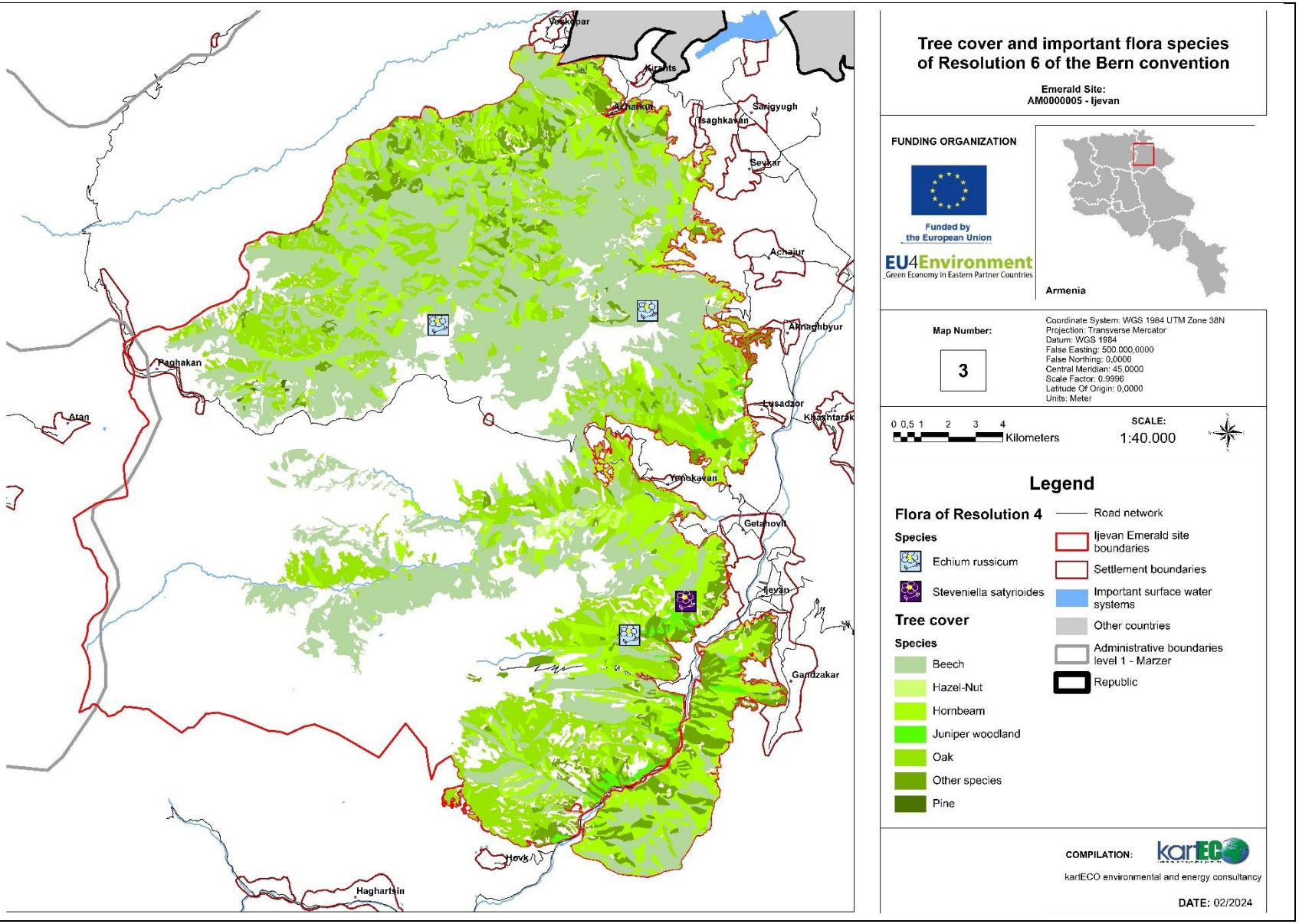
Following the discussion, the project team expressed its appreciation for the valuable feedback provided by stakeholders. Team Leader Alla Aleksanyan mentioned that all comments and inputs from different stakeholders would be incorporated into the final version of the MP, and further consultations would be conducted with relevant parties. Additionally, Bern Convention Focal Point mentioned about further steps and efforts coordinated by MoE for establishment and advancement of the Emerald Network in Armenia.

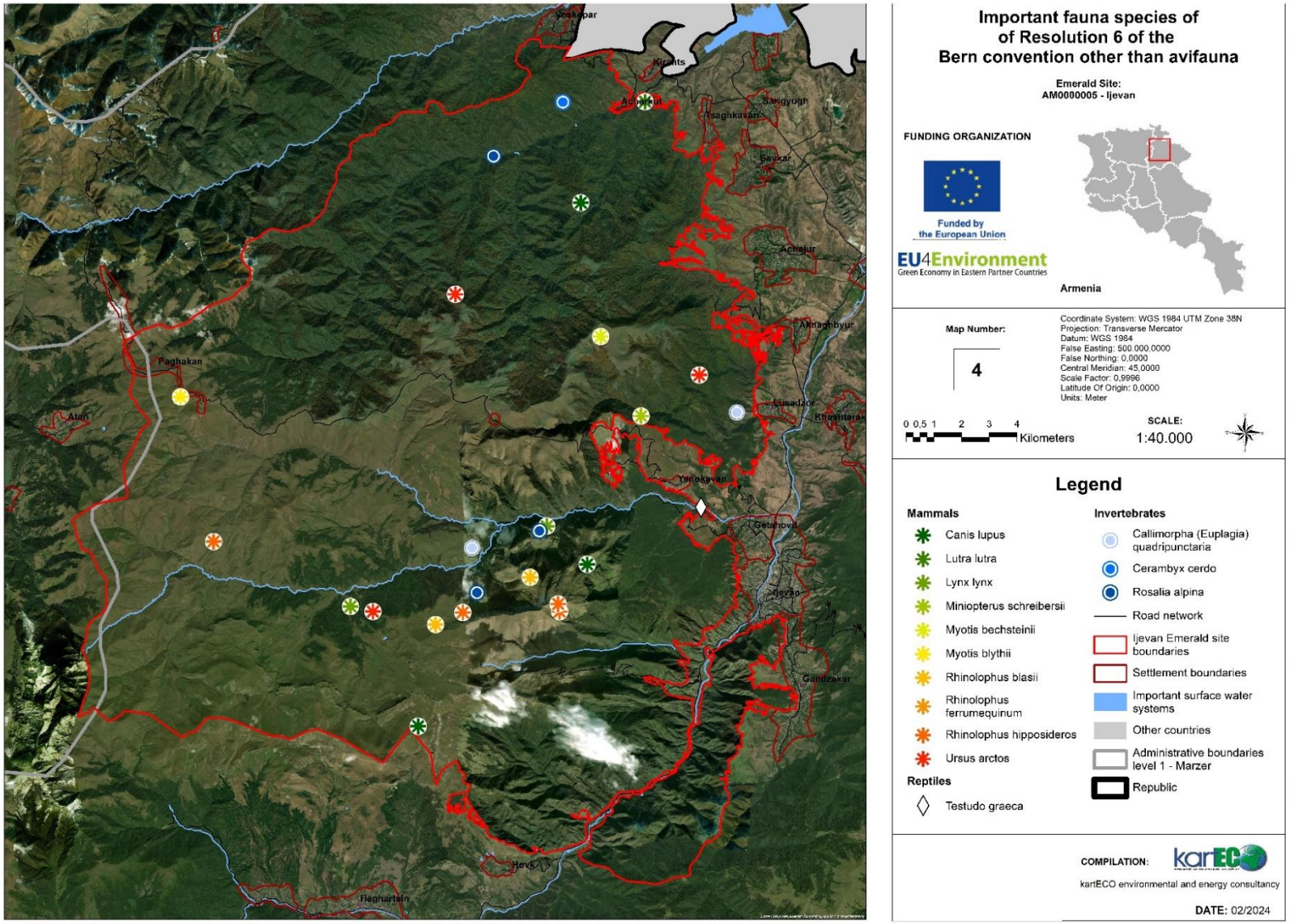
In response to the discussion and challenges of balancing conservation efforts with socioeconomic development, the Action Plan has included two necessary studies, that is, (a) to develop and implement a 10-year Sustainable Grazing Management Plan of the Ijevan Emerald site including livestock economy assessment of the area and (b) to develop a feasibility and SWOT analysis of the ecosystem services of the Ijevan Emerald site. Details are provided in the Action Plan.

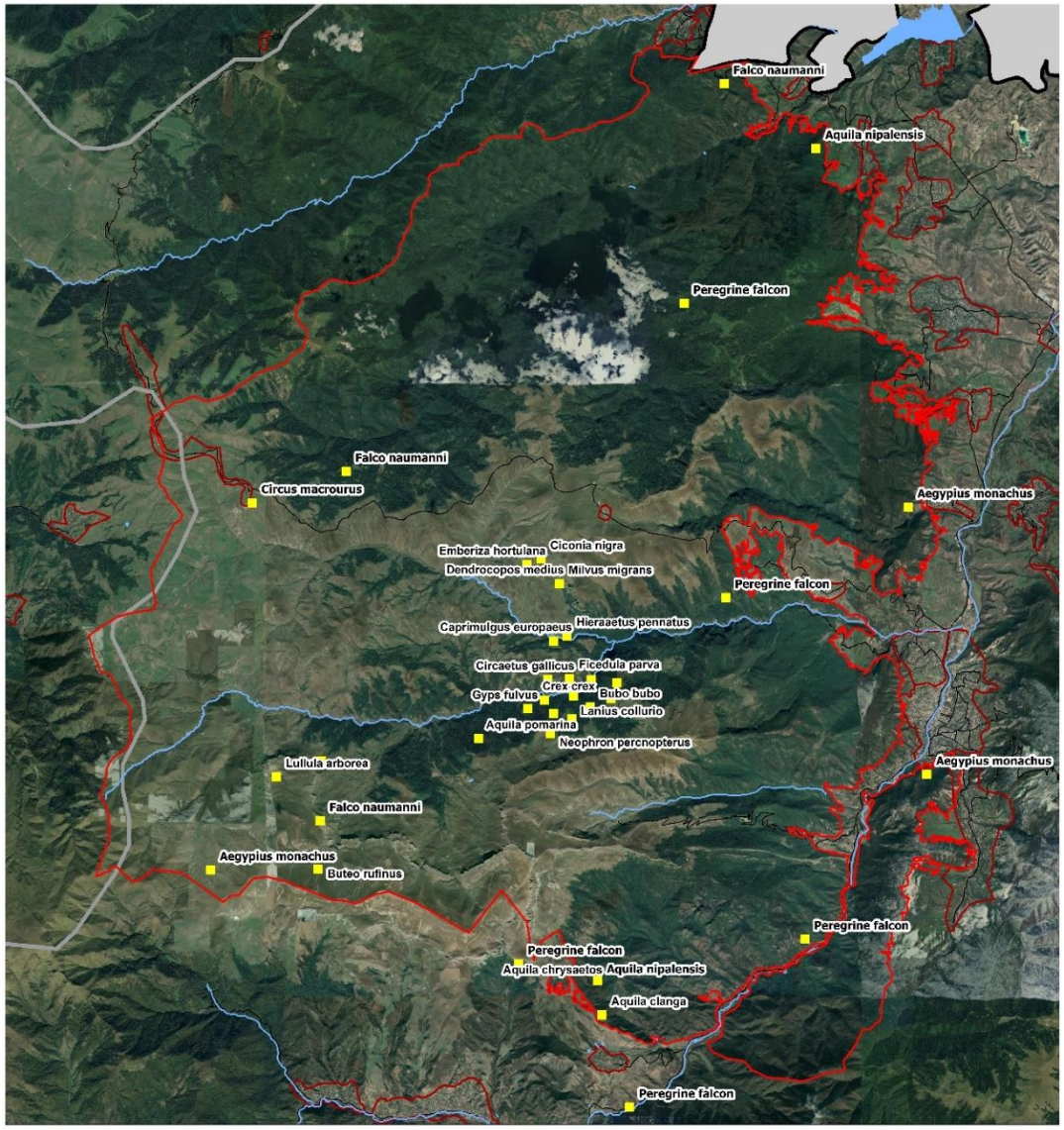
Annex A: Thematic Maps

N	Map name	Map
1	Background environment / Current situation	

2	Distribution and abundance of habitats of Resolution 4 of the Bern convention	

3	Tree cover and important flora species of Resolution 6 of the Bern Convention	

4	Important fauna species of Resolution 6 of the Bern Convention other than avifauna	

5	Important avifauna species of Resolution 6 of the Bern Convention	

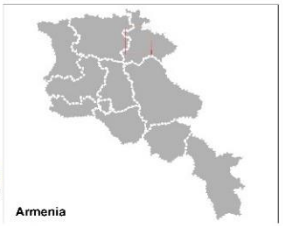
Important avifauna species of Resolution 6 of the Bern convention

Emerald Site:
AM0000005 - Ijevan

FUNDING ORGANIZATION

Funded by the European Union

EU4Environment
Green Economy in Eastern Partner Countries



Map Number:

5

Coordinate System: WGS 1984 UTM Zone 38N
Projection: Transverse Mercator
Datum: WGS 1984
False Easting: 500.000,0000
False Northing: 0,0000
Central Meridian: 45,0000
Scale Factor: 0,9996
Latitude Of Origin: 0,0000
Units: Meter

0 0,5 1 2 3 4 Kilometers

SCALE: 1:40.000

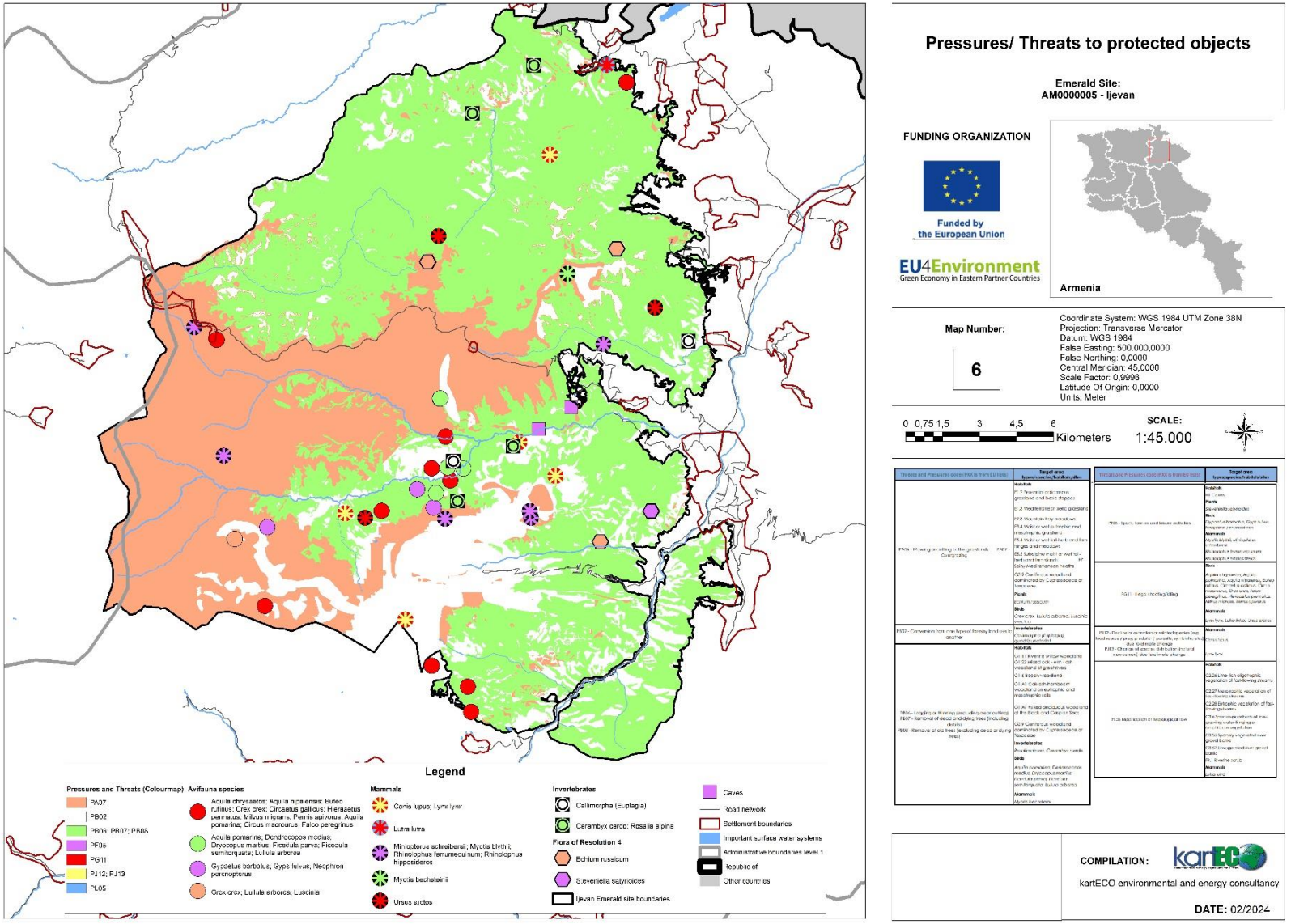
Legend

Avifauna species
- Confirmed sightings
- Road network
- Ijevan Emerald site
- Settlement boundaries
- Important surface water
- Other countries
- Administrative boundaries level
- Republic of

COMPILATION: kartECO

kartECO environmental and energy consultancy

DATE: 02/2024

6	Pressures/ Threats to protective objects	

Pressures/ Threats to protected objects

Emerald Site:
AM0000005 - Ijevan

FUNDING ORGANIZATION

Funded by the European Union

EU4Environment
Green Economy in Eastern Partner Countries

Map Number:

6

Coordinate System: WGS 1984 UTM Zone 38N
Projection: Transverse Mercator
Datum: WGS 1984
False Easting: 500.000,0000
False Northing: 0,0000
Central Meridian: 45,0000
Scale Factor: 0,9996
Latitude Of Origin: 0,0000
Units: Meter

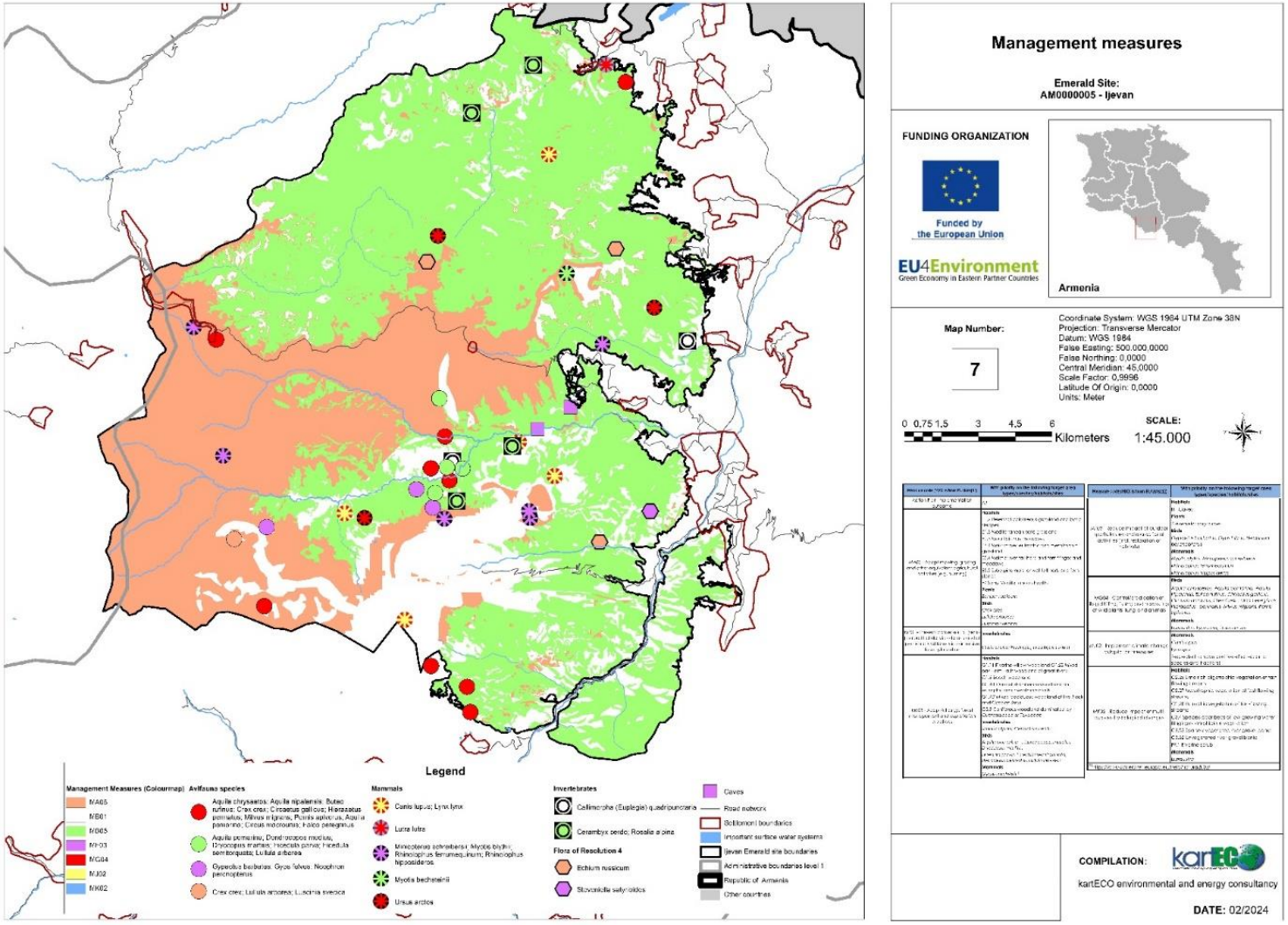
0 0,75 1,5 3 4,5 6 Kilometers

SCALE: 1:45.000

COMPILATION: kartECO

kartECO environmental and energy consultancy

DATE: 02/2024

7	Management measures	

Source: developed by kartECO for the World Bank.

Annex B: Action Plan Framework with Allocated Activities

Ref. code	Measure code (MXX is from EU lists[113])	With priority on the following target area types/species/habitats/sites	Short description of measure[114]	Monitoring indicator	Period/Year	Responsible
ACTIONS FOR PROTECTION AND MANAGEMENT						
1-0	Action Plan implementation outcome	All	Overall outcome indicators of the Action Plan implementation and need assessment of adaptations.	Conservation objectives of habitat and species (Tables 19, 20, 21, 22, 23)	The values of 2024 will be assessed based on the results of the next midterm report	MoE
1-1	MA05 - Adapt mowing, grazing and other equivalent agricultural activities (e.g. burning)	Habitats E1.2 Perennial calcareous grassland and basic steppes E1.3 Mediterranean xeric grassland E2.3 Mountain hay meadows E3.4 Moist or wet eutrophic and mesotrophic grassland E5.4 Moist or wet tall-herb and fern fringes and meadows E5.5 Subalpine moist or wet tall-herb and fern stands F7 Spiny Mediterranean heaths Plants *Echium russicum* Birds *Crex crex* *Lullula arborea* *Luscinia svecica*	Adapting the frequency, methods used, and/or the timing of mowing/cutting of grasslands or grazing by livestock to maintain/improve habitats or avoid damage to species (for example, nesting birds). This also includes the adaptation and management of other equivalent activities (for example, burning), for example, converting intensively managed grasslands into more extensive ones or reducing trampling by livestock.	Total area covered habitats E -Grasslands and lands dominated by forbs, mosses, or lichens = 14,590 ha (Consult Annex A maps)	As proposed by the 10-year Sustainable Grazing Management Plan of the Ijevan Emerald site (see point 4-3 for details)	MoE Assess possible integration with the new Eco Patrol Service[115]
1-2	MB01 - Prevent conversion of (semi-) natural habitats into forests and of (semi-) natural forests into intensive forest plantation	Invertebrates *Callimorpha (Euplagia) quadripunctariat*	Preventing the conversion of natural and seminatural habitats, as well as habitats of species targeted by the nature directives, into forest (for example, afforestation), preventing the conversion of natural and seminatural forests into intensive forest plantations or monocultures.	Afforestation, intensive forest plantation = 0 ha	Whole period	MoE-Armforest - Assess possible integration with the new Eco Patrol Service[116]

[113] https://c1-0-5dr.eionet.europa.eu/help/natura2000/
[114] https://cdr.eionet.europa.eu/help/natura2000/
[115] https://www.arlis.am/DocumentView.aspx?DocID=186692
[116] https://www.arlis.am/DocumentView.aspx?DocID=186692

1-3	MB05 - Adapt/change forest management and exploitation practices	Habitats G1.11 Riverine willow woodland G1.22 Mixed oak - elm - ash woodland of great rivers G1.6 Beech woodland G1.A1 Oak-ash-hornbeam woodland on eutrophic and mesotrophic soils G1.A7 Mixed deciduous woodland of the Black and Caspian Seas G3.9 Coniferous woodland dominated by *Cupressaceae or Taxaceae* Invertebrates *Rosalia alpina, Cerambyx cerdo* Birds *Aquila pomarina, Dendrocopos medius, Dryocopus martius,* *Ficedula parva, Ficedula semitorquata, Hieraaetus pennatus, Lullula arborea* Mammals *Myotis bechsteini*	Adapting or changing forest management and exploitation practices to preserve or restore habitats/habitats of species targeted by the nature directives or avoid species disturbance. This can involve adapting and changing management practices to secure or develop old stocks of trees, to maintain coppices, to retain dead and dying trees and stumps, to favor opening of closed woodlands, to preserve or restore habitat continuity, to manage species composition, and to prevent forest wildfires as well as adapting the time and duration of forestry activities to avoid disturbance of species. However, this excludes the management of drainage and irrigation, which are included under MB14. For target bird species, logging of any sort (legal sanitary or illegal) must be excluded in the areas especially in the spring to minimize disturbance and impact on nesting species.	Area under adaptation management to preserve or to restore habitats for species targeted, specifically habitats G - Woodland, forest, and other wooded land = 25,865 ha (see Annex A maps)	Every one or two forest exploitation practice periods	MoE-Armforest-Assess possible integration with the new Eco Patrol Service[117]
1-4	MF03 - Reduce impact of outdoor sports, leisure, and recreational activities (incl. restoration of habitats)	Habitats H1 Caves Plants *Steveniella satyrioides* Birds *Gypaetus barbatus, Gyps fulvus, Neophron percnopterus* Mammals *Myotis blythii, Miniopterus schreibersii* *Rhinolophus ferrumequinum* *Rhinolophus hipposideros*	Reducing the impact of outdoor sports, leisure, and recreational activities (for example, camping, skiing, mountaineering, boating, wildlife watching bird, and whale watching) on terrestrial, freshwater, and marine habitats and species and managing these activities. Also includes restoration of habitats affected by outdoor sports, leisure, and recreational activities (excludes measures addressing changes in hydrological and coastal systems and regimes for construction and development, which should be reported under MF08). Limit visits by tourists to the nesting colonies of vulture.	Number of tourists	Breeding period	MoE-Armforest-Assess possible integration with the new Eco Patrol Service[118]

[117] https://www.arlis.am/DocumentView.aspx?DocID=186692
[118] https://www.arlis.am/DocumentView.aspx?DocID=186692

1-5	MG04 - Control/eradication of illegal killing, fishing and harvesting of wild plants, fungi and animals	Birds *Aquila chrysaetos, Aquila pomarina, Aquila nipalensis, Buteo rufinus, Circaetus gallicus, Circus macrourus, Crex Crex, Falco peregrinus, Hieraaetus pennatus, Milvus migrans, Pernis apivorus* Mammals *Lutra lutra, Lynx Lynx, Ursus arctos*	Controlling, through enforcement, the illegal killing, fishing, and harvesting of fish, shellfish, plant species, or fungi, including the use of illegal methods or the taking protected species.	Number of illegal activities	Whole period	MoE-Armforest-Assess possible integration with the new Eco Patrol Service[119]
1-6	MJ02 - Implement climate change adaptation measures	Mammals *Canis lupus* *Lynx lynx* (expected to have positive effected on all species and habitats)	Implementation of specific climate change adaptation measures to address specific pressures on habitats and species (for example, managing an interconnected network of habitats/protected areas, to facilitate the adaptive dispersal of key species in the context of shifts in suitable 'climate envelopes').	Area under climate change adaptation	Case specific	MoE-Armforest-Assess possible integration with the new Eco Patrol Service[120]
1-7	MK02 - Reduce impact of multi-purpose hydrological changes	Habitats C2.26 Lime-rich oligotrophic vegetation of fast-flowing streams C2.27 Mesotrophic vegetation of fast-flowing streams C2.28 Eutrophic vegetation of fast-flowing streams C3.4 Species-poor beds of low-growing water-fringing or amphibious vegetation C3.55 Sparsely vegetated river gravel banks C3.62 Unvegetated river gravel banks F9.1 Riverine scrub Mammals *Lutra lutra*	Reducing the impact of landfilling, removal of sediments, canalization, water deviation, flooding regime modification, and other modifications of hydrological functioning or physical characteristics of water bodies, which cannot be easily associated with one of the categories above.	Record adverse human activities in hydrological basin of the site. Consult Annex A maps number 2, 4	Whole period	MoE-Armforest-Assess possible integration with the new Eco Patrol Service[121]
ACTIONS FOR MONITORING AND REVIEW						
2-1	Field inventory and monitoring program	For habitats (it is also important to consider using target species as indicators for future monitoring of the health of specific habitat. Some species are enough to be used as a representative indicator species in their respective habitats, for example, grasslands as a habitat of Luscinia svecica, Lullula, arborea or Crex crex)	Field inventory and monitoring program	Number of programs executed	Every 5 to 6 years	MoE

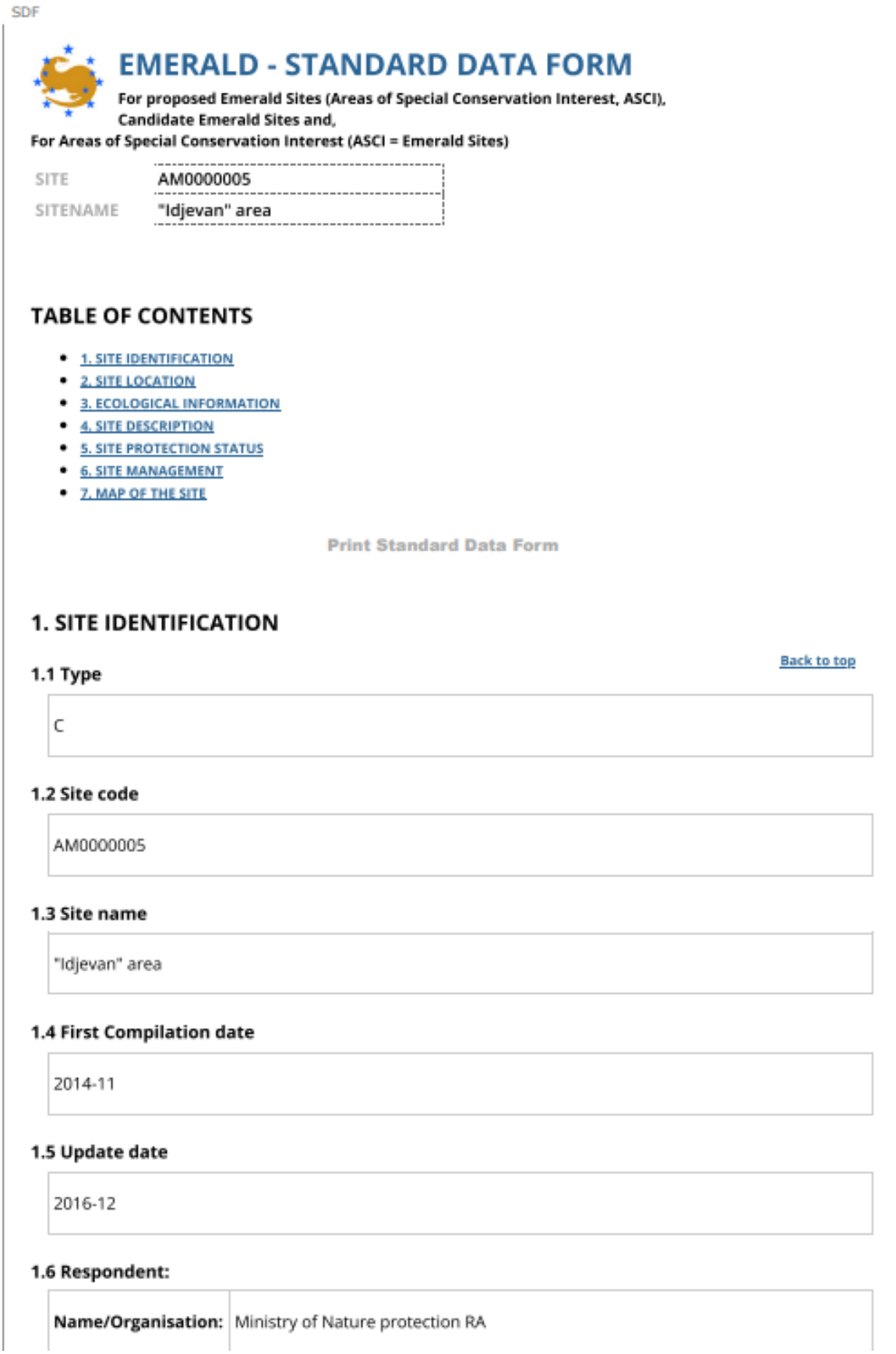
[119] https://www.arlis.am/DocumentView.aspx?DocID=186692
[120] https://www.arlis.am/DocumentView.aspx?DocID=186692
[121] https://www.arlis.am/DocumentView.aspx?DocID=186692

2-2	Field inventory and monitoring program	For all target plants and species	Field inventory and monitoring program	Number of programs executed	Every 5 to 6 years and/or target species specific	MoE
2-3	Fish stock	Lutra lutra	Fish stock depletion level	Number of programs executed	Once	MoE
2-4	Birds (the particular site is challenging in terms of its relief and accessibility and a comprehensive monitoring of all target species, for example, avifauna, is difficult considering the technical resources available in the country. Therefore, the proposed monitoring plan allows for species-specific monitoring.)	*Aquila pomarina, Dendrocopos medius, D. martius,* Booted eagle, and so on	(a) Monitor the population size and density of species that are practical indicators of 'mature forest' ecosystem (woodpecker guild and *A. pomarina*[122]). (b) Research limiting factors in the breeding period	Monitoring area covered	Every 5 to 6 years/end of March to end of September	MoE
		Gyps fulvus	Monitor the population size of endangered species in the breeding period and their changes in trends.	Monitoring area covered	Every 5 to 6 years/early March to end of July	MoE
2-5	Midterm MP review	—	—	—	Midterm (fifth year)	MoE
ACTIONS FOR COMMUNICATION/AWARENESS						
3-1	Stimulate involvement in decision-making and/or in implementation processes	Local stakeholder and local pastoralist, farmers, and other businesses, for example, tourism operators	Local awareness campaigns	Number of open discussion events	Whole period	MoE and local administration
3-2	Raising awareness campaigns	Local schools		Number of campaigns		
3-3	Develop specific educational program for capacity building to be applied at local schools					
3-4	Ecological summer camp for school kids					
3-5	New Eco Patrol Service/Set of information and training events	Emerald site	Once the Eco Patrol Service initiates its activities in the project area, an information and training event should be organized on the overall MP objectives, the site importance and MP measures, possible challenges, and so on. Attention must be given to specific protection management measures of the Action Plan such as control/eradication of illegal killing.	Number of events	Whole period	MoE-Armforest-Eco Patrol Service
3-6	Local SNCO	Emerald site FEs	SNCO officers should be informed on the overall MP objectives, the site importance and MP measures,	Number of events	Whole period	MoE-Armforest-

[122] LSE is not a specialist species of mature forests, but it inhabits structurally diverse forests, including mature forests. In Northern Armenia it is observed over old growth forests, which is a source of alternative prey when the abundance of prey decreases in open areas. Forestry operations have a negative and critical impact on LSE.

			possible challenges, and so on. Attention must be given to the proposed corrective measures applied during the FE MP implementation.			Eco Patrol Service
			OTHER			
4-1	SDF update	Emerald site	SDF update	—	—	MoE
4-2	Pilot application	Invertebrates	A pilot application proposed is the registration of trees suitable for development of xylophagous species as the objects of control and conservation, with further observation on their use by target species—included in the FE MPs.	Number of pilot applications	Case specific	MoE
4-3	Develop and implement a 10yr Sustainable Grazing Management Plan of the Ijevan Emerald site	Meadow, grassland habitat of the Emerald site and target species of meadow, grassland habitats, for example, Lullula arboela	The Grazing Management Plan should include at least a grazing plan program for the Emerald site area (for example, grazing frequency, pasture productivity), taking into account the possible impacts and conservation conflicts among target features (habitats, species, plants) and measures proposed in the Emerald site MP For sensitive avifauna species such as Lullula arboela, management recommendations need to take into account the local/regional context (factors such as vegetation cover, its height). Note: Target species conservation should be part of the grazing management aspect ONLY IF solid ecological data are gathered. Measures such as rotational grazing may even negatively affect other species in that habitat. Thus, it is a matter of local ecological research first. Also consider using target species as indicators for future monitoring (see 2-1 above)	Number of plans/programs executed	Once	MoE
4-4	Feasibility and SWOT analysis of the ecosystem services of the Ijevan Emerald site (Socioeconomic study)	Emerald site	Prepare an ecosystem services SWOT and feasibility analysis. The study objective will be to record the economy and ecosystem services within the site (forest products, non-wood products, tourisms, pasture productivity, livestock economy, and so on), deliver questionnaires to the locals about their income sources, and provide a SWOT analysis and feasibility report recommendation on the ecosystem services of the site under the proposed and current conservation management scheme.	Number of plans/programs executed	Once	MoE

Annex C: SDF for Emerald Site AM0000005 'Ijevan' Area[123]



SDF

EMERALD - STANDARD DATA FORM

For proposed Emerald Sites (Areas of Special Conservation Interest, ASCI), Candidate Emerald Sites and,
For Areas of Special Conservation Interest (ASCI = Emerald Sites)

SITE	AM0000005
SITENAME	"Idjevan" area

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Print Standard Data Form

1. SITE IDENTIFICATION

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1.1 Type

C

1.2 Site code

AM0000005

1.3 Site name

"Idjevan" area

1.4 First Compilation date

2014-11

1.5 Update date

2016-12

1.6 Respondent:

Name/Organisation:	Ministry of Nature protection RA

[123] https://natura2000.eea.europa.eu/Emerald/SDF.aspx?site=AM0000005

1.7 Site indication and designation / classification dates

Classification	Data
Date site proposed as ASCI (Emerald):	2014-11
Date site accepted as candidate ASCI (Emerald):	No data
Date site designated as ASCI (Emerald):	No data
Date site accepted as ASCI (Emerald):	No data
National legal reference of ASCI designation:	No data

2. SITE LOCATION

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2.1 Site-centre location [decimal degrees]:

Longitude	45.095600
Latitude	40.876100

2.2 Area [ha]

47593.1000

2.3 Marine area [%]

0.0000

2.4 Sitelength [km]:

0.00

2.5 Administrative region code and name

NUTS level 2 code	Region Name
AM10	Tavush marz

2.6 Biogeographical Region(s)

Alpine	(100.00 %)

3. ECOLOGICAL INFORMATION

Resolution 4 Habitat type						Site assessment			
Code	PF	NP	Cover [ha]	Cave [number]	Data quality	A|B|C|D	A|B|C		
						Representativity	Relative Surface	Conservation	Global
G1.11			0	0.00	M	A	C	C	C
G1.22			0	0.00	M	A	B	C	C
G1.6			0	0.00	G	A	B	B	C
G1.A1			0	0.00	M	B	B	B	C
G1.A4			0	0.00	M	A	B	B	C
G1.A7			0	0.00	G	A	B	B	C
G3.4E			0	0.00	G	A	B	C	C
G3.9			0	0.00	M	B	C	C	C
H1			0	1.00	G	B	C	C	C
H2.4			0	0.00	M	B	C	C	C
H3.2			0	0.00	G	A	B	C	C

PF: for the habitat types that can have a non-priority as well as a priority form (6210, 7130, 9430) enter "X" in the column PF to indicate the priority form.

NP: in case that a habitat type no longer exists in the site enter: x (optional)

Cover: decimal values can be entered

Caves: included in habitat types A1.44, A3, A4 and H1: enter the number of caves if estimated surface is not available.

Data quality: G = "Good" (e.g. based on surveys); M = "Moderate" (e.g. based on partial data with some extrapolation); P = Poor (e.g. rough estimation)

3.2 Species listed in Resolution 6 and site evaluation for them

Species					Population in the site						Site assessment			
Group	Code	Scientific Name	S	NP	Type	Size		Unit	Cat.	Data quality	A|B|C|D	A|B|C		
						Min	Max		C/R/V/P		Pop.	Con.	Iso.	Glo.
M	1352	Canis lupus			p	0	0		C		C	C	C	C
B	A224	Caprimulgus europaeus			r	20	30	p	R		B	C	C	C
I	1088	Cerambyx cerdo			p	0	0		C		B	C	C	C
B	A122	Crex crex			r	12	21	p	R		B	C	C	C
B	A238	Dendrocopos medius			r	7	12	p	R		C	C	C	C
P	4067	Echium russicum			p	500	2000	adults	C		B	C	C	C

Species					Population in the site						Site assessment			
Group	Code	Scientific Name	S	NP	Type	Size		Unit	Cat.	Data quality	A|B|C|D	A|B|C		
						Min	Max		C/R/V/P		Pop.	Con.	Iso.	Glo.
B	A379	Emberiza hortulana			r	25	40	p	R		B	C	C	C
R	1220	Emys orbicularis			p	0	0		V		C	C	C	C
I	6199	Euplagia quadripunctaria			p	0	0		C		B	C	C	C
B	A320	Ficedula parva			r	50	100	p	C		C	C	C	C
B	A442	Ficedula semitorquata			r	35	50	p	R		B	C	C	C
B	A338	Lanius collurio			r	30	50	p	C		C	C	C	C
B	A272	Luscinia svecica			r	10	20	p	R		C	C	C	C
M	1355	Lutra lutra			p	0	0		R		B	C	C	C
M	1361	Lynx lynx			p	0	0		R		B	B	C	C
M	1310	Miniopterus schreibersii			p	0	0		C		B	C	C	C
M	1323	Myotis bechsteinii			p	0	0		C		A	B	C	C
M	1307	Myotis blythii			p	0	0		C		B	C	C	C
B	A346	Pyrrhocorax pyrrhocorax			r	5	10	p	R		C	C	C	C
M	1304	Rhinolophus ferrumequinum			p	0	0		R		C	C	C	C
M	1303	Rhinolophus hipposideros			p	0	0		C		B	C	C	C
I	1087	Rosalia alpina			p	0	0		R		A	C	C	C
P	2333	Stevenielia satyrioides			p	5	20	adults	V		A	B	A	C
R	1219	Testudo graeca			p	100	300	i	C		A	C	C	C
M	1354	Ursus arctos			p	0	0		R		C	C	C	C

Group: A =Amphibians, B = Birds, F = Fish, I = Invertebrates, M = Mammals, P =Plants, R = Reptiles

S: in case that the data on species are sensitive and therefore have to be blocked for any public access enter: yes

NP: in case that a species is no longer present in the site enter: x (optional)

Type: p=permanent, r=reproducing, c=concentration, w=wintering (for plant and non-migratory species use permanent)

Unit: i=Individuals, p=pairs or other units according to the standardised list of population units and codes, in accordance with Article 12 and 17 reporting under the Birds and Habitats Directives

Abundance categories (Cat.): C=common, R= rare, V=very rare, P=present – to fill if data quality are deficient (DD) or in addition to population size information

Data quality: G = 'Good' (e.g. based on surveys); M = 'Moderate' (e.g. based on partial data with some extrapolation); P = 'Poor' (e.g. rough estimation); DD = Data deficient (use this category only, if not even a rough estimation of the population size can be made, in this case the fields for population size can remain empty, but the field "Abundance categories" has to be filled in)

3.3 Other important species of flora and fauna

Species					Population in the site				Motivation						
Group	CODE	Scientific Name	S	NP	Size		Unit	Cat.	Species appendix			Other categories			
					Min	Max		C|R|V|P	I	II	III	A	B	C	D
P		Corylus colurna			500	700	i	R				X			
I		Ctenicera pectinicornis			0	0		R				X			
R		Darevskia praticola			0	0		R				X			
M		Felis silvestris			0	0		R				X			
P		Galanthus alpinus			500	1000	i	R							
P		Galanthus artjuschenkoae			1000	2000	i	R							
I		Isomira armena			0	0		R							

Group: A =Amphibians, B = Birds, F = Fish, Fu = Fungi, I = Invertebrates, L = Lichens, M = Mammals, P =Plants, R = Reptiles

CODE: for Appendix I, II and III species the code provided in the Emerald reference portal should be used, in addition to the scientific name

S: in case that the data on species are sensitive and therefore have to be blocked for any public access enter: yes

NP: in case that a species is no longer present in the site enter: x (optional)

Unit: i = Individuals, p=pairs or other units according to the standardised list of population units and codes, in accordance with Article 12 and 17 reporting under the Birds and Habitats Directives.

Cat.: Abundance categories: C=common, R= rare, V=very rare, P=present

Motivation categories: I, II, III: Appendix Species (Bern Convention), **A:** National Red List data; **B:** Endemics; **C:** International Conventions; **D:** other reasons

4. SITE DESCRIPTION

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4.1 General site character

Habitat class	% Cover
N16	88.00
N19	1.00
N09	5.00
N22	1.00
N08	5.00
Total Habitat Cover	100

Other Site Characteristics

About 90% of area - forests (oak and beech).Inside of the area there is a reserve of Corylus colurna - grove inside the beech forest.

4.2 Quality and importance

In the site forests are in good condition, there is only grove of Corylus colurna in Armenia.There are about 150 species of endemic of different rank, and about 100 species included in the Red Data Book of

Designated at national or regional level:

Type code	Site name	Type	Cover [%]
AM03	"Idjevan" State sanctuart (including "Corylus colurna" State sanctuary)	=	50.00

Designated at international level:

Type	Site name	Type	Cover [%]
Other	"Idjevan" State sanctuart (including "Corylus colurna" State sanctuary)	=	50.00

6. SITE MANAGEMENT

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6.1 Body(ies) responsible for the site management:

Organisation:	"Hayantar" SNCO, Ministry of Agriculture RA
Address:	
Email:	

6.2 Management Plan(s):

An actual management plan does exist:

☐	Yes	
☐	No, but in preparation	
☒	No	

6.3 Conservation measures (optional)

The part of the site is state sanctuary, no additional measures exist

7. MAP OF THE SITE

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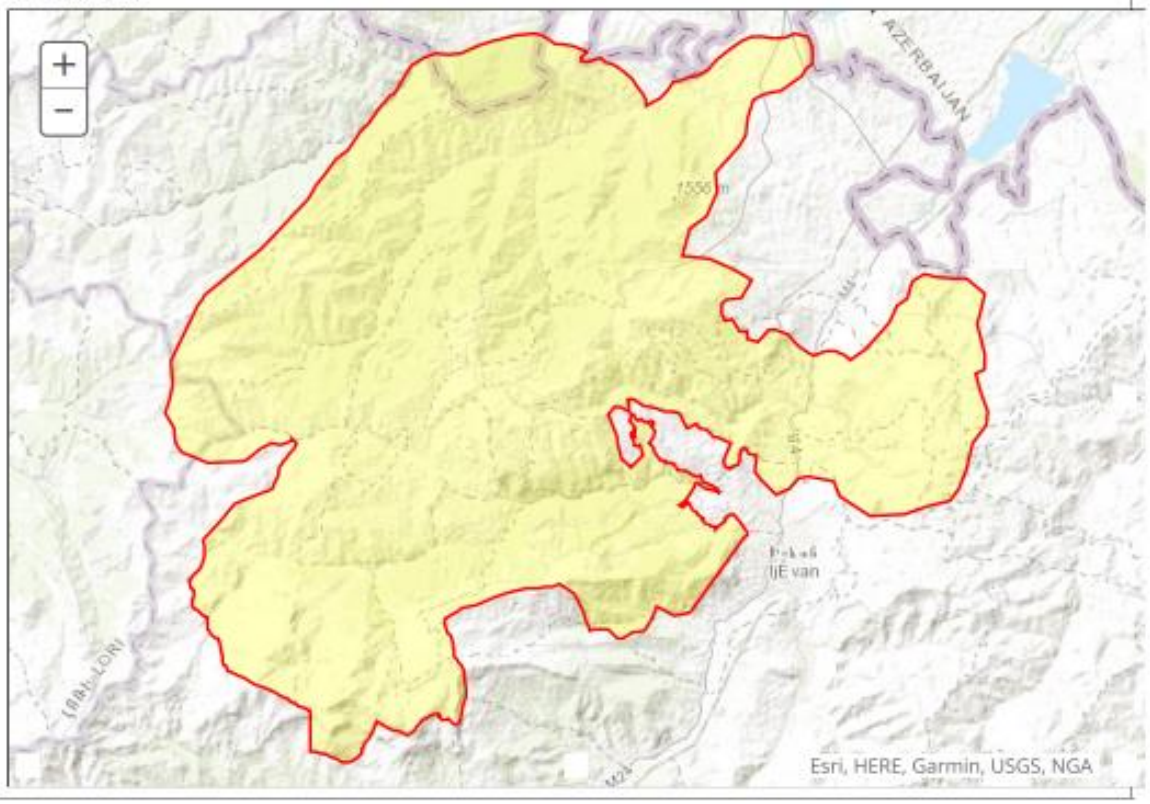
Map delivered as PDF in electronic format (optional)			
☐	Yes	☐	No

SITE DISPLAY



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Pilot Management Plan of the Emerald Site Ijevan (AM0000005) in Armenia

The Ijevan site represents a case study with low pressures and threats to target objects, a significant forest (and pasture) area under active management, and almost no human operations taking place. The current ESMP is based on the 2023–2024 Ijevan (AM0000005) recommended borders and revised list of species and habitats, under the EU4Environment Program.

The MP key components involve the conservation degree assessment and conservation objects status analysis. For specific habitats and species, the pressures and threats are further analyzed and respective management measures are proposed. The MP recommendations for a 10-year time span are presented through an Action Plan (Annex B). The Action Plan also includes a midterm evaluation report. The biodiversity information presented is mainly from desktop analysis with no specific field sampling/monitoring taking place (since 2016 for the needs of the current SDF— to be modified) but also includes new data from personal experts' field investigations (for example, for avifauna).

Finally, during the implementation of communication, education, and awareness raising, a training/consultation meeting with local stakeholders was undertaken in mid-March 2024 for a broad and open public engagement. The local views were considered during the current MP review and finalization. MoE is advised to consider reviewing, finalizing, and proceeding on approval of the current ESMP.

The current ESMP is a demonstration case for Armenia, applying a locally adopted EU-Natura 2000 MP method and similar code lists during assessing and presenting the site conservation degree, conservation objectives, and conservation measures.

Programme website:

www.eu4environment.org

Action implemented by:

OECD BETTER POLICIES FOR BETTER LIVES | UNECE | UN environment programme | UNIDO | THE WORLD BANK IBRD • IDA | WORLD BANK GROUP | karEC