Finnish Environment Institute SYKE, Finland

Annex for the Management Plan for Nature Monument Prespa Lake

Twinning Project MK 13 IPA EN 02 17

Strengthening the capacities for effective implementation of the acquis in the field of nature protection

Report D 1.1.-2

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The Ministry of Environment and Physical Planning, Department of Nature,
Republic of North Macedonia
Metsähallitus (Parks and Wildlife Finland), Finland
The State Service for Protected Areas (SSPA), Lithuania

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Contents

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Foreword

The Annex for the Management Plan for Nature Monument Prespa Lake (Annex) is prepared as a part of Twinning Project MK 13 IPA EN 02 17; "Strengthening the capacities for effective implementation of the acquis in the field of nature protection", where the project implementation period is 18.11.2017 – 17.11.2019.

Beneficiary of the project is the Ministry of Environment and Physical Planning (MoEPP), Department of Nature of the Republic of North Macedonia. EU Member state implementers are the Finnish Environment Institute; (Suomen ympäristökeskus, SYKE); Metsähallitus (Parks and Wildlife Finland) and the State Service for Protected Areas (SSPA), Lithuania. Among others, the aims of the project are to "Strengthen capacities for preparation of studies for valorisation of nature values" as well as to facilitate "Strengthened capacities for preparation of draft management plans for natural protected areas which are of national and EU interest for conservation (i.e. potential future Natura 2000 sites)".

"Nature Monument Prespa Lake" (Prespa Lake NM) was chosen as one of the target areas for the Twinning project. It has already been identified together with Ezerani Nature Park as a potential Natura 2000 site within the previous Natura 2000 project: "Strengthening the capacities for implementation of NATURA 2000 – EUROPEAID/136609/IH/SER/MK".

The Ezerani Nature Park has a valid management plan, but Prespa Lake NM does not have a valid management plan yet. The draft management plan for Prespa Lake NM was prepared together with the valorisation study, but the approval process is still pending. The preparation of the management plan has been based on existing national legislation, and does not fully satisfy the requirements of the EU Habitats and Birds Directives.

It was therefore decided, together with project team, the beneficiary MoEPP, and Resen municipality (representing the management authority of Prespa Lake NM), that the project team should prepare the Annex for a draft management plan for Nature Monument Prespa Lake. The focus of this Annex is on Natura 2000 habitats and species distribution, and their conservation needs. The Annex is prepared in a way that it in whole or parts could be integrated into the formal draft management plan, when this will be revised.

The Annex is based on habitats and species data collected during the implementation of Twinning project MK 13 IPA EN 02 17, "Strengthening the capacities for effective implementation of the acquis in the field of nature protection". Other information, collected during previous projects and studies, and referred to in literature, has also been used.

The structure of the Annex is mainly following the structure defined in the "Rulebook on the content of the management plans for the protected areas and annual programs for nature protection (2012)". In addition to habitats and species protected under Habitats Directive, special attention has also been given to invasive species in the area, because this type data has not been compiled before. Some of these species can alter ecosystems and need to be taken into account in management practices.

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1. Introduction

1.1. Name of the area, its legal base, administrative status

The target area for this Annex of Management Plan is Prespa Lake NM (corresponds to IUCN category III) with a total area of 17,788.61 hectares. However, the area covered in the strategy part of this document is corresponding to the whole potential Natura 2000 area, i.e. including Ezerani Nature Park. The Prespa Lake NM area has been designated by the Law on Proclamation of Prespa Lake for Monument of Nature (Official Gazette of the Republic of Macedonia no. 51/11, April 2011). The proclamation covers the part of the lake belonging to the Republic of North Macedonia, recognizing its natural beauties, geomorphological, hydrological and hydro-biological and other scientific values. The first protection of Prespa Lake was provided by the Law on Protection of Dojran, Ohrid and Prespa Lake, dating back to 1977.

Figure 1. Borders of Prespa Lake National Monument

The municipality of Resen is responsible for the management of the Prespa Lake NM, and this is executed by the Environmental Department at Resen municipality. The same unit is also in charge of the management of Ezerani Nature Park.

The area of Prespa Lake NM is bordering Ezerani Nature Park in the north, and was designated the category Nature Park (corresponding IUCN category IV) in 2012, covering an area of 1 917 ha. Even earlier, in 1996, the area was proclaimed as "Ornithological site Ezerani – strict nature reserve Ezerani" (corresponding IUCN Category 1a), (Official Gazette of the Republic of Macedonia No. 37/96). The area is also bordering National Park Galicica to the west (Official Gazette of the Republic of Macedonia No. 31/58), and Golem Grad island in the Prespa Lake which is a part of the National Park Galicica. The Prespa Lake NM has international borders with Prespa National Park in Albania to the west and south, and Prespa National Park in Greece (also belonging to Natura 2000 network: GR 1340001), to the south.

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International designations and initiatives

Prespa Lake was also declared, on 3th May 1995 with an area of 18,929 ha, the first Ramsar area in Macedonia. The Ramsar Convention on Wetlands of International Importance, especially as Waterfowl Habitats, is an international treaty for the conservation and sustainable use of wetlands. It is also known as the Convention on Wetlands.

Prespa Lake NM together with Ezerani Nature Park was identified as an Important Bird Area (IBA) area in 2010 covering an area of 19,842 ha. Identifications of IBA –sites is an initiative implemented by BirdLife International at a global level, aiming to conserve a network of sites of particular importance for bird conservation.

Prespa Lake area was also identified as an Important Plant Area (IPA) in 2010. This was an initiative of Plantlife International dating back to 1995. An IPA is a natural or semi-natural site exhibiting exceptional botanical richness and/or supporting an outstanding assemblage of rare, threatened and/or endemic plant species and/or vegetation of high botanic value.

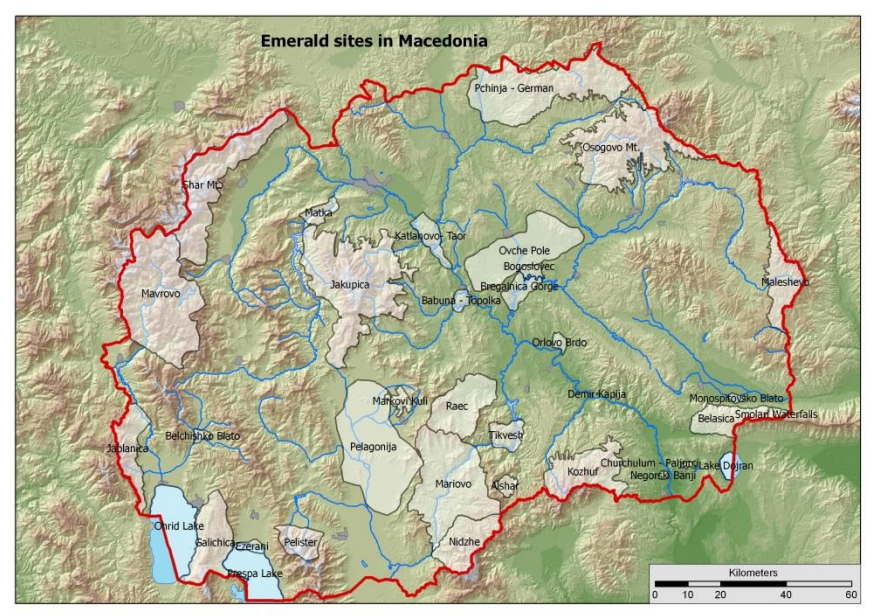

Figure 2. Emerald sites in Macedonia

Prespa Lake NM together with Ezerani Nature Park was identified as an Emerald site in 2010. The Emerald network is a network of areas of special conservation interest designated to preserve the network of natural habitats, and it is developed on the territory of the Parties to Bern Convention. The main motive behind the development of this network is to contribute to the ecological network Natura 2000 in countries that are not member states of the European Union, using as much as possible similar methodological approach. Furthermore, the area was identified as a potential Nature 2000 site in the project "Strengthening the capacities for implementation of NATURA 2000 – EUROPEAID/136609/IH/SER/MK", as Special Protected Area (SPA) area in 2016. SPA is a site identified by European Union Directive on the Conservation of Wild Birds (Council Directive 2009/147/EC) – Birds Directive.

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Transboundary designations and initiatives

The Prespa Park initiative dates back to year 2000, when the Prime Ministers of Greece, Albania and Macedonia signed the "Declaration on the Creation of the Prespa Park and the Environmental Protection and Sustainable Development of the Prespa Lakes and their Surroundings". It has been followed by the international "Agreement on the Protection and Sustainable Development of the Prespa Park Area", which received final approval by European Council of Ministers in 4th October 2011, and was ratified by the Macedonian Parliament in July 2012. In other countries the approval is still pending. Prespa Park Coordinative Committee has representatives from all three countries, covering governmental, municipal and non-governmental institutions. However, there are no permanent funding for the work of the coordinative committee, nor official code of conduct for the meetings and operations. Regardless, Prespa Park has been a successful platform for many projects mainly dealing with environmental issues.

The Ohrid-Prespa Biosphere Reserve was declared in 2014 by UNESCO Man and the Biosphere Programme, and includes the mountain Galicica, Ohrid and Prespa lakes, and comprises a balanced combination of water bodies and surrounding mountains bordered by flat areas on its external boundaries. The reserve covers an area of 446,244.52 hectares (386,915.21 ha terrestrial, 59,329.31 ha aquatic) in the Republic of North Macedonia and Albania. The Man and the Biosphere Programme is an intergovernmental scientific programme, launched in 1971 by UNESCO, aiming at establishing a scientific basis for the improvement of relationships between people and their environments.

Prespa Lake is also a part of The Balkan Green Belt Initiative, covering areas in the Republic of North Macedonia, Albania and Greece (figure 3). The vision of this initiative is to conserve and restore the shared natural heritage along the former iron curtain as an ecological network, connecting high natural values and cultural landscapes, while at the same time take into account economic, social and cultural needs of local communities. The Green Belt crosses 24 European countries (length of 12 500 km), starting from the Barents Sea up to the Black Sea and it is divided into three parts: the Fennoscandian, the Central European and the Balkan Green Belt.

Figure 3. The Green Belt in the Republic of North Macedonia

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1.2. Entity conducting the Annex of Management Plan

This Annex is prepared in scope of the Twinning project MK 13 IPA EN 02 17, "Strengthening the capacities for effective implementation of the acquis in the field of nature protection", by Finnish Environment Institute (Suomen ympäristökeskus, SYKE), Metsähallitus, Parks and Wildlife Finland and the State Service for Protected Areas (SSPA), Lithuania in cooperation with the Beneficiary of the project – the Ministry of Environment and Physical Planning (MoEPP), Department of Nature of the Republic of North Macedonia. Additionally, information and contribution has come from the projects implemented by EU/UNDP and PONT (Prespa Ohrid Nature Trust).

Within the Twinning project the following Finish and Lithuanian experts participated in the work:	
Expert	**Role and responsibility**
Arto Ahokumpu	Overall coordination
Rūta Baškytė	Main responsibility for compiling the plan
Arūnas Pranaitis	Management activities
Petri Ahlroth	Animals
Kimmo Syrjänen	Habitats, vascular plants, bats and fish
Arūnas Balsevičius	Habitats and vascular plants
Pekka Rusanen	Birds
Markku Mikkola-Roos	Birds

Additional data for the Twinning project was provided by local experts being involved in the projects funded by EU/UNDP and PONT (Prespa Ohrid Nature Trust):	
Expert	**Role and responsibility**
Vlado Matevski	Habitats and vascular plants
Renata Ćušterevska	Habitats and vascular plants
Dragan Arsovski	Reptiles and amphibians

2. Description of the area

2.1. General information

The Prespa Lake is located in the southern part of the Prespa Valley, and together these two entities represent a natural geographical unit (Figure 4). The Prespa Valley is located in the southwest part of the Republic of North Macedonia (approx. N 41 °, E 23 °). The eastern side is bordering the Pelagonija Valley, the western side the Ohrid Valley. The northern parts has borders with the valleys of Ohrid and Demir Hisar, and to the south it borders the valleys of Kostur, Bilisthanska and Korchanska (Gorichka).

The whole Prespa Valley is part of three international administrative units: the Municipality of Resen in the RNM, the Prespes Municipality in Greece, and the municipalities Pustec and Bilisht in Albania.

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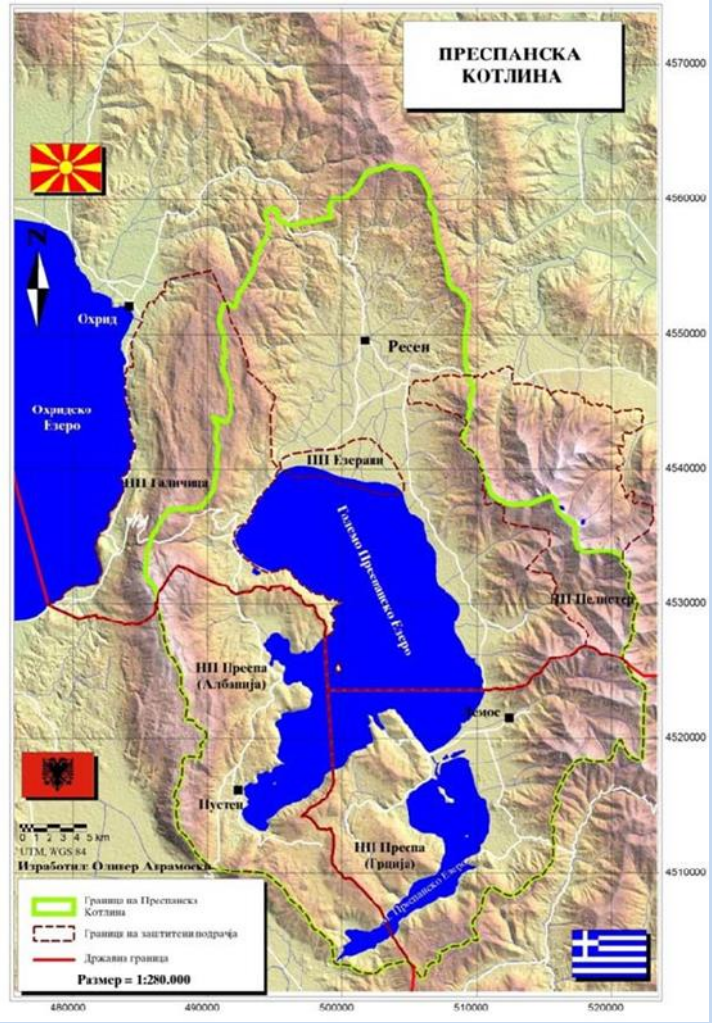

Figure 4. Location of Prespa Lake and Prespa Valley

2.2. Ecological information related to the Habitats and the Birds Directives

The data presented in this chapter is mainly based on inventories carried out by the Twinning project team in the summer of 2018, and data from inventories provided by MoEPP. National experts have also participated in the field work, and have also given comments and evaluations. National experts have also provided their own data for this Annex, especially data on habitat types and vascular plants, as well as relevant data on reptiles and amphibians, in the frame of the EU/UNDP project for Improvement of management of Protected Areas. The importance of the PONT/MES project for identifying habitats in the area is worth emphasizing (Fotiadis et al. 2018). In addition, recent literature derived from bat inventories have been used in this chapter (ANNEX 5).

2.2.1. Ecosystems and habitats

A total of 12 habitat types (Figures 5, 6), listed in the Annex I of the EU Habitats Directive, were found in the area of Prespa Lake NM and surroundings (around Konjsko and Stenje at the western lake shores, and around Asamati, Pretor, Krani, Štrbovo and Nakolec into the boarder with Greece at the eastern lake shores and the road from Greece to Resen).

Parts of these habitat types and their species composition are introduced in Facts Sheets, described in the *ANNEXES* of "The Annex for the Revalorization Study for the "Lake Prespa" Monument of Nature".

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Maps of habitats

Figure 5. Scheme of habitats of Prespa Lake NM and Ezerani Nature Park

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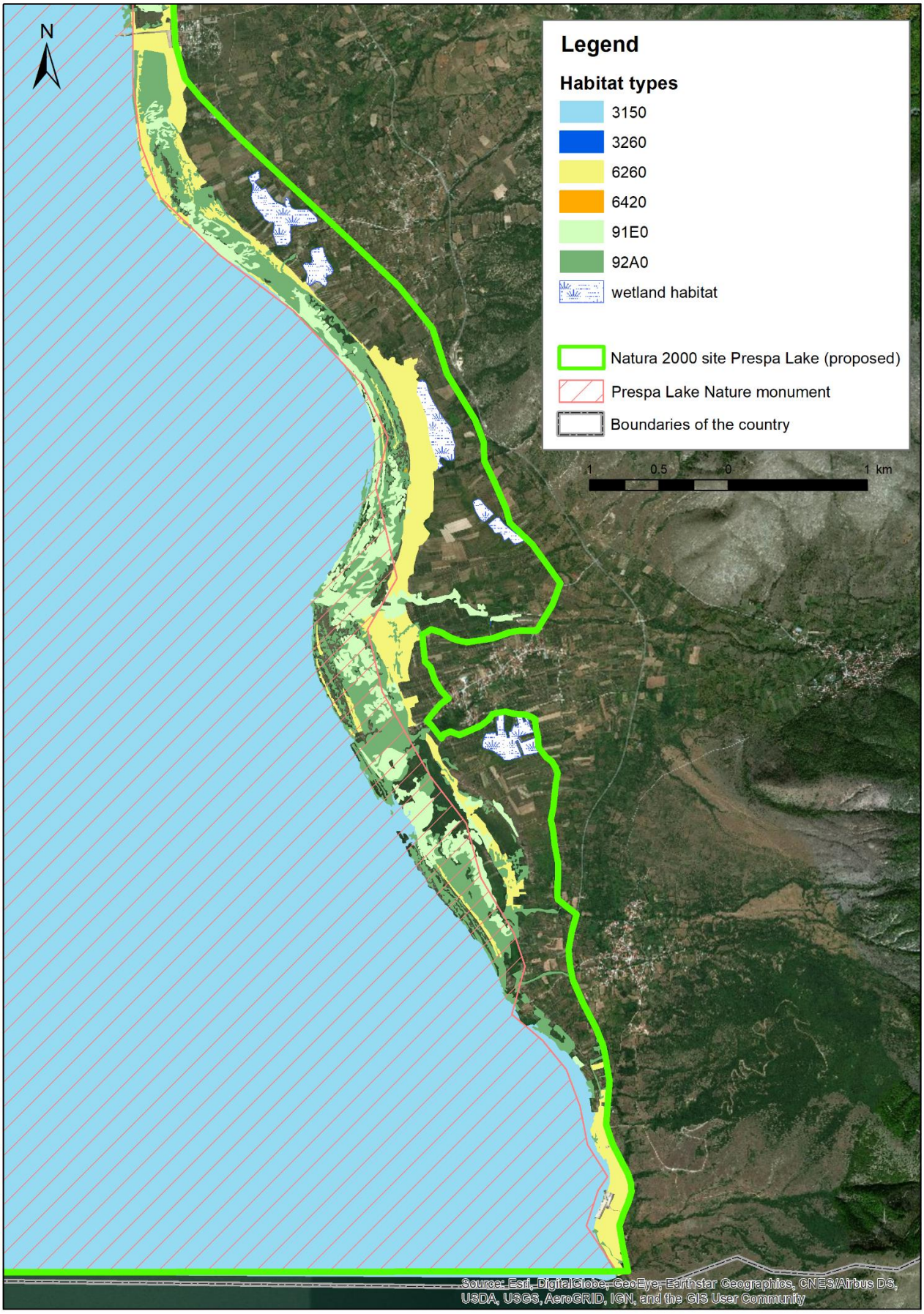

Figure 6. Detailed scheme of habitats at eastern shores of Prespa Lake

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Ecosystems and habitats listed (1. – 12.)

Magnopotamion with pondweeds (Potamogeton spp.) and reed bed in front of Stenje village.

Submerged plants: Potamogeton pectinatus, Potamogeton crispus, Myriophyllum sp. etc.

Photos: Kimmo Syrjänen

1. *3150 Natural eutrophic lakes with Magnopotamion or Hydrocharition – type vegetation.*

This is the most common and typical habitat type of the Habitats Directive at the Prespa Lake. Open water areas, with their typical water chemistry and species composition of aquatic and benthic fauna and flora, are also included in this habitat type. In addition to submerged pondweed vegetation, this type includes reedbeds *(Phragmites australis)* growing in water. Vegetation in this habitat type is characterized by both submerged pondweed (*Magnopotamion*) vegetation, at depth of about 0,5 – 5 m, and floating Frogbit communities *(Hydrocharition)* in still shallow shoreline waters. Included is also all other tall helophyte stands *(Schoenoplectus lacustris, Typha spp., Iris pseudacorus)*, along shores of eutrophic lakes, ponds and pools.

This habitat type covers all species of Prespa Lake which inhabits pelagic, submerged and benthic ecosystems. Many of the species are already listed in the Study (ECE 2013), including introduced, endemic and other native species. Transitional habitats like reedbeds are also important for biodiversity preservation. The submerged pondweed vegetation zone provides food for fish and invertebrates, and are also the most important food resource for certain wintering water birds like Eurasian Coot *(Fulica atra)* and Tufted Duck *(Aythya fuligula).*

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Eutrophicated lower reach of Brajcinska river at Prespa Lake National Monument. Photo: Kimmo Syrjänen.

2. ***3260 Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation.***

Most streams and rivers at Prespa Lake belong to this habitat type consisting of scattered, submerged vegetation *(Callitriche cophocarpa, Callitriche spp., Potamogeton natans, Potamogeton spp., Ranunculus aquatilis, Fontinalis antipyretica,* etc*.)*. Vegetation related to mesotrophic and eutrophic streams is found at medium, and especially at lower parts, of running waters entering into Prespa Lake.

3. ***92A0 Salix alba and Populus alba galleries.***

4. ***3290 Intermittently flowing Mediterranean rivers of the Paspalo-Agrostidion.***

In lower areas towards Prespa Lake shoreline, river habitats include tree-curtains of *Salix alba, Alnus glutinosa* and *Populus alba.* Typically and naturally these river shoreline habitats belong to *92A0 Salix alba and Populus alba galleries*, but riparian habitats at lower part of rivers running into Prespa Lake have changed due to human activities. Nitrophilous vegetation is common including common invasive species *Bidens frondosa* and *Urtica dioica*, and at least parts of rivers does already resemble habitat *3290 Intermittently flowing Mediterranean rivers of the Paspalo-Agrostidion,* which is also present on the Greek side of Prespa. These habitats are found, although in low quantities, at lower parts of rivers running into Prespa Lake.

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5. ***3270 Rivers with muddy banks with Chenopodion rubri p.p.* and *Bidention p.p. vegetation.***

Together with the following alluvial banks habitat types; *3260 Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation,* and *3280 Constantly flowing Mediterranean rivers with Paspalo-Agrostidion species and hanging curtains of Salix and Populus alba*, there are also small quantities of this type, with annual pioneer nitrophilous vegetation, including *Bidens frondosus* and *Polygonum lapathifolium.*

6. ***6220* Pseudo-steppe with grasses and annuals of the Thero-Brachypodietea.***

This habitat type is present in low quantities along Prespa Lake on terrestrial dry exposed shoreline slopes, often with some junipers (*Juniperus communis, J. oxycedrus)* or wild almond *(Prunus webbii)*. Small area locations are present at the calcareous east shoreline of Prespa Lake NM.

Pannonic sand steppes is a priority habitat type that has its southernmost occurrences in Europe along the coasts of Prespa Lake. Sand steppe close to village Sthrobovo.

Photos: Kimmo Syrjänen

Silene frivaldszkyana is a typical species of this habitat type at Prespa. It is a Balkan endemic plant and has rather narrow distribution at Albania, North Macedonia, Greece, Bulgaria and European part of Turkey.

7. ***6260* Pannonic sand steppes.***

There are many locations consisting of sandy grasslands with perennial herbs, grasses and therophytes, belonging to this habitat type around the shorelines of Prespa Lake, both on the western and eastern side. Especially present at sandy shorelines around Stenje village, but less around Kojnze. Locations are more widely scattered along the east shores, in and between Dolno Dupeni, Nakolec, Štrbovo, Krani and Asamati. The composition of different vegetation communities is somewhat variable. At western shores these sandy habitats are mainly calcareous, and on the eastern shorelines more nutrient-poor and of silicate origin.

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The habitat type 7220 is rare both at Pelister National Park and at Prespa Lake Localities are characterized by presence of *Cratoneuron filicinum* and/or *Palustriella spp.* moss species and hard alkaline water. Tufa formation is not strong and the sites are not very representative. Picture showing *Cratoneuron* -spring close to lake Prespa, Oteshevo. Photo: Kimmo Syrjänen.

8. *7220* Petrifying springs with tufa formation (Cratoneurion).*

Present in small quantities at calcareous western shores of Lake Prespa in Sir Han and Oteshevo villages. Low presence of these springs at Prespa Lake NM is caused by human disturbance.

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Alluvial forests 91E0 * in Prespa Lake at Ezerani protected area near village Dolno Perovo consist of both *Salix alba* dominated forests (this photo), and *Alnus glutinosa* dominated stands. *Populus alba* and *Populus nigra* are also present in these forests. Photo: Kimmo Syrjänen

9. *91E0* Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae).*

This priority habitat type is present at Prespa Lake, represented by several stands of alluvial forests. Regrettably, often the hydrology has changed due to regulation of watercourses and ditching. Succession towards drier habitat types is an ongoing process at Prespa Lake NM, and parts of this habitat type have already disappeared.

10. *6430 Hydrophilous tall herb communities of plains and of the montane to alpine levels.*

Due to limited phytocenological research in this area, the habitat is here recognized by the dominant presence of *Calamagrostis epigeos*. This is a characteristic species of high grassland communities beside flat rivers or other water bodies. Among the predominant species are *C. epigeios, Cirsium arvense, Dipsacum fullonum, Potentilla reptans* and others (see Fotiadis et al. 2018).

11. *6510 Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis).*

This species-rich habitat type is represented in humid meadows, appearing on relatively flat soils, which occasionally have been used, or can be used, for agricultural harvest during drought years. Main predominant species here are *Cynosurus cristatus, Anthoxanthum odoratum, Carex hirta, Galium verum, Holcus lanatus, Plantago lanceolata, Potentilla reptans* and others.

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The habitat **6510** has a broad frame that covers large-scale communities, so it was considered that Sub-Mediterranean lowland meadows from areas in the country should be separated into a separate (sub) habitat.

12. ***6420 Mediterranean tall humid grassland of Molinio-Holochenion***.

According to Fotiadis et al. (2018) this habitat type in the Prespa area has very limited extension with only 0,04 hectares. This habitat type represents humid to wet meadows, appearing in small ponds in the perimeter of reeds. The observed stand has particularly high species richness, with 38 different plant taxa recorded in a plot of just 16 m^2. Moreover, this habitat is important for bird and amphibian species.

2.2.2. Flora

Two plant species from Prespa Lake are included into Habitats Directive Annex II or IV plant lists. Fresh observations are available for *Aldrovanda vesiculosa*, but the species *Lindernia procumbens* was last observed more than 100 years ago, and the present situation is unknown. There are also several other vascular plants species in Prespa area which are nationally rare and protected by the Nature Conservation Act. These include: *Nymphaea alba, Beckmannia eruciformis, Glyceria maxima, Rumex hydrolapatum* and *Salvinia natans*.

1. **Water Wheel Plant (*Aldrovanda vesiculosa)***

Habitats Directive, Annex II and IV, species code **1516**. The waterwheel plant is a rootless carnivorous water plant that typically floats freely in shallow fresh water. *A. vesiculosa* is classified as endangered (EN) by IUCN worldwide (Cross 2012). During the last centuries it has become extinct in 32 countries. In Prespa Lake NM, recent observations have been made in the vicinities of Sir Han and Nakolec villages. Eutrophication and too dense reedbeds can cause problems for the species through changes in water chemistry and shading. Eutrophication can also increase competition e.g. by algae and other floating vascular plants. Moreover, ditching, decreasing water table and overgrowth are threats to this species.

2. **Prostrate False Pimpernel *(Lindernia procumbens)***

Habitats Directive, Annex IV, species code **1725**; Classified as least concern (LC) at global, European and EU level. It was observed at shores of Prespa Lake more than 100 years ago, but there are no present observations on this species, despite several visits made by botanists. Hence it might be considered locally extinct. The species inhabits open wet nutrient rich soil, and may grow at alluvial shores of lakes, river banks and ponds. It can also be present in a variety of human made artificial and seasonally wet environments, including fish ponds and agricultural fields. It is a short-living annual low-growing species requiring disturbed environments like grazed shores. This type of habitat has decreased in the Prespa Lake area, and also other species requiring open wet alluvial soil, are nowadays rare and still decreasing here.

Invasive plant species at Prespa Lake NM

Due to a decrease in water level over large areas, a lot of new shorelines have emerged in Prespa Lake during the last decades. In large parts of the east shores extensive reed beds are presently colonizing emerging shallow waters. At western shores reed bed vegetation is less abundant.

In addition to reed beds there are other man-made habitats experiencing colonization by invasive alien species. In shoreline areas there are many human activities bringing disturbances of soil, like excavation of sand and gravel, digging for pipelines and cables, etc., and this creates suitable conditions for establishment of invasive species. In Prespa Lake area there are also populations of old ornamental plants from the Yugoslavian period in

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surroundings of present and past hotels, as well as around abandoned recreational sites. These stands of invasive species may further colonize new open soil in proximity areas.

The Black Locust is a common invasive species along shores of Prespa Lake. Young tree in Ezerani Nature Park.
Photo: Kimmo Syrjänen.

1. Black Locust/False Acacia (*Robinia pseudacacia)*

The most common and most spreading invasive tree species in Macedonia. *R. pseudacacia* is also the most common and harmful invasive species at the terrestrial shorelines of Prespa Lake. It causes overgrowth of open habitats and replaces native species. This species is very abundant and continuously spreading, especially at western shores, e.g. on the shorelines between Ezerani and Oteshevo. All stands inside the border of Prespa Lake NM should be removed.

2. Desert False Indigo (*Amorpha fruticose)*

A bush forming dense stands. Originating from North America and used for ornamental, melliferous and erosion control purposes. Like *Robinia pseudacacia* it belongs to the Pea family and through nitrogen fixation it can effectively colonize nutrient poor soils, thereby increasing levels of nitrogen and general eutrophication. *A. fruticosa* is locally common in Resen, and has also invaded localities in Ezerani Nature Park. It may cause problems in the future also in other parts of Prespa, including Prespa Lake NM. All individuals inside protected areas should be removed.

3. Tree-of-heaven (*Ailanthus altissima)*

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A tree of East Asian origin used for ornamental purposes. *A. altissima* is spreading from a corner of the Prespa Lake NM protected area in Sir Han, where there are small stands in two nearby locations.

4. **Ashleaf Maple *(Acer negundo)***

A tree from North America that has been introduced mainly for ornamental purposes in Europe. In Prespa Lake NM, *A. negundo* is present with stands consisting of mainly young scattered trees, especially along the western shorelines.

Moreover, at western shores of Prespa Lake, scattered populations of young spontaneously spreading *Pinus sylvestris* are found some places. Like all above mentioned tree species, individuals of this should be removed.

Invasive water plant species

In the group herbaceous invasive species, there are two aquatic plants which can cause extensive problems in the Prespa Lake, namely *Elodea canadensis* and *Azolla filiculoides*:

1. **Canadian Waterweed *(Elodea canadensis)***

A submerged aquatic plant from North America. Introduction of *E. canadensis* into European watercourses has caused severe problems for more than a century. This perennial species was observed at Prespa Lake for the first time in 2018 (Fotiadis et al. 2018). Further expansion of populations can increase eutrophication and change the composition of current vegetation in Prespa Lake.

2. **Water Fern *(Azolla filiculoides)***

Strid et al. (2017) reports observations of *A. filiculoides* from several sites in the southern Greek part of Prespa Lake. This species is found in the Nakolec wetlands at shores of Prespa Lake. It is listed in EPPO Observation List of invasive alien plants. This aquatic fern is forming floating mats in shallow water. It can compete with *Salvinia natans*, which has a similar ecology and is native to Prespa Lake. It can also compete with the Habitats Directive species *Aldrovanda vesiculosa*, which grows in similar habitats, partly floating and partly submerged. Extensive mats of *A. filiculoides* can shadow out all submerged plants.

Other invasive herbs

There are several invasive herb species at Prespa Lake NM. Perhaps most common is the annual Beggarticks *(Bidens frondosa)*, which abundantly grows along reedbeds, riversides and ditches over the area. It can compete with local species including the protected grass species *Beckmannia eruciformis*. There are scattered observations on Tall Fleabane *(Erigeron annuus)*, e.g. close to Nakolec village. The Yellow Dodder *(Cuscuta campestris)* has been observed in Nakolec and Asamati. This parasitic annual weed is an important pest of Lucerne and other legumes. Rough cocklebur *(Xanthium strumarium)* and Italian Cocklebur *(Xanthium italicum)* are common in shorelines, mainly open or ruderal places.

Other ruderal annual weeds known to be invasive, like *Erigeron spp., Amaranthus ssp., Xanthium spinosum, Phytolacca dioica, Dasyphania ambrosioides, Disphania multifida,* etc., are present in Prespa Lake NM, but these species does not seem at present to be a severe threat to natural habitats.

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2.2.3. Fauna

A total of **14 fauna species (other than birds)** of the Habitats Directive Annexes II and IV have been identified during the inventories in 2018 by the present Twinning project. However, the complete list of observed species listed under the Habitats Directive Annexes II and IV in the area is substantially longer, **41 species altogether** (see. ANNEX 3). These include also recent literature observations (ANNEX 5) and data obtained from national experts who were co-working with the Twinning team.

1. **European Tree Frog *(Hyla arborea)***

Habitats Directive, Annex IV, species code **1203.** The species lives usually in habitats bordering wetlands. Adult individuals can be found in areas with higher vegetation, and also separate from pools.

2. **Herman's Tortoise *(Testudo hermanni)***

Habitats Directive, Annex II and IV, species code **1217.** Herman's Tortoise lives in many types of natural habitats like different types of meadows, forests and bushlands. There is a viable population present in the area. Especially the shorelines at Prespa NM at Sir Han – Oteshevo are hosting dense viable population of the species. It is also abundant at Golem Grad Island.

3. **Otter *(Lutra lutra)***

Habitats Directive, Annex II and IV, species code **4111.** The species can be found close to a variety of waterbodies. Otters occupy both standing and running waters, and they also search for food along very small streams. Otters move over large distances, and have good dispersal abilities.

4. **Agile Frog *(Rana dalmatina)***

Habitats Directive, Annex IV, species code **1209.** The species is common in the area, and can be found in many kinds of moist habitats. This includes shores of lakes and ponds, wetlands, ditches, riversides and small streams. Adult individuals move easily in moist forest areas, and can be found far from open water bodies. Adult individuals also visit moist caves.

5. **Common Wall Lizard (*Podarcis muralis*)**

Habitats Directive, Annex IV, species code **1256.** A very common species living in many types of habitats. These include warm forest slopes, forest edges, scrublands and roadsides, in addition to many types of cultural landscape habitats.

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Podarchis erhardii. Photo: Petri Ahlroth

6. Erhard's Wall Lizard (*Podarcis erhardii)*

Habitats Directive, Annex IV, species code **1238.** This species lives in sunny rocky meadows, open cliffs and other stony habitats.

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Podarcis tauricus. Photo: Petri Ahlroth

7. Balkan Wall Lizard (*Podarcis tauricus)*

Habitats Directive, Annex IV, species code **1248.** This species favour dry meadows, often on sandy soils, scrublands and rocky shores. It is relatively common, but limited to lower altitudes in the area.

8. Dice Snake (*Natrix tesselata)*

Habitats Directive, Annex II and IV, species code **1292.** This species favours shores of lakes and wetlands. It finds shelter in higher grass vegetation or in rocky habitats. Usually observed close to water.

9. Caspian White Snake (*Dolichophis caspius)*

Habitats Directive, Annex IV, species code **6138.** The species can be found in warm, rocky meadows, on shores and in scrublands.

10. Three Lined Lizard (*Lacerta trilineata)*

Habitats Directive, Annex IV, species code **1251.** The species favour semi-open scrubland areas, sunny forest edges, roadsides and rocky grasslands with a mosaic of higher vegetation and open patches.

11. Balkan Green Lizard (*Lacerta viridis)*

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Habitats Directive, Annex IV, species code **1263.** The species favour semi-open scrubland areas, sunny forest edges, roadsides and rocky grasslands with mosaic of higher vegetation and open patches.

12. **Cerambyx Longicorn *(Cerambyx cerdo)***

Habitats Directive, Annex II and IV, species code **1088**. The species lives on forests, in parks and other semi-open habitats with large dead Oaks (*Quercus sp.*), it favours warm edges of forests, slopes and roadsides. The species requires large old trees with strong bark, and a major problem for the species is a shortfall of old oak trees. The species requires a continuum of dead oaks at certain stage.

13. **European Pond Terrapin (*Emys orbicularis)***

Habitats Directive, Annex II and IV, species code **1382.** European Pond Terrapins live in waterbodies and in wetlands. They thrive both in standing waters and slowly moving streams.

14. **Macedonian Crested Newt *(Triturus macedonicus, syn. T. carnifex, T. cristatus carnifex*)**

Habitats Directive, Annex II and IV, species code **5364**. This species favours small waterbodies, since these provide a safer reproduction environment than lakes. In lakes the offspring are under threat from predation of fish, and hence fish-free wetlands do provide better living conditions for the young stages in development. Ditching often prevent the formation of small temporal ponds, and other habitats, suitable for the species.

Data on other vertebrates and invertebrates

In addition to the above mentioned amphibian (toad) species, there are also observations in Prespa Lake NM of the European Green Toad *(Bufo viridis* syn. *Bufodes viridis)*, (Habitats Directive, Annex IV, species code **1201**) and the Eastern Spadefoot/Syrian Spadefoot *(Pelobates syriacus)*, (Habitats Directive, Annex IV, species code **1200**) The latter from the surroundings of Novo Perovo and Asamati, as well as near the Prespa Lake (ECE 2013). The location in Ezerani is designated one of the five most important sites for *P. syriacus* in Macedonia (ECE 2013).

These two toad species were not reported in 2018 by the Twinning project, which would indicate that they can be rather rare, but they probably both still exist in the area. Since they are night active, these species are not easy, or even possible, to detect during day time. According to information from UNDP (Dragan Arsovski, pers. comm.), the most recent observations for European Green Toad from this area, was made in Oteshevo (2010) and Stenje (2014). Both species are present also at the Greek part of Prespa Lake (Bousbouras & Ioannidis 1997).

Additional species reported by UNDP (Dragan Arsovski, pers. comm) are Four-lined Snake, *(Elaphe quatuorlineata)*, (Habitats Directive, Annex II and IV, species code **1279**) which is present around Prespa Lake NM at Konjsko and Stenje (according to data collected in 2011 and 2014), and Blue-throated Keeled Lizard/Dalmatian Algyroides *(Algyroides nigropunctatus)*, (Habitats Directive, Annex IV, species code **1243**), oserved at Konjsko and at the Albanian border (on cliffs and rocks next to the lake), as well as in Oteshevo and Stenje (data from 2010-2014). Moreover, the Balkan Whip Snake *(Hierophis gemonensis)*, (Habitats Directive, Annex IV, species code **5669**) is very rare in the country, and one of the data points comes from Stenje village in 2005. All of these species are moving in the landscape (especially the snakes), thus they will be close to the lake at some point, some of them likely residing there most of the time.

A general conclusion regarding reptiles and amphibians, is that all shoreline habitats of Prespa Lake are important for these species. The Dice Snake *(Natrix tesselata)*, (sp. 8. above) is relatively common on all shores along the lake. On western shores there are populations of several other reptiles and amphibians in addition to the above mentioned species. Also Herman's Tortoise *(Testudo hermanni)*, (sp. 2.) is observed along shoreline and in Sir Han. There is large and viable population of the species in Prespa Lake NM.

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Common Wall Lizard *(Podarcis muralis)*, (sp. 5.), Erhard's Wall Lizard *(Podarcis erhardii)*, (sp. 6.), Balkan Wall Lizard *(Podarcis tauricus)*, (sp. 7.), Three Lined Lizard *(Lacerta trilineata)*, (sp. 10.) and Balkan Green Lizard *(Lacerta viridis)*, (sp. 11.) are common in dry shoreline habitats, and the rare Caspian White Snake *(Dolichophis caspius)*, (sp. 9.) is also observed in the area.

The western coast of Prespa Lake from Sir Han to Konjsko has only some coverage of habitat types under the Habitats Directive. But the area hosts several reptiles and amphibians under the Habitats Directive, and this should be taken into consideration when planning and implementing management actions in this shoreline area.

Bats

There has been made a couple of recent studies on bat species composition in Prespa Lake NM area (Micevski et al. 2014, Papadatou et al. 2011, Presetnik 2015). It has been documented three bat species of Annex II, and 10 species of Annex IV of Habitats Directive in the area. Also all other *Microchiroptera* (Microbats) are included in Annex IV even if they are not specified to species in the list.

During this decade the following species have been recorded from Prespa Lake NM area in spring periods (Presetnik 2015): Common Bent-wing Bat/Schreibers's Long-fingered Bat *(Miniopterus schreibersii)*, (Habitats Directive, Annex II and IV, species code **1310**), Kuhl's Pipistrelle *(Pipistrellus kuhlii),* (Habitats Directive, Annex IV, species code **2016**), Nathusius' Pipistrelle *(Pipistrellus nathusii),* (Habitats Directive, Annex IV, species code **1317**), Common Pipistrelle *(Pipistrellus pipistrellus),* (Habitats Directive, Annex IV, species code **1309**) and Lesser Horseshoe Bat *(Rhinolophus hipposideros),* (Habitats Directive, Annex II and IV, species code **1303**). These observations have mainly been done in the surroundings of Krani village.

In addition to these, the following species have been observed at the vicinities of Asamati and Nacolec villages, this in the autumn period (Micevski et al. 2014): Long-fingered Bat (*Myotis capaccinii)*, (Habitats Directive, Annex II and IV, species code **1316**), Parti-coloured Bat/Rearmouse *(Vespertilio murinus)*, (Habitats Directive, Annex IV, species code **1332**), Serotine Bat *(Eptesicus serotinus)*, (Habitats Directive, Annex IV, species code **1327**), Savi's Pipistrelle *(Hypsugo savii)*, (Habitats Directive, Annex IV, species code **5365**), Soprano Pipistrelle *(Pipistrellus pygmaeus)*, (Habitats Directive, Annex IV, species code **5009**), Common Noctule *(Nyctalus noctula)*, (Habitats Directive, Annex IV, species code **1312**), Lesser Noctule *(Nyctalus leisleri)*, (Habitats Directive, Annex IV, species code **1331**), one Long-eared Bat species *(Plecotus sp.)*, (Habitats Directive, Annex IV, species code **5010**). In addition to these, the Mediterranean Horseshoe Bat *(Rhinolophus euryale)*, (Habitats Directive, Annex II and IV, species code **1305**) were observed during the Twinning project at Stenje/Oteshevo. Altogether 14 Habitats Directive bat species have been found recently in the area. In surrounding areas there have been registered some additional bat species.

Fish

In the Prespa Lake there has been identified 12 introduced and 11 native fish species. From the latter 9 species are endemic (82 %), these are: The Prespa Spirlin *(Alburnoides prespensis)*, Prespa Bleak *(Alburnus belvica)*, Prespa Barbel *(Barbus prespensis)*, Prespa Nase *(Chondrostoma prespense)*, Prespa Spined Loach *(Cobitis meridionalis)*, Prespa Minnow *(Pelasgus prespensis)*, Prespa Roach *(Rutilus prespensis)*, Prespa Trout *(Salmo peristericus)* and the Prespa Chub *(Squalius prespensis)* (Talevski et al. 2014). The Prespa Barbel is more widely distributed in Albania and not only confined to the Prespa basin, Implementing specific measures for habitats of protected species in small water bodies and populations of old trees The fish species covered by the Habitats Directive Annex II are: The Prespa Spined Loach *(Cobitis meridionalis),* (species code **5310**), Prespa Minnow *(Pelasgus prespensis),* (species code **6264**), Prespa Roach *(Rutilus prespensis),* (species code **5343**) and the Prespa Trout *(Salmo peristericus),* (species code **5355**).

Some introduced fish species can be very harmful to native fish populations and the ecosystem as a whole. For example, the Stone Moroko *(Pseudorasbora parva)* is regarded as one of the 100 most harmful European invasive species. The Rainbow Trout *(Oncorhynchus mykiss)* has been farmed at fish ponds along lake and may be a problematic invasive alien in Prespa Lake. Also the introduced Tench/Doctor Fish *(Tinca tinca)* and the Catfish *(Silurus glanis)*, can have invasive characteristics. Fish parasites can also spread together with introduced fish.

Some of the introduced fish species have a long history in the lake, e. g. the Common Carp/European Carp *(Cyprinus carpio)* which was introduced to the Prespa Lake at Roman time, as well as the Prussian Carp

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(Carassius gibelio) which was brought from Asia to Europein the 17th century (Ceroni 2013) and introduced into Prespa Lake in the 1970's (Koutseri 2012). The Pumpkinseed *(Lepomis gibbosus)* was probably introduced as late as in the 1990's, and the Mosquito Fish *(Gambusia holbrooki)* in 1995 (Koutseri 2012). Both of these latter fish species can be aggressive and dangerous invasive species, causing negative changes to natural lake ecosystems.

Fish are also an important food source for several wintering and breeding birds, including the Goosander, Cormorants and Grebes. In addition to being the the most important commercial fish species in the Prespa Lake, the Prespa Blake is also the main food source for the Dalmatian Pelican (BirdLife International 2019).

The eradication of invasive species by selective fishing is needed to mitigate the risks for endemic species and secure the viability of commercial fishing in the Prespa Lakes (including Lake Micro Prespa in Greece and Albania), (UNDP 2012). This goal is also listed as one of the Environmental Protection Sector priorities in recent report by Mousios & Martelli (2019).

Other invertebrates

Several endemic gastropods inhabit the Prespa Lakes (ECE 2013). The following species; *Planorbis (Crassiplanorbis) prespensis, Bithynia prespensis, Parabythinella malaprespensis* and *Parabythinella macedonica* are endemic for the two Prespa Lakes. Endemic species only for Macro Prespa Lake (thereby included in Prespa Lake NM) are; *Prespolitorea valvataeformis, Pyrgohydrobia (Prespopyrgula) prespensis, Vinodolia (Prespiana) lacustris, Radix pinteri, Planorbarius corneus arabatzis, Gyraulus stankovici*. *Pisidium maasseni* (Class Bivalvia) is also endemic for Macro Prespa Lake (ECE 2013). Recently a new endemic gastropode species *Bithynia shapkarevi* has been described from Prespa Lake NM, with type locality close to the village Asamati (Glöer et al. 2015).

Of these gastropods *Parabythinella macedonica* is listed as Endangered (EN), and *Prespolitorea valvataeformis, Prespolitorea malaprespensis* and *Prespopyrgula prespensis* are listed as Critically endangered (CR) according to the IUCN World Red List. The Bivalvia species *Dreissena presbensis (syn. D. stankovici)*, an endemic species for Prespa and Ochrid lakes (Reischütz & Fischer 2008), is listed as Near Threatened (NT).

The Ostracods (*Metazoa* belonging to *phylum Arthropoda*) are represented by many endemic species (ECE 2013). *Candona marginatoides* and *Candonapaionica minor* are observed only in Prespa Lake, whereas *Paralymnocythere karamani* and *Leptocythere prespensis* are present in Ochrid Lake as well. *Typhlocypris (Pseudocandona) prespica* is endemic to Western Balkans.

The following two Sponges (*phylum Porifera*); *Spongila prespensis* and *Turbellaria Dendrocoelum prespense*, are endemic species of Prespa Lake (ECE 2013).

Insects

The total number of insect species found in Prespa Lake NM area is very high. However, in this project with limited time, it has not been possible to identify all observed species. For many taxonomic groups of insects, background information is very limited, or it does not exist at all. For this reason it has been relatively easy to record new species observations for the country. From performed inventories only one insect included in the Habitats Directive, the Cerambyx Longicorn *(Cerambyx cerdo),* was found inside Prespa Lake NM. This species is much more common in the immediate vicinity of the oak woods of Galicica, at western shoreline slopes of Prespa Lake. Another Habitats Directive species, the Stag beetle *(Lucanus cervus)*, (Habitats Directive, Annex II, species code **1083**) is also living in these forests and can visit Prespa Lake NM occasionally. At the former Hotel Europa area we found the remains of the Coleoptera species *Osmoderma eremita*. All species of the Hermit Beetle/Russian Leather Beetle group are included in the Habitats Directive Annex II and IV (species codes **5378 - 5381**). These species may be present in Prespa Lake NM area and inside Galicica National Park.

In earlier projects one Habitats Directive Dragonfly (Order Odonata) species, the Large White-faced Darter/Yellow-spotted Whiteface *(Leucorrhinia pectoralis)*, (Habitats Directive, Annex II and IV, species code **1042**) and several Habitats Directive butterflies (e. g. *Euphydryas aurinia, Lycaena dispar, Parnassius apollo and Parnassius mnemosyne)* were recorded (ECE 2013). In principle there are suitable environments for Habitats Directive butterflies and dragonflies in Prespa Lake NM, but none was observed during the inventories in 2018.

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Invasive insects

For the invertebrate fauna alien species doesn't play a big role. On the other hand, some of the most abundant insect species in the Prespa region are aliens. The Harlequin Ladybird (*Harmonia axyridis*), Western Conifer Seed Bug (*Leptoglossus occidentalis*) and Brown Marmorated Stink Bug (*Halymorpha halys*) are all very common in the area. All of these species have already colonized all other Balkan countries and large areas in Central and Western Europe. In this situation there is little hope of eliminating them anymore. Many invasive insects have good dispersal ability and strong reproduction potential. With these abilities, and when lacking their original natural enemies, they have shown amazing ability to colonize new areas. This is very typical for many invasive alien species.

2.2.4. Birds

The Prespa Lake is an internationally important area for wintering and migrating waterfowls. The total number of waterbirds wintering at Prespa Lake (the part inside the Republic of North Macedonia) has been nearly 15,000 individuals each year during the 2010's. The breeding birds are also important, including e. g. colonies of the Great Crested Grebe (*Podiceps cristatus*) and Coot (*Fulica atra*). The most numerous breeding bird species is the Great Cormorant with nearly 3,000 pairs at Golem Grad Island.

The main data-set for the birds is based on a round count inventory in Prespa Lake performed on 18.04.2018. During implementation of the Twinning project a total of 22 bird species were observed, of which 11 are listed in the Birds Directive Annex I, and 2 listed in the Birds Directive Annex II.

The Pygmy Cormorant breeds in small numbers in North Macedonia. It mainly disperses to feed at Prespa Lake from larger breeding grounds in Lesser Prespa Lake in Greece.

1. **Pygmy Cormorant *(Microcarbo pygmaeus)***

This species favour reedbeds with willow (*Salix)* trees as nesting habitat. Outside the breeding season it inhabits a wide variety of waterbodies. A partially migratory bird not breeding at Prespa Lake NM.

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Dalmatian Pelicans resting together with Great Cormorants. This is the largest of all pelicans and is classified as globally near-threatened. The world's largest breeding colony is found in Lesser (Micro) Prespa Lake in Greece, from which hundreds of birds disperse to feed at (Macro) Prespa Lake.

2. Dalmatian Pelican *(Pelecanus crispus)*

This species favours small islands in freshwater lakes, or dense aquatic vegetation as breeding habitats, mainly at inland freshwater wetlands. Large lakes are important stop-over sites during migration. Dispersive. Hundreds of individuals are observed annually at Prespa Lake, dispersing from breeding grounds in Greece, Lesser Prespa Lake.

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The Little Egret is a rare breeding species in North Macedonia.

3. Little Egret *(Egretta garzetta)*

This species inhabits fresh, brackish or saline wetlands, showing preference for shallow waters. A migratory bird not breeding at Prespa Lake (in RNM). A variable number of birds are dispersing from breeding grounds in Greece, Lesser (Micro) Prespa Lake.

4. Great Egret *(Ardea alba)**

This species inhabits various inland and coastal wetlands. A migratory bird not breeding at Prespa Lake NM.

5. Squacco Hero *(Ardeola ralloides)*

This species inhabits wetlands with luxuriant aquatic vegetation. A migratory bird not breeding at Prespa Lake NM.

6. Black-winged Stil *(Himantopus himantopus)*

This species favours shallow freshwater and brackish wetlands with open margins. A migratory bird not breeding at Prespa Lake NM.

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7. Common Kingfisher *(Alcedo atthis)*

This species favours still or slow flowing waters with plenty of small fish. Partially migratory. A few pairs breed at Prespa Lake NM

The Common Kingfisher breeds in sparse numbers along riversides, excavating nest-holes in sandbanks.

8. The red-backed Shrike *(Lanius collurio)*

This insect feeder is common at scrubland and dry habitats along Prespa Lake shores, and is foraging at different habitat types in the area. A migratory bird breeding at Prespa Lake NM.

9. Woodlark *(Lullula arborea)*

This species favours open habitats and is commonly observed in Prespa Lake NM. Migratory. May be breeding at Prespa Lake NM and especially in the surroundings of the lake.

10. Barred Warbler *(Sylvia nisoria)*

This species favours semi-open habitats with bushes and edges of forests. The breeding population size has not been estimated.

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Female and male of Montagu's Harrier. A major part of the North Macedonian population breeds in the Pelagonia Valley.

11. **Montagu's Harrier** ***(Circus pygargus)***

A rare species observed during migration, but also during the breeding period. Possibly breeding in open grassland areas.

12. **Goosander** ***(Mergus merganser)***

A migratory and wintering species.

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The Turtle Dove breeds in large numbers in North Macedonia, but has drastically decreased in Europe in recent decades.

13. ***Turtle Dove (Streptopelia turtur)***

A very common and abundant species in the vicinities of Prespa Lake. It prefers edges of forests or territories overgrown with high bushes in semi-open landscape.

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3. Assessment of values

3.1. Values of the area

3.1.1. Natural values and importance in EU context

Nature values have here been evaluated in the European Community Importance context. **12 habitats** of the Habitats Directive Annex I, **41 species** protected by Annex II and IV of the Habitats Directive and **13 bird species** protected by the Birds Directive, together with a large amount of endemic species of aquatic ecosystems having European Community interest, were identified during implementation of the Twinning project (2018-2019). The data are based on field observations and recent literature (ANNEX 5). In sum it has been identified a high number of nature values in the Prespa Lake NM and surroundings. In this summary part an ecosystems approach has been used, and the key values, for habitats and species, has been grouped according to the three key ecosystems types found in the area. These three are:

The aquatic ecosystem:

Habitats: (Habitats Directive, Annex I):
3150 Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation.

Flora (plant) species:
Water Wheel Plant (*Aldrovanda vesiculosa*), (Habitats Directive, Annex II and IV, species code **1516**)

Fauna (animal) species:
Otter *(Lutra lutra)*, (Habitats Directive, Annex II and IV, species code **4111**)
Prespa Spined Loach *(Cobitis meridionalis)*, (Habitats Directive, Annex II, species code **5310**)
Prespa Minnow (*Pelasgus prespensis)*, (Habitats Directive, Annex II, species code **6264**)
Prespa Roach (*Rutilus prespensis)*, (Habitats Directive, Annex II, species code **5343**)
Prespa Trout (*Salmo peristericus)*, (Habitat Directive, Annex II, species code **5355**)
Dice Snake *(Natrix tesseleata)*, (Habitats Directive, Annex II and IV, species code **1292**)
Macedonian Crested Newt *(Triturus macedonicus)*, (Habitats Directive, Annex II and IV, species code **5364**)

Birds Directive species:
Common Kingfisher *(Alcedo atthis)*, Great egret *(Ardea alba), Squacco Heron *(Ardeola ralloides)*, Little Egret *(Egretta garzetta)*, Pygmy Cormorant *(Microcarbo pygmaeus)*, Dalmatian Pelican *(Pelecanus crispus)***

Assessment:
Water quality is declining due to eutrophication, the use of pesticides and the shortages on sewage systems, also the water level has become lower due to irrigation. However, the bird populations, especially of wintering birds, are still representative and stable. Conservation status is now slightly unfavourable, deteriorating.

The semi-natural dry terrestrial ecosystem:

Habitats: (Habitats Directive, Annex I):
6260* Pannonic sand steppes,
6220* Pseudo-steppe with grasses and annuals of the Thero-Brachypodietea.

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Fauna (animal) species:
Herman's Tortoise *(Testudo hermanni)*, (Habitats Directive, Annex II and IV, species code **1217**)
Common Wall Lizard *(Podarcis muralis)*, (Habitats Directive, Annex IV, species code **1256**)
Erhard's Wall Lizard *(Podarcis erhardii)*, (Habitats Directive, Annex IV, species code **1238**),
Balkan Wall Lizard *(Podarcis tauricus)*, (Habitats Directive, Annex IV, species code **1248**)
Three Lined Lizard (*Lacerta trilineata)*, (Habitats Directive, Annex IV, species code **1251**)
Balkan Green Lizard (*Lacerta viridis)*, (Habitats Directive, Annex IV, species code **1263**)
Cerambyx Longicorn (*Cerambyx cerdo)*, (Habitats Directive, Annex IV, species code **1088**)

Assessment:
Pannonic sand steppes can be found in the Republic of North Macedonia only in Prespa Lake area, so the importance of this area is significant for conserving this habitat type in all. The quality of the habitats is versatile; some parts are in good condition, but overgrowing is reducing the nature values in almost all sites. Pseudo-steppe habitats are mainly present in areas outside of Prespa Lake Nature Monument (on the eastern shore of the lake) and not very representative. The intensity of grazing is nowadays low, but other human impact, e.g. sand excavation and dumping of different kind of waste is clearly affecting the habitats negatively. Conservation status is now unfavourable, deteriorating.

The running water and wetlands ecosystems:

Habitats: (Habitats Directive, Annex I):
3260 Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation.
3290 Intermittently flowing Mediterranean rivers of the Paspalo-Agrostidion.
3270 Rivers with muddy banks with Chenopodion rubri p.p. and Bidention p.p. vegetation.
7220* Petrifying springs with tufa formation (Cratoneurion).
92A0 Salix alba and Populus alba galleries.
91E0* Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae).

Remark: all these habitats cover small fragments in the site.

Fauna (animal) species:
Prespa Trout (*Salmo peristericus)*, (Habitats Directive, Annex II, species code **5355**)
European Tree Frog *(Hyla arborea)*, (Habitats Directive, Annex II and IV, species code **1203**)
Agile Frog (*Rana dalmatina)*, (Habitats Directive, Annex II and IV, species code **1209**)
Dice Snake (*Natrix tesseleata)*, (Habitats Directive, Annex II and IV, species code **1292**)
European Pond Terrapin (*Emys orbicularis)*, (Habitats Directive, Annex II and IV, species code **1382**)

Birds Directive species:
Common Kingfisher *(Alcedo atthis)*

Assessment:
Only small patches of the running water and wetland ecosystems are left, and their conservation value is relatively low, even though these areas are valuable for numerous species. The effects of human impact can be observed in all areas. Conservation status is now unfavourable, deteriorating.

Grouping of key nature values (particularly habitats) in defined key ecosystem types help not only in the process of proposing common objectives and identifying management measures, but also help identifying main ecosystems (in the area). Particularly this is very helpful until habitats have been mapped. Aquatic ecosystems occupy the whole Prespa Lake. Running water and wetlands ecosystems occupy rivers, streams and forests. And all other areas in Prespa Lake NM, and in the surroundings of the Lake, are mainly covered by semi-natural dry

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terrestrial ecosystems. The Prespa Lake with **12 habitats** of the Habitats Directive Annex I, **41 species** protected by Annex II and IV of the Habitats Directive, and **13 bird species** protected by the Birds Directive, as well as a large amount of endemic species of the aquatic ecosystem, makes Prespa Lake an unique lake in Europe with high conservation values.

3.2. Threats and pressures

Threats to protected habitat types and species are identified within and outside of the Prespa Lake NM. The evaluation of threats and pressures is based on the result of the METT workshop were personnel from the Prespa Lake NM administration and other stakeholders were involved. The outcome of the event has been transformed into the classification used in Standard Data Form (SDF) for Natura 2000 sites. This can be found in the Reference Portal for Natura 2000 (http://cdr.eionet.europa.eu/help/natura2000). Threats and pressures are presented for each of the main groups of values of the area.

3.2.1. Threats and pressures to aquatic ecosystems and depending fauna species

Assessed threats to freshwater habitats of standing water – habitats type *3150 Natural eutrophic lakes with Magnopotamion or Hydrocharition* – type, shores, also the protected plant species: *Aldrovanda vesiculosa* L. and *Lindernia procumbens* L., fauna species Otter *(Lutra lutra)*, Prespa Spined Loach *(Cobitis meridionalis)*, Prespa Minnow *(Pelasgus prespensis)*, Prespa Roach *(Rutilus prespensis)*, and Prespa Trout *(Salmo peristericus)*, Dice Snake (*Natrix tesseleata)*, Macedonian Crested Newt *(Triturus macedonicus)*, and Birds Directive species: Pygmy Cormorant *(Microcarbo pygmaeus)*, Dalmatian Pelican *(Pelecanus crispus)*, Little Egret *(Egretta garzetta)*, Great Egret *(Ardea alba)**, Squacco Heron *(Ardeola ralloides)*, Black-winged Stilt *(Himantopus himantopus)*, Common Kingfisher *(Alcedo atthis)*, and the wintering water bird populations found in the Prespa Lake are:

A07	Use of biocides, hormones and chemicals in agriculture	high
A08	Fertilization in agriculture	high
F02.01.02	Fishing and harvesting aquatic resources – netting	low
F03.01	Hunting	low
G01	Outdoor sports and leisure activities, recreational activities	low
H01	Pollution to surface waters (limnic, terrestrial, marine & brackish)	high
H02	Pollution to groundwater (point sources and diffuse sources)	low
I01	Invasive non-native species	high
J01.02	Fire “illegal” (and fire suppression)	medium
J02	Human induced changes in hydraulic conditions	high

Eutrophication due to influx of nutrients from catchment areas in Resen, and from nearby countries, is a major threat to the Prespa Lake. Eutrophication leads to decreased water transparency and increased competition between submerged vascular plants and phytoplankton algae. The lake receives unprocessed or insufficiently processed sewage and urban waste water from nearby settlements or towns (e.g. Resen). Significant quantities of pesticides and fertilizers originating from agricultural activities are transported by the rivers Golema Reka and Istochka Reka. Diffuse input of pesticides and fertilizers via the underground waters through the porous alluvium soils is also a significant factor. However, there is no exact data about the quantities. Eutrophication caused by human disturbance is an ongoing process in the lake, and this influence the conservation value of the area. Invasive species is also a severe threat to the lake. There are several invasive fish species which can be harmful to endemic species and ecosystem functions. Also the recently observed Canadian waterweed *(Elodea Canadensis)* can increase the eutrophication problem. In dry years illegal fires can increase nutrient loads to the lake.

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3.2.2. Threats and pressures to natural and semi-natural dry ecosystems and depending fauna species

Assessed threats to natural and semi-natural grassland ecosystem habitat types: *6220* Pseudo-steppe with grasses and annuals of the Thero-Brachypodietea, 6260* Pannonic sand steppes,* fauna species Herman's Tortoise *(Testudo hermanni)*, Common Wall Lizard *(Podarcis muralis)*, Erhard's Wall Lizard *(P. erhardii)*, Balkan Wall Lizard *(P. tauricus)*, Caspian White Snake *(Dolichophis caspius)*, Three Lined Lizard *(Lacerta trilineata)*, Balkan Green Lizard *(L. viridis)*, bird species Red-backed Shrike *(Lanius collurio)*, are:

A04.03	Abandonment of pastoral systems, lack of grazing	medium
A06	Annual and perennial non-timber crops	medium
A07	Use of biocides, hormones and chemicals in agriculture	medium
C01.01	Sand and gravel extraction	medium
E03.01	Disposal of household / recreational facility waste	medium
G01	Outdoor sports and leisure activities, recreational activities	low
I01	Invasive non-native species	medium
J01.02	Fire "illegal" (and fire suppression)	medium

Overgrowing with shrub and trees is the main threat for these valuable areas. Termination of or decreased traditional land use, especially ceased grazing, causes dry grasslands overgrow with different species of shrubs, depending on ecological conditions, dominated by *Juniperus spp*., *Pteridium aquilinum*, *Rubus spp., Prunus spp*. and *Rosa spp*. Especially unfavourable if invasive non-native species take over, e.g. *Robinia pseudacacia, Amorpha fruticose, Ailanthus altissimus*.

Processes of turning original grassland habitats into agrarian territories are continuing even inside the protected area. Establishment of new apple orchards physically destroys habitat types. These activities are only marginally controlled and mainly illegal. Sand excavation is also occurring within the protected area on many locations, and seems to be a common practice around local villages. Usually these sites are used as dumping places after this use. Depositing waste near all settlements is a common practice over the whole area. This waste can be poisonous, pollute the soil groundwater and surface water bodies, increase the risk for protected species and it makes it more difficult to manage habitats. It also diminishes the recreational and tourism value of the area.

3.2.3. Threats and pressures to running water and wetlands ecosystems and depending fauna species

Assessed threats to freshwater habitats of running water habitat types*: 3260 Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion, 3290 Intermittently flowing Mediterranean rivers of the Paspalo-Agrostidion, 92A0 Salix alba and Populus alba galleries,* fauna species Otter *(Lutra lutra)*, European Tree Frog *(Hyla arborea)*, Agile Frog *(Rana dalmatina)*, Dice Snake *(Natrix tesselata)*, plant species *Aldrovanda vesiculosa*, *Lindernia procumbens* L, bird species: Kingfisher *(Alcedo atthis)*, Black-winged Stilt *(Himantopus himantopus)*:

A04.03	Abandonment of pastoral systems, lack of grazing	low
A06	Annual and perennial non-timber crops	medium
A07	Use of biocides, hormones and chemicals in agriculture	high
A08	Fertilization in agriculture	high
B02.04	Removal of dead and dying trees	medium
E03.01	Disposal of household / recreational facility waste	medium
H01	Pollution to surface waters (limnic, terrestrial, marine & brackish)	high
I01	Invasive non-native species	medium
J01.02	Fire "illegal" (and fire suppression)	low
J02	Human induced changes in hydraulic conditions	medium

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Assessed threats to alluvial forests *91E0* Alluvial forests with Alnus glutinosa and Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) and small water bodies important to amphibians and reptiles are:

B02.04	Removal of dead and dying trees	medium
E03.01	Disposal of household / recreational facility waste	low
I01	Invasive non-native species	low
J01.02	Fire "illegal" (and fire suppression)	low
J02	Human induced changes in hydraulic conditions	high

A decline in the ground water level is the main cause of wetland habitat loss. This is related to irrigation and intensive use of water in apple orchards, as well as changes in climate and geological conditions. Large areas of wetland have also been converted to apple orchards in and outside the borders of Prespa Lake NM. Decrease of traditional land use practices, especially ceased grazing, leads to overgrowth of wet areas, especially with different species of *Salix sp*. bushes or trees, and sometimes even with invasive species. Illegal felling of trees (other than invasive species) destroys forest habitats. Especially the habitat type *91E0* Alluvial forests with Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) is in poor quality. Felling old trees and removing dead wood destroys suitable habitats for protected insect species.

3.3. Management effectiveness and competences

The Management Effectiveness Tracking Tool (METT) is one of the two most widely used, or globally adapted, applicable generic systems developed to assess the effectiveness of protected area management. It is used to report progress towards the Convention on Biological Diversity. The methodology is a rapid assessment based on a scorecard questionnaire. The scorecard includes all six elements of management identified in the IUCN-WCPA. Framework, namely: context, planning, inputs, process, outputs and outcomes, with emphasis on context, planning, inputs and processes. The tool is basic and simple to use, and provides a mechanism for monitoring progress towards more effective management over time. It is used to enable protected area (PA) managers and donors to identify needs, constraints and priority actions, to improve the effectiveness of protected area management.

Results of METT assessment were discussed and agreed at the workshop with personnel of Prespa Lake NM administration and stakeholders**.** The workshop was organised by Resen municipality with the support of PONT (Prespa Ohrid Nature Trust).

According to this METT evaluation, the total score for Prespa Lake NM was 44 points out of the maximum possible 99 points. The results have previously been 48 points, in an evaluation performed some years ago. When evaluating the results by each individual element, the context gave the highest ranking 3 out of 3, due to a clear legal status of the area. Other key elements, like planning, input and processes gave levels of approx. 40 % of the maximum level. As a summary of the outcomes, this evaluation indicate that "Some of the biodiversity, ecological and cultural values are being partially degraded, but the most important values have not been significantly impacted". The results of METT analysis for Prespa Lake NM presented in ANNEX 4.

However, it is here important to give a remark; this evaluation is not based on a full understanding of the requirements for implementing the Habitats and Birds Directives in Prespa Lake NM. It mainly brings up the requirements for the management of the area as a nature monument, with an existing working environment. Moreover, the need for sustainable funding from the government is not addressed enough. And in addition, the capacity in law enforcement and in handling ecological issues by the administration has to be strengthened.

4. Strategy

The Prespa Lake and its surroundings with **12 habitat types**, at least **41 species** of Annexes II and IV of the Habitats Directive, and **13 bird** species protected by the Birds Directive, all being important at European Community level, should be protected by both relevant EU directives (Habitats Directive and Birds Directive). This area fulfils the requirements of the Habitats Directive as a Site of Community Importance (SCIs), justified by the presence of 15 species included in Annex II of the Habitats Directive, inhabiting terrestrial and aquatic habitats, and several endemic species inhabiting the Prespa Lake aquatic ecosystem. This strongly supports that

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Prespa Lake NM and its surroundings should, upon the agreement of the European Commission, be established as Special Area of Conservation (SAC) under the Habitats Directive, as well as Specially Protected Area (SPA) under the Birds Directive.

Most of the biodiversity values concerning habitats, and most species of the Habitats Directive, are present in Ezerani Nature Park as well. Therefore, this Strategy can also be applied for Ezerani Nature Park.

4.1. Common Vision for the future of the potential "Prespa Lake" Natura 2000 site

The vision is:

> Prespa Lake and its shores is an area maintaining high nature value for the European Community. The conservation status of all habitats, and species protected by Habitats and Birds Directives, is favourable. Human activities are in harmony with natural processes, visitors enjoy the possibilities for sustainable eco-tourism and healthy environment. The Natura 2000 sites create additional economic benefits both for local people and communities.

Moreover:

Biodiversity *– nature values of national and European Community Importance naturally coexists in the same area. Natural habitats and populations of protected species are stable and the quality of the water is improved. Invasive species does not cause harm for natural species and habitats any more.*

Prespa Lake with its environment may be considered a nature school, where ***visitors*** *can learn, and understand the necessity for, to protect all types of habitats and species together with a possibility to stay and enjoy a clean, healthy and quiet environment. Basic visitor facilities are available.*

Prespa Lake is a source of pride and appreciation. The area offers opportunities for traditional grazing practices and production of ecologically friendly food. ***Local communities*** *are directly involved in the management of Natura 2000 sites and values. EU funds for management activities are available for farmers. Eco-tourism together with a clean and healthy environment creates additional economic benefits for the local people and communities.*

Resen municipality *has motivated and professional staff managing the area effectively. Scientific and education activities are established, hereby giving possibilities for a deeper understanding and appreciation of Natura 2000 site values. All stakeholders are involved in protection and management of habitats and species.*

4.2. Mission of Resen municipality and other involved institutions

Resen municipality – the managing authority of Prespa Lake NM / potential "Prespa Lake" Natura 2000 site of European Community Importance, ***ensures*** that:

> Protected nature values of the area are used and enjoyed by the community in a good manner, ensuring that such approach will be applied by future generations, and;
>
> Protected nature values of the area create benefits for people of three countries located around the lake.

The other institutions using the resources of Prespa Lake NM/potential Natura 2000 site ***understand*** the values of European Community Importance and ***cooperate*** with Resen Municipality, supporting the activities necessary for protection of nature values, creating clean and healthy environment and additional economic benefit for the local people, communities and visitors.

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4.3. Protection and management goals and objectives

Goal: To protect biodiversity – nature values of European Community Importance taking into account the needs of local communities.

The objectives for protection of Prespa Lake NM biodiversity – nature values of European Community Importance, are presented in the table below:

Goal	Ecosystem	Objectives
To protect nature values of EU Importance taking into account the needs of local communities	Aquatic ecosystems, habitats and species	To ensure proper protection of water bird species, eliminating threats and pressures on water quality, the ecosystem, habitats and species
	Dry terrestrial ecosystems, habitats and species	To ensure favourable conservation status and management regime in dry land habitats, eliminate threats and pressures on the ecosystems, habitats and species
		To recover and restore semi-natural habitats of dry land
	Running rivers and wetlands ecosystems, habitats and species	To ensure favourable conservation status of habitats and species living in running rivers and wetland ecosystems, eliminating threats and pressures on ecosystems, habitats and species

The proposed goals and objectives are applicable for the protected species under the National List as well.

4.4. The necessary pre-requisites for protection of biodiversity – nature values of European Community Importance

The following pre-requisites (conditions) are necessary for management of the area in order to fulfil the vision and the management goals and objectives, and to be able to implement the measures identified in the document (Annex). Some of the issues listed below can be seen as functions of PA administration, the Department for Environment of Resen municipality, whereas some are describing the working approach and practises of the administration and its personnel. Defining the pre-requisites help in identifying the additional management measures needed for management of Natura 2000 site. The most important prerequisites are:

Permanent funding sources are available from state budget, Resen municipality, UNDP, PONT and other funds, additional funding by national and international projects, donors and programs are available as well.

Data necessary for management of the site are collected, GIS databases exists.

The Ministry of Environment and Physical Planning (MoEPP), Ministry of Agriculture, Forestry and Water Economy (MAFWE), as well as other relevant ministers support the activities of Resen municipality in management of Prespa Lake NM.

The protected area (PA) management is based on a participatory approach. A Council of Stakeholders supports the implementation of the management measures. Continuous cooperation and communication with different stakeholders is ensured;

The competent inspection bodies, authorities responsible for the protection and use of forests, pastures and other natural resources, and for planning and maintaining the roads and other public infrastructure (such like Agency of pastures, Association of Orchards, Agency for Support and Development of Agriculture, Local Fishery Organization, Tourism development associations, etc.);

professional and scientific organizations at international, national, regional and local levels;

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local organizations, citizens, NGO's;

planners preparing detail and other plans;

tourism organizations and operators, local sports associations, sport, fishing and hunting clubs.

A Scientific Committee is functioning giving proposals for protection/management of habitats and species. PA administration influences the agriculture, land use and water management practices in the whole watershed area, negative impact is diminished.

Practices for appropriate assessment of plans and projects possibly having negative impact for the values is applied, and continuous monitoring of the impact is running with sufficient capacity within the PA administration.

Possibilities for people to get resources like e.g. sand for construction and farming activities Areas for waste management are created outside Prespa Lake NM and its surroundings.

Law enforcement is guaranteed, effective patrolling implemented for control of illegal digging and littering, illegal fishery and hunting activities, as well as a fire control in place.

Raised awareness of visitors, farmers and local communities on the importance of protection of nature values of European Community Importance, and on the benefits of Natura 2000 site establishment, including sharing information on the opportunities to join and participate in the protection and management of the site.

4.5. Borders and zones of the proposed "Prespa Lake" Natura 2000 site

As stated in chapter 3.1.1., the Prespa Lake NM (together with surroundings), including 12 habitats of the Habitats Directive Annex I, 41 species protected by Annex II and IV of the Habitats Directive, 13 bird species protected by the Birds Directive, as well as a large amount of endemic species of the aquatic ecosystem, makes Prespa an unique lake in Europe. The demonstrated high conservation values in the area makes a good base for adequate decision on the possible borders for establishing a Natura 2000 site. Different options could be suggested, but during the Twinning project it was decided to propose two Natura 2000 sites in the area:

1. "Prespa Lake" Natura 2000 site, including Prespa Lake NM and Ezerani Nature Park (the borders of the potential Natura 2000 site are illustrated in Figure 7);
2. "Golem Grad Island" Natura 2000 site (inside the borders of Golem Grad Island).

Separate SDF's for proposed Natura 2000 sites, Prespa Lake NP together with Ezerani Nature Park and another on for Golem Grad Island, are prepared and presented as ANNEX 1 and 2.

The identified Nature Values of the western shores of Prespa Lake belonging to the Galicica National Park might be protected inside the "Galicica" Natura 2000 site. Proposals made by previous projects on the borders of Galicica Natura 2000 site do not correspond with the high values of the area along Prespa Lake. This might be revised when preparing a SDF for the area.

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Figure 7. Proposed preliminary borders of a potential "Prespa Lake" Natura 2000 site

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The proposed Natura 2000 site "Prespa Lake" might include not only Prespa Lake, but also the eastern shores, i.e. the areas around Krani, Štrbovo and Nakolec until the border of Greece and until the highway between Resen and Greece, as shown in figure 6. The reconstruction area of the highway might be excluded from the Natura 2000 site, but protection measures (like special barriers, fences, etc.) for e.g. moving reptiles might be applied during reconstruction of the existing road.

The eastern shores of Prespa Lake, especially around Krani, Štrbovo and Nakolec, are very valuable sites for protection of the following priority habitat types of Annex I: *6260* Pannonic sand steppes* and *6220* Pseudo-steppe with grasses and annuals of the Thero-Brachypodietea*. A few, but not very representative, pseudo-steppes are located in this area. However, these habitats are connected to very representative pseudo-steppes in the western slopes of Baba Mountains between Prespa Lake NM and Pelister National Park. In addition to these habitat types, the Prespa Lake NM surroundings are important for many Habitats Directive reptiles and amphibians. Therefore, this area is recommended to be included in the potential Natura 2000 site "Prespa Lake".

All proposed areas are valuable in the context of conservation of habitats and species protected both by the Habitats and Birds Directives.

In addition, in the future it is important to plan and construct ecological corridors between the proposed Prespa Lake Natura 2000 area and Pelister National Park, through areas with riparian habitats, oak forests and actively grazed grasslands with high biodiversity value. Restoration, management and preservation of riparian habitats is important for maintaining the biodiversity values both in Prespa Lake NM and Pelister National Park.

The present zonation of Prespa Lake NM, especially the borders of different zones do not play an important role in implementation of the requirements of the Habitats and Birds Directives. But in contrast, it would be important to define concrete management principles for each habitat type, thereby securing that the habitats and species of European Community Importance maintain a favourable conservation status. This approach should be integrated into the regulation and description for the different zones. If there would be a threat to the conservation of a particular habitat or species, urgent active measures should be implemented not only in the active management zone, but also in zones for sustainable resource use, and even in strict protection zones. And contrary, any negative development activity should be prohibited also in zones of sustainable resource use, where habitats might exist in small fragments. This could e.g. be habitats of running rivers and wetlands.

The strict protection zones in Prespa Lake NM occupy only a very small area, so they don't here play an important role in protecting nature values of European Community Importance. In general, strict protection zones are not necessary for protection of EU nature values, but an exception could be the area around the Golem Grad Island. In this case establishment of a strict protection zone would be helpful in regulation fishing and recreational activities. Fishing activities could e.g. be prohibited in a zone 200 m around the island. Visits to the island should be very strictly regulated, e.g. prohibiting visits to the island and use of the waters around (200 m around) during the breeding period for birds.

At the moment, the surroundings of Prespa Lake NM do not have any special regulations. If it will become a part of a Natura 2000 site, the principles described above should be applied. The nature values of the habitats and species of EU importance should be protected and disturbances kept to a minimum. It is advisable to integrate this valuable area as a part of Prespa Lake NM, in order to give legal national protection to the area.

5. Management Plan for the area

5.1. Management principles and recommendations

Management principles are general guidance for management of nature values in an area, and supports the goal of achieving favorable status for habitats and species. Implementing sound and clear management principles is the easiest way to achieve those goals. Some habitats and species do not need much or any intervention, but some of them need quite active management. Management principles are also different for different nature values (habitats, species). Activities, like measures for protection, maintenance or restoration should be based on well-defined management principles. Understanding management principles also helps in the process of proposing additional immediate measures (not mentioned in the Annex) for protection of nature values.

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5.1.1. Aquatic ecosystem, habitats and species management principles

- The management of Prespa Lake should be based on careful planning by the municipality of Resen, together with environment specialists and representatives of all stakeholders around the lake, using the guidelines defined in Prespa Lake Watershed Management Plan. Water quality monitoring should be based on the requirements of the Water Framework Directive.
- Management plans should support all actions which would decrease eutrophication and nutrient accumulation from whole catchment area, which would decrease the leakage of fertilizers from, and use of pesticides in agriculture, as well as all possible solutions solving conflicts between present land use and conservation measures. Especially solutions that would reduce water use for irrigation would be beneficial for the aquatic ecosystem, habitats and species.
- Management of reedbeds in a way that would decrease accumulation of organic material and nutrients at the lake, are necessary. E.g. removal and thinning of dense stands of reeds by mowing or grazing, so that clearings are formed in shallow shoreline water, would be beneficial for the Waterwheel Plant *(Aldrovandra vesiculosa)*. Removing of reeds could be done at particular reed bed locations around the lake based on detailed and careful planning. Excavation of artificial shallow pools in shoreline reed bed areas might be an efficient management measure, and would give benefits for several plants and fauna species, i.e. those inhabiting occasionally inundated habitats with high conservation value. Illegal burnings should be prohibited and under strict control.

5.1.2. Semi-natural dry terrestrial ecosystems, habitats and species management principles

- The main management principle for semi-natural dry terrestrial ecosystems (mainly habitat types 6220 and 6260) is to protect them from overexploitation and destructive intervention on one hand, and from overgrowing on the other hand. Illegally established orchards should be removed, and the sites restored into a natural state again. The same applies for areas used for excavation of sand and dumping of waste. Invasive species, especially *Robinia pseudacacia* should be totally removed, and the removal of bushes and/or Junipers *(Juniperus spp.)* is needed in overgrown areas. Traditional low pressure grazing is recommended for the preservation of nature values in rural landscapes, but overgrazing should be avoided. In general, these habitat types benefit from some kind of human induced disturbance, e. g. trampling. Moderate amount of trampling by tourists and local people is mostly positive for these habitat types under protection.
- Maintenance of open meadow areas, avoiding overgrowing, and especially keeping rocky meadows open benefit several Habitats Directive species.
- Some of sites on sandy locations that have been badly overgrown by shrubs and grasses, could be restored by grazing, and therefore it would be possible to increase the area of this habitat type in and around Prespa Lake NM.

5.1.3. Running rivers and wetlands ecosystems, habitats and species management principles

- There are four habitat types related to streams and rivers (3260, 3270, 3280 and 3290). The main management principle for these areas should be to avoid all human induced disturbances, and leave them intact, with uninterrupted natural succession and interaction with their surroundings. Excavation, road construction, tree-felling (with exception of invasive tree species), and other activities should be avoided close to these areas. Any possibilities for restoration of degraded areas should be investigated and necessary measures implemented whenever possible.
- All measures which could prevent accumulation of sediments into natural brooks and streams, decrease eutrophication and pollution caused by agricultural and communal wastes, including untreated wastewaters, are positive. More attention should also be paid to improving water quality and conservation status of habitats, especially in the streams between Prespa Lake and Pelister National Park where the Prespa Trout spawns. These areas, functioning as ecological corridors, should be included in conservation areas together with the whole riparian vegetation, including strips of vegetation in river valley areas. The condition of these streams might

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need to be improved by restoration/management actions as needed. The effect of hydropower plants on biodiversity should be evaluated and negative impacts need to be compensated.

- For alluvial forests (habitat 91E0) it is important to create conditions for near to natural dynamics, and increase the amount of old trees and decaying wood by management actions if possible. These forests should not be cut for firewood or other purposes. If the hydrology has been altered, restoration measures are needed.
- Sites hosting populations of the European Tree Frog *(Hyla arborea)* should mainly be saved as they are. In some cases, restoration activities can be used to support the viability of the populations. This could e.g. be done by constructing small artificial waterbodies to strengthen small and local frog populations.
- Important habitats for tortoises should be taken into account when making land use plans. Roads should not divide important population sites. Man-made fires should not be allowed in habitats and areas important for tortoise populations.
- The habitats hosting Dice Snake populations should be kept very close to those under natural conditions. Off-road driving with motor vehicles should be avoided close to shore areas. Building activities should also be avoided close to important sites for the snake populations.

5.2. Management objectives and corresponding measures

Objectives for protection of Prespa Lake NM (potential Natura 2000 site) biodiversity – nature values – habitats and species of European Community importance and corresponding measures.

Ecosystem	Objectives	Measures
Aquatic ecosystems, habitats and species	To ensure proper protection of water bird species, eliminating threats for and pressures on water quality, the ecosystem, habitats and species	1. Creating good habitat conditions for water birds (*Crispy pelican, Pigmy cormorant*) and for wintering birds
Dry terrestrial ecosystems, habitats and species	To ensure favourable conservation status and management regime in dry terrestrial habitats, eliminating threats and pressures for the ecosystems, habitats and species	2. Removing surplus woody vegetation, invasive species from natural and semi-natural grasslands
		3. Extending appropriate grazing in natural and semi-natural grasslands
	To recover, restore semi-natural habitats of dry land	4. Mitigating the consequences of illegal actions
Running rivers and wetlands ecosystems, habitats and species	To ensure favourable conservation status of habitats and species of running rivers and wetlands ecosystems, eliminating threats and pressures on the ecosystems, habitats and species	5-6. Implementing specific measures for protected species habitats (managing reedbeds on the shores of Prespa Lake, small water bodies; old trees)

5.3. Specification of proposed measures (and sub-measures) and indicators

5.3.1. Creating good habitat conditions for water birds (the Crispy Pelican, Pigmy Cormorant) and for migratory and wintering birds

Proposed measures with explanation:

- Supplementing existing legal acts and agreements regulating fisheries in Prespa Lake, with the purpose of reducing disturbances for water birds and fish-net killing. This includes: setting terms for fish-net use and introducing non-fishing zones based on the requirements of protected breeding bird species populations, and distribution data on the concentrations of migrating and wintering bird species.

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- Implementing and enforcing rules for boat use in the Lake for tourism purposes. Introducing limitations for using sailing boats around Golem Grad Island, in a zone no less than 200 m from land with a purpose of reducing disturbance on the Dalmatian Pelican, Pigmy Cormorant and other birds. The non-sailing zone of 200 m should be marked with buoys around Golem Grad Island.
- Preparing and implementing a monitoring program for recording numbers and distributions of breeding and wintering bird populations.

Indicators of implementation: Fishing regulation acts taking into account the needs of breeding and wintering birds are approved. Rules for using boats in the Prespa Lake for tourism purposes supplemented, area around Golem Grad Island marked. Observations of increased populations of the Dalmatian Pelican and Pygmy Cormorant around Golem Grad Island have been made. As well as an observed increase in the number of wintering birds.

5.3.2. Removing surplus woody vegetation and invasive species from natural and semi-natural grasslands

Proposed measures with explanation:

- Cutting and removing shrubs and trees from areas of semi-natural grassland habitat types, except a small number of shrubs, but keeping all old native trees, which are important elements of biodiversity.
- Cutting and removing all invasive tree species from all grasslands and adjacent areas and executing continuous control of regrowth. The removal of invasive species could be combined with intensive grazing (observe toxicity of invasive *Xanthium* species for domestic animals).
- Preparing a special study for biomass fuel use, with evaluation of appropriate technical equipment, needs of the municipalities, investment costs and requirements for selecting company, actions, etc., and implementing it.

Indicators of implementation: area cleared from invasive species and surplus woody vegetation, special study prepared and implemented.

Further resources:
https://www.europarc.org/wp-content/uploads/2015/05/Guidelines_Setting-up-a-wood-biomass-chain.pdf
https://europa.eu/investeu/projects/renewable-energy-woodchips_en
http://ec.europa.eu/environment/nature/natura2000/management/habitats/pdf/6220_Pseudo_steppe.pdf

5.3.3. Extending appropriate grazing in natural and semi-natural grasslands

Proposed measures with explanation:

- Continuous grazing in natural and semi-natural grassland habitat – steppe, and especially in the pseudo steppe habitat type. Also in related habitats in adjacent areas, but not those covered by forests habitat types.
- Preparing and approving a defined grazing program for all semi-natural grassland habitat types, which specifies delimited grazing areas within habitats, number of livestock, grazing terms and criteria for measuring the outcome and efficiency of the management according to ecological criteria. This should also include monitoring the success of the grazing activity, indicated by e.g. positive and negative indicator species, size of areas with damaged soil, sward height and amount of dead plant material, actual size of the area used for grazing.
- Organizing activities to promote grazing: leaflets, seminars, meetings with (especially) local people; selecting grazing operators, signing contracts, monitoring activities within the grazing programme.

Indicators of implementation: Grazing programme for semi-natural habitats prepared and implemented. The condition of semi – natural grasslands habitats recognised as good.

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5.3.4. Mitigating the consequences of illegal actions

Proposed measures and explanation:

- preparing a "Damaged Areas" restoration program, which covers:
  - determining suitable areas for restoration, including size of illegal orchards, sand quarries, dumping grounds within Prespa Lake NM and in its surroundings;
  - determining costs and responsible organizations for implementation of actions;
- proposing and executing information campaigns for local communities;
- proposing and executing campaigns using signs and information stands for rising awareness, responsibility and consequences when littering areas, etc.

Indicators of implementation: No new orchards established, neither new sand quarries nor dumping grounds within Prespa Lake NM and its surroundings detected. Areas destroyed by quarries are restored, waste have been removed.

5.3.5. Implementing specific measures for habitats of protected species in the reedbeds on shores of Prespa Lake

Proposed measures with explanation:

- For the management of reedbed vegetation growing in shallow littoral zone of Prespa Lake an action plan should be prepared and implemented. This could be based on an adopted "Conservation Action Plan for Reedbeds in the Prespa lakes watershed", where the following special actions are proposed: creating a common database, reedbed management according to the needs of the most endangered parts fauna species, such as Bittern, Ferruginous Duck, Purple Heron, Great White Egret, Otter, etc.
- Management of reedbed vegetation on dry or wet soils of Prespa Lake shore: annual cutting of reeds during winter time in Prespa Lake, and grazing on previously cleaned areas. At the same time a special study has to be prepared to identify selected of reedbed areas for active management, setting technical conditions for reed cutting, investigate possible proper uses of the collected yield biomass (e.g. for heating or thatching).

Indicators of implementation: An action plan and study of reedbed vegetation management at the shores of Prespa Lake are prepared and implemented. Reedbeds are managed according to the needs of protected species.

5.3.6. Implementing specific measures for habitats of protected species in small water bodies and populations of old trees

Proposed measures with explanation:

- Measures covers inventory, mapping of all small water bodies, adjacent wetlands, more than 50 years old or large trees and their marking. The trees have to be preserved and left intact even after death to facilitate habitats for e.g. red listed beetles. Small water bodies and wetlands should be prevented from overgrowing and siltation, and this could be done by activities like grazing or removing woody vegetation. Local communities have to be informed and included in these actions.

Indicators of implementation: Small water bodies and old trees are registered and mapped. Proper management implemented.

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Summary of management measures, actions (priority actions), implementing institutions, and timetable for implementation of proposed management measures (5.3.1. – 5.3.6.). The years might be revised after approval of the document.

Management measures	Implementing institutions	Year									
		1	2	3	4	5	6	7	8	9	10
5.3.1. Creating good habitat conditions for water birds (the Crispy Pelican, Pigmy Cormorant) and for migratory and wintering birds											
*** Supplementing existing legal acts/ agreements regulating fisheries in Prespa Lake**	MoEPP, MAFWE										
*** Supplementing rules for using boats in the Prespa Lake for tourism purposes**	MoEPP										
*** Preparing and implementing a monitoring programme for recording the numbers and distributions of breeding and wintering bird populations**	MoEPP										
5.3.2. Removing surplus woody vegetation and invasive species from natural and semi-natural grasslands											
*** Cutting and removing shrubs and trees from areas of semi-natural grassland habitat types**	Resen municipality, farmers, etc.										
*** Cutting and removing all invasive tree species from all grasslands and adjacent areas**	Resen municipality, farmers, etc.										
Preparing a special study for assessment of the potential for biomass fuel use	Resen municipality										
5.3.3. Extending appropriate grazing in natural and semi-natural grasslands											
*** Continuous grazing in natural and semi-natural grassland**	Resen municipality, farmers, etc.										
Preparing and approving a grazing program for all semi-natural grassland habitat types	Resen municipality, Agency of Pastures										
Organizing grazing activities, promotion of actions	Resen municipality										
5.3.4. Mitigating the consequences of illegal actions											
Preparing a damaged areas restoration program and implementing proposed relevant actions	Resen municipality										
Installing signs and information stands on responsibility for littering of the area, etc.	Resen municipality										
5.3.5. Implementing specific measures for habitats of protected species in the reedbeds on shores of Prespa Lake											
Preparation and implementation of: "Management of reedbed growing on shallow littoral zone of Prespa Lake Action Plan"	Resen municipality										
*** Management of reedbed vegetation on dry or wet soils of Prespa Lake shore**	Resen municipality										
5.3.6. Implementing specific measures for habitats of protected species in small water bodies and populations of old trees											
Inventories, mapping of all small water bodies and adjacent wetlands, plus old (≥ 50 years)/ big trees and their marking	Resen municipality										

***** Priority measures (in bold)

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5.3.7. Other important measures to be implemented

Timetable for implementation of other important measures. The years might be revised after approval of the document.

Management measures	Implementing institutions	Year									
		2	2	3	4	5	6	7	8	9	10
Setting boundaries											
*** Setting the exact boundaries of the territory of Prespa Lake NM in GIS and marking them**	MoEPP										
Establishing boundaries for development of the settlements around Prespa Lake NM in the scope of making detailed spatial plans (to be in line with protection of habitats and species)	MoEPP										
Research, monitoring, establishing data bases											
Making Annual survey of wintering and breading birds	Resen municipality, NGOs involved										
*** Perform mapping of habitats**	MoEPP										
Creating data base on Natura 2000 habitats and species, including migrating species	MoEPP										
Monitoring habitats and species of EU importance	Resen municipality										
*** Creating a data base on ownership borders and other area use rights, with layers of spatial habitats and species information**	MoEPP										
Raising awareness and education											
*** Implementing raising awareness activities to influence the agriculture, land use and water management practices, including efficient waste water treatment in the whole watershed area aiming at protecting nature values; monitoring of the results awareness campaigns**	Resen municipality										
*** Implementing special educational programmes for local people and visitors**	Resen municipality										
Creating special info stands (displaying information on nature values of European Community importance), establishing observation points, marking trails, this with special attention to Golem Grad Island	Resen municipality										

***** Priority measures (in bold)

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Annexes

ANNEX 1. SDF of "Prespa Lake" potential Natura 2000 site

NATURA 2000 - STANDARD DATA FORM

For Special Protection Areas (SPA),
Proposed Sites for Community Importance (pSCI),
Sites of Community Importance (SCI)
and for Special Areas of
Conservation (SAC)

SITE **MK0000003**

SITENAME **Lake Prespa**

TABLE OF CONTENTS

1. SITE IDENTIFICATION

Back to top

1.1 Type	1.2 Site code
A	MK0000003

1.3 Site name

Lake Prespa

1.4 First Compilation date	1.5 Update date 15.07.2019

1.6 Respondent:

Name/Organisation:	Ministry of environment and physical planning
Address:	Bul. Goce Delcev no. 18, Skopje, R. Macedonia
E-mail:	

1.7 Site indication and designation / classification dates

Date site classified as SPA:	0000-00
National legal reference of SPA designation	No data

2. SITE LOCATION

Back to top

2.1 Site-centre location [decimal degrees]:

Lake Prespa Natura 2000 Standard Data Form Page 1 (15)

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Longitude
21.0273

Latitude
40.9255

2.2 Area [ha]:

19842.0

2.3 Marine area [%]

2.4 Sitelength [km]:

2.5 Administrative region code and name

NUTS level 2 code	Region Name
MK00	Macedonia

2.6 Biogeographical Region(s)

Alpine (100.0 %)

3. ECOLOGICAL INFORMATION

Back to top

3.1 Habitat types present on the site and assessment for them

Annex I Habitat types						Site assessment			
Code	PF	NP	Cover [ha]	Cave [number]	Data quality	A|B|C|D	A|B|C		
						Representativity	Relative Surface	Conservation	Global
3150			17630		G	B	A	B	B
3260			0,61		G	B	C	C	C
3270			0,1		M	C	C	A	B
3280			2,0		M	C	C	B	C
3290			3,0		M	C	C	B	C
5130			2,0		M	C	C	B	C
6260	*		195		G	B	A	B	B
6420			0,039		G	B	C	B	C
6430			384,14		M	B	C	B	B

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6510			125,364		M	C	C	C	B
7220	*		0,01		G	D	C	B	C
91E0	*		128,76		G	A	B	B	B
92A0			491,71		M	B	C	B	B

1) E3.31 Hey meadows (Helleno-Moesian riverine and humid Trifolium meadows) of MES are included into 6210 in SDF
2) 92A0. + Salix alba and Populus alba galleries are separated in here according to MES, but included into 91E0 in the fact sheet

3.2 Species referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive 92/43/EEC and site evaluation for them

Species					Population in the site						Site assessment			
G	Code	Scientific Name	S	NP	T	Size		Unit	Cat.	D.qual.	A|B|C|D	A|B|C		
						Min	Max				Pop.	Con.	Iso.	Glo.
B	A085	Accipiter gentilis			p	0	2	i	R	P				
B	A293	Acrocephalus melanopogon			r				R	DD				
B	A229	Alcedo atthis			p				R	DD	C	B	C	
P	1516	Aldrovanda vesiculosa	S		p			I	P	G	A	C	A	B
B	A051	Anas strepera			r	0	10	p		P	A	B	C	
B	A028	Ardea cinerea			p				P	G	C	C	C	
B	A029	Ardea purpurea			c	0	4	i		M	C	C	C	
B	A024	Ardeola ralloides			c	0	6	i		M	C	B	C	
B	A059	Aythya ferina			w	1850	3200	i		G	A	B	C	C
B	A060	Aythya nyroca			r	3	10	p		M	A	B	C	
A	1193	Bombina variegata			p	300	2000	I	R	M	C	B	C	B
B	A021	Botaurus stellaris			w	0	1	i		M	C	B	C	
M	1352	Canis lupus	s			0	5	i	V	P	D	C	C	C
I	1088	Cerambyx cerdo			p	1	15	i	p	DD	C	C	C	C

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B	A136	Charadrius dubius			r		50	p		P	A	B	C	
B	A196	Chlidonias hybridus			c					DD	C		C	
B	A197	Chlidonias niger			c	120		i		M	C		C	
B	A031	Ciconia ciconia			r				R	G	C	C	C	
B	A030	Ciconia nigra			c	0	2	i	R	M	C	C	C	
B	A080	Circaetus gallicus			c				P	DD	C			
B	A081	Circus aeruginosus			c				P	DD	C	C	C	
B	A081	Circus aeruginosus			c				R	DD	C	C	C	
B	A081	Circus aeruginosus			r				P	P	B	C	C	
B	A083	Circus macrourus			c				R	DD	C	C	C	
F	5310	Cobitis meridionalis			p				P	DD				
B	A036	Cygnus olor			w	0	8	i		G	C	B	C	
B	A036	Cygnus olor			r	0	1	p		M	A	B	C	
B	A429	Dendrocopos syriacus			p				P	DD	C	B	C	
B	A027	Egretta alba			c	60	150	i		M	B	B	B	
B	A027	Egretta alba			w	1	25	i		G	C	C	C	
B	A026	Egretta garzetta			c	0	130	i		M	B	C	C	
R	1279	Elaphe quatuorlineata			p				R	P	C	C	C	B
B	A381	Emberiza schoeniclus			p				R	DD	C	C	C	
R	1220	Emys orbicularis			p	1000	7000	I	C	M	C	B/C	C	A
B	A125	Fulica atra			w	3050	9750	i		G	A	B	C	C
B	A125	Fulica atra			r				P	DD				
B	A153	Gallinago gallinago			w	0	10	i		P	C	C	C	
B	A002	Gavia arctica			w	0	22	i		G	A	B	C	
B	A189	Gelochelidon nilotica			c	0	1	i		M	C	C	C	
B	A075	Haliaeetus albicilla			w	0	1	i		G	B	C	C	
B	A131	Himantopus himantopus			c				P	M	C	B	C	
B	A022	Ixobrychus minutus			r	50	200	p	P	P	A	B	C	
B	A338	Lanius collurio			r				P	DD				

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B	A339	Lanius minor			r				P	DD				
B	A604	Larus michahellis			r	50	50	p		G	A	B	C	
B	A604	Larus michahellis			p	18	73	i		M	A	B	C	
B	A292	Locustella luscinioides			r				P	DD				
I	1083	Lucanus cervus			p				R	P	C	C	C	C
M	1355	Lutra lutra			p	5	20	i	R	P	C	C	C	C
B	A068	Mergus albellus			w	0	1	i		M	C	C	C	
B	A070	Mergus merganser			w	2	22	i		G	A	A	A	
B	A070	Mergus merganser			r	30	50	p		G	A	A	A	
M	1310	Miniopterus schreibersii			p				P	DD				
M	1316	*Myotis capaccinii*			p				P	DD				
B	A058	Netta rufina			w	0	80	i		M	C	B	C	
B	A023	Nycticorax nycticorax			c	0	18	i		M	B	B	C	
I	1084	Osmoderma eremita			p	0	20	i	V	M				
B	A323	Panurus biarmicus			r		20	p		M	A	B	C	
B	A323	Panurus biarmicus			p	15	27	i		M	B	B	C	
B	A020	Pelecanus crispus			c	300	1000	i		G	A	B	A	
B	A019	Pelecanus onocrotalus			c	150	500	i		G	A	B	B	C
B	A017	Phalacrocorax carbo			r	2500	3000	p		G	A	B	C	C
B	A017	Phalacrocorax carbo			w	53	221	i		M	C	C	C	
B	A393	Phalacrocorax pygmeus			w	6	80	i		M	B	B	B	
B	A393	Phalacrocorax pygmeus			r	10	20	p		M	A	B	B	
B	A151	Philomachus pugnax			c	0	450	i		M	B	B	C	
B	A034	Platalea leucorodia			c	0	2	i		M	C	C	C	
B	A007	Podiceps auritus			w	0	1	i		G	A	B	C	
B	A005	Podiceps cristatus			w	2000	3400	i		G	A	B	C	C
B	A005	Podiceps cristatus			r	100	600	p		M	A	B	C	C

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B	A008	Podiceps nigricollis			w	1400	5800	i		G	A	B	C	B
B	A121	Porzana pusilla			r	0	1	p		P	A	C	C	
B	A132	Recurvirostra avosetta			c				R	M	C	B	C	
B	A336	Remiz pendulinus			r				R	DD	C	C	C	
M	1305	Rhinolophus euryale			p				P	DD				
M	1303	Rhinolophus hipposideros			p				P	DD				
F	5343	Rutilus prespensis			p				P	DD				
F	5355	Salmo peristericus			p				P	DD				
B	A195	Sterna albifrons			c	0	3			M	C	C	C	
B	A193	Sterna hirundo			c	0	60			M	C	C	C	
B	A210	Streptopelia turtur			r				P	DD				
B	A307	Sylvia nisoria			r				P	DD				
B	A004	Tachybaptus ruficollis			w	320	741	i		G	A	B	C	
R	1217	*Testudo hermanni*			p	5000	10000	i	C	G	C	B	C	B
B	A166	Tringa glareola			c	0	40	i		M	C	C	C	
A	5364	*Triturus macedonicus*			p				R	P	[1]B	B	C	B
B	A142	Vanellus vanellus			w	0	300	i		G	C	C	C	
B	A142	Vanellus vanellus			r	15	15	p		M	B	B	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 Standard list of population units and codes in accordance with Article 12 and 17 reporting (see reference portal)
- **Abundance categories (Cat.)**: C = common, R = rare, V = very rare, P = present - to fill if data 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); VP = 'Very poor' (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)

[1] The species is part of a species complex, the species of which have not been properly delimited in North Macedonia, and hybrid zones have not been assessed, thus this information should be taken with much care.

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3.3 Other important species of flora and fauna (optional)

Species					Population in the site				Motivation					
Group	CODE	Scientific Name	S	NP	Size		Unit	Cat.	Species Annex		Other categories			
					Min	Max		C|R|V|P	IV	V	A	B	C	D
R	1276	Ablepharus kitaibelii						P	X					
B	A086	Accipiter nisus			0	0		P					X	
B	A298	Acrocephalus arundinaceus			0	0		C					X	
B	A296	Acrocephalus palustris			0	0		P					X	
B	A295	Acrocephalus schoenobaenus			0	0		C					X	
B	A297	Acrocephalus scirpaceus			0	0		P					X	
B	A168	Actitis hypoleucos			0	0		P					X	
B	A324	Aegithalos caudatus			0	0		R					X	
F		Alburnoides prespensis						P				X		
F		Alburnus belvica						P				X		
R	1243	Algyroides nigropunctatus						R	/			/[4]		
B	A054	Anas acuta			0	30	i	R					X	
B	A056	Anas clypeata			0	1	i	R					X	
B	A052	Anas crecca			1	2520	i	P					X	
B	A050	Anas penelope			0	400	i	P					X	
B	A053	Anas platyrhynchos			203	1015	i	P					X	

[2] Endemic to the Balkan Peninsula

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B	A055	Anas querquedula			0	155	i	P					X	
B	A043	Anser anser			0	52	i	R					X	
B	A257	Anthus pratensis			1	2	i	P					X	
B	A259	Anthus spinoletta			0	1	i	R					X	
B	A061	Aythya fuligula			100	9000	i	C					X	
F		Barbus prespensis						P				X		
P		Beckmanni a eruciformis						R						X
I		Bithynia prespensis						P				X		
B	A067	Bucephala clangula			0	32	i	P					X	
B	A087	Buteo buteo			0	0		P					X	
B	A144	Calidris alba			0	1	i	V					X	
B	A145	Calidris minuta			0	100	i	R					X	
B	A366	Carduelis cannabina			0	0		P					X	
B	A364	Carduelis carduelis			0	0		P					X	
B	A363	Carduelis chloris			0	0		P					X	
B	A365	Carduelis spinus			0	0		P					X	
I	1008	Centrostephanu s longispinus						P	X					
B	A335	Certhia brachydactyla			0	0		P					X	
F		Chondros toma prespense						P					X	
R	1283	Coronella austriaca						P	X					
B	A212	Cuculus canorus			0	0		P					X	
B	A253	Delichon urbica			0	0		P					X	
R	6138	Dolichophis caspius						P	X					
B	A377	Emberiza cirlus			0	0		P					X	
B	A381	Emberiza schoeniclus			0	10	p	R					X	
M	1327	Eptesicus serotinus						P	X					
B	A269	Erithacus rubecula			0	0		P					X	
B	A359	Fringilla coelebs			0	0		C					X	

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B	A360	Fringilla montifringilla			0	0		P					X	
B	A123	Gallinula chloropus			0	10	p	P					X	
P		Glyceria maxima						P						X
I		Gyraulus stankovici						P				X		
R	5669	Hierophis gemonensis						V	X					
B	A299	Hippolais icterina			0	0		R					X	
B	A252	Hirundo daurica			0	0		P					X	
B	A251	Hirundo rustica			0	0		P					X	
A	1203	Hyla arborea						P	X					
M	5365	Hypsugo savii						P	X					
R	1251	Lacerta trilineata						P	X					
R	1263	Lacerta viridis						P	X					
B	A340	Lanius excubitor			0	0		R					X	
B	A459	Larus cachinnans			0	1	i	V					X	
B	A182	Larus canus			0	5	i	R					X	
B	A183	Larus fuscus			0	0		V					X	
B	A179	Larus ridibundus			286	521	i	C					X	
B	A150	Limicola falcinellus			0	0		V					X	
B	A156	Limosa limosa			0	100	i	R					X	
B	A271	Luscinia megarhynchos			0	0		P					X	
B	A262	Motacilla alba			0	0		P					X	
B	A261	Motacilla cinerea			0	0		P					X	
B	A260	Motacilla flava			0	0		C					X	
B	A319	Muscicapa striata			0	0		R					X	
R	1292	Natrix tessellata						C	X				X	
B	A160	Numenius arquata			0	1	i	V					X	
M	1331	Nyctalus leisleri							X					
M	1312	Nyctalus noctula							X					

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P		Nymphaea alba						p						X
B	A214	Otus scops			0	0		P					X	
I		Parabythinella macedonica						P				X		
I		Parabythinella malaprespensis						P				X		
B	A329	Parus caeruleus			0	0		P					X	
B	A330	Parus major			0	0		P					X	
A	1200	Pelobates syriacus						P	X					
B	A315	Phylloscopus collybita			0	0		P					X	
B	A316	Phylloscopus trochilus			0	0		P					X	
M		Pipistrellus kuhlii						P	X					
M		Pipistrellus nathusii						P	X					
M	1309	Pipistrellus pipistrellus						P	X					
I		Pisidium maasseni						P				X		
I		Planorbis (Crassiplanorbis) prespensis						P				X		
B	A235	Picus viridis			0	0		P					X	
I		Planorbarius corneus arabatzis						P				X		
B	A141	Pluvialis squatarola			0	0		R					X	
R	1238	Podarcis erhardii						R	X					
R	1256	Podarcis muralis						C	X					
R	1248	Podarcis taurica						R	X					
I		Prespolitorea valvataeformis						P				X		
I		Pyrgohydrobia (Prespopyrgula) prespensis						P				X		
I		Radix pinteri						P				X		
B	A118	Rallus aquaticus			10	0	p	P					X	
B	A317	Regulus regulus			0	0		P					X	
B	A249	Riparia riparia			0	0		C					X	

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B	A249	Riparia riparia			0	0		P					X	
P		Rumex hydrolapathum						P						X
F	5355	Salmo peristericus						P	X			X		
P		Salvinia natans						P						X
F		Squalius prespensis						P				X		
B	A311	Sylvia atricapilla			0	0		P					X	
B	A308	Sylvia curruca			0	0		P					X	
B	A048	Tadorna tadorna			0	17	i	R					X	
P		Trapa natans						V						X
B	A161	Tringa erythropus			0	0		R					X	
B	A164	Tringa nebularia			0	0		R					X	
B	A165	Tringa ochropus			0	0	p	R					X	
B	A163	Tringa stagnatilis			0	0		R					X	
B	A162	Tringa totanus			0	100	i	R					X	
B	A283	Turdus merula			0	0		P					X	
B	A285	Turdus philomelos			0	0		P					X	
B	A287	Turdus viscivorus			0	0		P					X	
B	A232	Upupa epops			0	0		P					X	
M	1332	Vespertilio murinus						P	X					
I		Vinodolia (Prespiana) lacustris						P				X		
R	1295	Vipera ammodytes						R	X				X	

- **Group**: A = Amphibians, B = Birds, F = Fish, Fu = Fungi, I = Invertebrates, L = Lichens, M = Mammals, P = Plants, R = Reptiles
- **CODE**: for Birds, Annex IV and V species the code as provided in the 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 standard list of population units and codes in accordance with Article 12 and 17 reporting, (see reference portal)
- **Cat.**: Abundance categories: C = common, R = rare, V = very rare, P = present
- **Motivation categories**: **IV, V**: Annex Species (Habitats Directive), **A**: National Red List data; **B**: Endemics; **C**: International Conventions; **D**: other reasons

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4. SITE DESCRIPTION

Back to top

4.1 General site character

Habitat class	% Cover
N06	85
N07	2
N09	1
N10	1,8
N16	3
N23	0,2
N27	7
Total Habitat Cover	100

Other Site Characteristics

The site includes the North Macedonian part of Lake Prespa (Macro Prespa) in SW of the Republic of North Macedonia, cliffs on its shoreline and swamps near the villages of Stenje and Nakolec, as well as wet meadows, reedbeds and fishponds between the villages of Sir Han and Asamati. Lake Prespa's coast is polygenetic; the east coast (slopes of Mt Pelister) is of potamogene character as a result of several river inflows from the mountain (Brajinska Reka, Kranska Reka etc.). The northern coast is basically of limnogene character, and along the northern shoreline it is of phytogene origin (owing to its wetland vegetation). On the western coast, the shoreline is of abrasive character, with notable cliffs, as a result of the geological composition represented by Triassic limestone and without rivers. The most important river is the Golema Reka in the north.

The max. depth of the lake reaches 54 m. The lake surface constitutes the greater part of the site, but extensive reedbeds are found along the northern shore (between the villages of Sir Han and Asamati), and along the eastern shoreline (near Stenje and at Nakolec). Remains of riparian forests can also be seen. There are two drained fishponds with recent plans for reactivation. Large sand beach in process of succession is found around the village of Stenje on the northern shore. Wet meadows and Carex fields spread around the village of Perovo. Cliffs are present on the island Golem Grad and between Stenje and Konjsko villages, overgrown by old Greek Juniper *Juniperus excelsa* forests.

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According to the Habitats Directive Annex 1, the following natural habitat types can be found in the Prespa Region: 3150 Natural eutrophic lakes with Magnopotamion or Hydrocharition-type vegetation; 3260 Water courses of plain to montane levels with Ranunculion fluitantis and Callitricho-Batrachion vegetation; 3270 Rivers with muddy banks with Chenopodion rubri p.p. and Bidention p.p. vegetation; 3290 Intermittently flowing Mediterranean rivers of the Paspalo-Agrostidion; 6220* Pseudo-steppe with grasses and annuals of the Thero-Brachypodietea; 6260 * Pannonic sand steppes; 6420 Mediterranean tall humid grassland of Molinio-Holochenion; 6430 Hydrophilous tall herb communities of plains and of the montane to alpine levels; 6510 Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis); 91E0 * Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae); 92A0 + *Salix alba* and *Populus alba* galleries and 7220* Petrifying springs with tufa formation (Cratoneurion).

Bird fauna of Lake Prespa is among the best studied in the country (Micevski 1998). In total, 103 waterbird species have been recorded. Up to300 individuals of Dalmatian Pelican and up to 100 individuals of White Pelican can be seen concurrently on the lake surface. Both pelican species breed at Lake Mikri Prespa in Greece with estimated 1,169 pairs of Dalmatian and 332 pairs of White Pelican in 2010 (Society for Protection of Prespa 2011). They visit Lake Macro Prespa for feeding (when they can be readily seen accompanying fishermen's boats) and roosting, especially along the shoreline between the villages of Konjsko and Stenje.

4.2 Quality and importance

With a surface area of 273 sq. km, Great Prespa Lake is the second largest in Macedonia after Lake Ohrid. It is situated in the deepest part of the Prespa basin on the SW part of the Republic of Macedonia at an altitude of 855m. Great Prespa Lake sits about 150m above Lake Ohrid, which lies only about 10 km to the west. Between the two is Mountain Galichica (National Park), through which with underground stream Lake Prespa supplies Lake Ohrid with water. The biggest island in the Great Prespa Lake, on Macedonia's side, is called Golem Grad ("Large Town"). Today it is uninhabited.The entire lake is protected as a Nature Monument since 1996, its northern shallow parts and shores have been protected as "Ezerani" Natural Park (2,080 ha), whereas the island of Golem Grad is a Strict Nature Reserve and belongs to Galicica National Park. . A separate SDF is prepared for Golem Grad island.

It is important trophic resource for large amount of the Pelicans which breed on the Small Prespa Lake in Greece. It is also a Ramsar Site of international importance, among other criteria due to its importance for waterbirds. The lake an Important Bird Area (IBA MK006) from 2010 (Velevski et al. 2010, Birdlife international 2016) and adjacent to the sites "Lake Megali Prespa" (AL003) in Albania and "Lake Mikri Prespa and Lake Megali Prespa" (GR047) in Greece (Heath and Evans 2000).The site covers criteria A1 (The site regularly holds significant numbers of a globally threatened species, or other species of global conservation concern) for the Dalmatian pelican (*Pelecanus crispus*). It is from European importance for White pelican (*Pelecanus onocrotalus*), Goosander (*Mergus merganser*) and Little Bittern (*Ixobrichus minutus*).

4.3 Threats, pressures and activities with impacts on the site

The most important impacts and activities with high effect on the site

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Negative Impacts			
Rank	Threats and pressures [code]	Pollution (optional) [code]	inside/outside [i|o|b]
M	A04.03		i
M	A06		i
H	A07		b
H	A08		b
M	B02.04		i
M	C01.01		i
M	E03.01		i
L	F02.01.02		i
L	F03.01		i
L	G01		i
H	H01		b
L	H02		b
H	I01		b
H	J01.02		i
H	J02		b

Positive Impacts			
Rank	Activities, management [code]	Pollution (optional) [code]	inside/outside [i|o|b]

Rank: H = high, M = medium, L = low
Pollution: N = Nitrogen input, P = Phosphor/Phosphate input, A = Acid input/acidification, T = toxic inorganic chemicals, O = toxic organic chemicals, X = Mixed pollutions
i = inside, o = outside, b = both

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4.4 Ownership (optional)

4.5 Documentation

5. SITE PROTECTION STATUS (optional)

Back to top

5.1 Designation types at national and regional level:

Code	Cover [%]	Code	Cover [%]	Code	Cover [%]
MK00	100.0				

5.2 Relation of the described site with other sites:

5.3 Site designation (optional)

6. SITE MANAGEMENT

Back to top

6.1 Body(ies) responsible for the site management:

6.2 Management Plan(s):

An actual management plan does exist:

- [ ] Yes
- [ ] No, but in preparation
- [x] No

6.3 Conservation measures (optional)

7. MAP OF THE SITES

Back to top

INSPIRE ID: MK0000003

Map delivered as PDF in electronic format (optional)

- [ ] Yes
- [x] No

Reference(s) to the original map used for the digitalisation of the electronic boundaries (optional).

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ANNEX 2. SDF of Golem Grad Island (potential Natura 2000 site / a part of site).

NATURA 2000 - STANDARD DATA FORM

**For Special Protection Areas (SPA),
Proposed Sites for Community Importance (pSCI),
Sites of Community Importance (SCI)
and for Special Areas of
Conservation (SAC)**

SITE **MK0000003**
SITENAME **Lake Prespa**

TABLE OF CONTENTS

1. SITE IDENTIFICATION

1.1 Type	1.2 Site code	Back to top
A	MK00000XX	

1.3 Site name

Golem Grad Island

1.4 First Compilation date	1.5 Update date 15.07.2019

1.6 Respondent:

Name/Organisation:	Ministry of environment and physical planning
Address:	Bul. Goce Delcev no. 18, Skopje, R. Macedonia
E-mail:	

1.7 Site indication and designation / classification dates

Date site classified as SPA:	0000-00
National legal reference of SPA designation	No data

2. SITE LOCATION

2.1 Site-centre location [decimal degrees]:

Back to top

Lake Prespa – Golem Grad Island Natura 2000 Standard Data Form Page 1 (8)

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Longitude	Latitude
20.9894	40.8699

2.2 Area [ha]: **2.3 Marine area [%]**

20,0 ha

2.4 Sitelength [km]:
0,67 km

2.5 Administrative region code and name

NUTS level 2 code	Region Name
MK00	Macedonia

2.6 Biogeographical Region(s)

Alpine (100%)

3. ECOLOGICAL INFORMATION

Back to top

3.1 Habitat types present on the site and assessment for them

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Annex I Habitat types						Site assessment			
Code	PF	NP	Cover [ha]	Cave [number]	Data quality	A|B|C|D	A|B|C		
						Representativity	Relative Surface	Conservation	Global
9560*			16		G	A	A	B	B
8310				5	G	B	C	B	C
8210			4		G	B	C	B	C

3.2 Species referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive 92/43/EEC and site evaluation for them

Species					Population in the site						Site assessment			
G	Code	Scientific Name	S	NP	T	Size		Unit	Cat.	D.qual.	A|B|C|D	A|B|C		
						Min	Max				Pop.	Con.	Iso.	Glo.
B	A027	Egretta alba			c	0	20	i	P	M	B	B	B	C
B	A026	Egretta garzetta			c	0	10	i	P	M	B	C	C	C
B	A125	Fulica atra			w	0	100	i	P	G	C	B	C	C
B	A338	Lanius collurio			r	0	10	i	P	DD	C	B	C	C
B	A070	Mergus merganser			w	0	5	i	P	G	A	A	A	B
M	1310	Miniopterus schreibersii			p	200	5000	i	C	G	C	A	C	B
M	1316	Myotis cappacinii			p	200	2000	i	C	G	C	A	C	B
R	1292	Natrix tessellata			p	20	500	i	C	M	C	A		C
B	A020	Pelecanus crispus			p	0	200	i	C	G	A	B	A	B
B	A019	Pelecanus onocrotalus			r	0	10	i	P	G	A	B	B	C
B	A393	Phalacrocorax pygmeus			p	0	50	i	C	M	B	B	B	B
B	A005	Podiceps cristatus			w	0	100	i	P	G	A	B	C	C
B	A008	Podiceps nigricollis			w	0	10	i	P	G	A	B	C	B
M	1305	Rhinolophus ferrumequineum			p	0	5	i	P	M	C	C	C	C
B	A193	Sterna hirundo			r	0	5	i	P	M	C	C	C	C

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R	1217	Testudo hermanni			P	50	200	I	C	G	C	B	C	B
R	1295	Vipera ammodytes			p	10	200	i	C	G	C	B	C	B

- **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 Standard list of population units and codes in accordance with Article 12 and 17 reporting (see reference portal)
- **Abundance categories (Cat.)**: C = common, R = rare, V = very rare, P = present - to fill if data 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); VP = 'Very poor' (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 (optional)

Species					Population in the site				Motivation					
Group	CODE	Scientific Name	S	NP	Size		Unit	Cat.	Species Annex		Other categories			
					Min	Max		C|R|V|P	IV	V	A	B	C	D
		Anthrodia juniperina						P						X
		Battarrea phalloides						P						X
I		Bithynia prespensis						P				X		
P		Celtis glabrata						P						X
		Geastrum fornicatum						P						X
I		Gyraulus stankovici						P				X		
R	1251	Lacerta trilineata						P	X					
R	1263	Lacerta viridis						P	X					
M	5365	Hypsugo savii			0	5	i	R	X					
B	A179	Larus ridibundus			0	30	i	P					X	
B	A262	Motacilla alba			0	5	i	P					X	
B	A017	Phalacrocorax carbo			500	3000	i	C					X	
M	1309	Pipistrellus pipistrellus			0	5	i	R	X					

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R	1238	Podarcis erhardii						P	X					
R	1256	Podarcis muralis						P	X					
R	1248	Podarcis taurica						P	X					
B	A210	Streptopelia turtur			0	5	i	P						X

- **Group**: A = Amphibians, B = Birds, F = Fish, Fu = Fungi, I = Invertebrates, L = Lichens, M = Mammals, P = Plants, R = Reptiles
- **CODE**: for Birds, Annex IV and V species the code as provided in the 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 standard list of population units and codes in accordance with Article 12 and 17 reporting, (see reference portal)
- **Cat.**: Abundance categories: C = common, R = rare, V = very rare, P = present
- **Motivation categories**: **IV, V**: Annex Species (Habitats Directive), **A**: National Red List data; **B**: Endemics; **C**: International Conventions; **D**: other reasons

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4. SITE DESCRIPTION

Back to top

4.1 General site character

Habitat class	% Cover
N17	80
N22	20
Total Habitat Cover	100

Other Site Characteristics

Golem Grad island is the only island in the Republic of North Macedonia and it has great importance for biodiversity, history and archaeology. Bedrock of this rocky island consists mainly on Triassic limestones. Island is in large parts covered by very old Greek Juniper *Juniperus excelsa* forest with very high conservation value.

Habitat type belongs to priority habitat Habitat directive 9560 * Endemic forests with Juniperus spp. This type of thermophilic Pruno webii-Juniperetum excelsae vegetation association is rare in the whole North Macedonia. *Celtis glabrata* tree is a typical species in Pruno webii-Juniperetum excelasae and in North Macedonia it grows only in Golem Grad.

Calcareous shoreline cliffs of height 5-10 m are almost surrounding Golem Grad and make it to look like fortification when seen from the lake. There are also a couple of caves in these shoreline cliffs including Bimbilova Cave. These caves are important for bats and large colonies of *Myotis capaccinii* and *Miniopterus schreibersii* are met in Bimbilova cave. Also following bat species have been observed from the island: *Rhinolophus ferrumequinum*, *Pipistrellus pipistrellus* and *Hypsugo savii*,

Golem Grad Island holds dense populations of birds and reptiles with high conservation value, the latter having been the subject of intense population studies in the past decade. The ecological and evolutionary insight provided from the three studied populations of Annex II species of reptiles and amphibians (*Testudo hermanni*, *Vipera ammodytes* and *Natrix tessellata*) attests to the huge scientific and conservation importance of Golem Grad and by extension - Prespa Lake."

Several water birds use shoreline rocks and boulders of Golem Grad for resting and fishing. These include Dalmatian pelecan (*Pelecanus crispus),* White Pelican (*Pelecanus onocrotalus*), Pygmy Cormorant (*Phalacrocorax pygmeus*) and Great White Egret (*Egretta alba*). All these species belong to Annex I of the Bird Directive. There is also a big population of the Great cormorant (*Phalacrocorax carbo*) nesting in juniper trees of the island and fishing in nearby waters. It is the most numerous breeding bird species is the Prespa Lake withh nearly 3,000 pairs at Golem Grad island

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4.2 Quality and importance

The biggest island in the Great Prespa Lake, on Macedonia's side, is called Golem Grad ("Large Town"). Today it is uninhabited, but actively visited by tourists. In addition to high biodiversity values there are a lot of archeological values.

The island of Golem Grad is a Strict Nature Reserve and it belongs to Galicica National Park. It is surrounded by Prespa Lake National Monument protected area. The lake Prespa is part of Important Bird Area (IBA MK006).

Bimbilova Cave on Golem Grad Island is identified to be among three of the most important caves for bats in Prespa basin. It host large populations of Annex II and IV species Myotis cappacinii and Micropterus scheibersii throught the year (at least a couple of thousands).

4.3 Threats, pressures and activities with impacts on the site

The most important impacts and activities with high effect on the site

Negative Impacts			
Rank	Threats and pressures [code]	Pollution (optional) [code]	inside/outside [i|o|b]
L	D03.01.02		i
M	F02		b
M	F03.02.01		i
H	G01		b
M	G02.09		b
L/M	I02		i

Positive Impacts			
Rank	Activities, management [code]	Pollution (optional) [code]	inside/outside [i|o|b]

Rank: H = high, M = medium, L = low
Pollution: N = Nitrogen input, P = Phosphor/Phosphate input, A = Acid input/acidification, T = toxic inorganic chemicals, O = toxic organic chemicals, X = Mixed pollutions
i = inside, o = outside, b = both

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4.4 Ownership (optional)

4.5 Documentation

5. SITE PROTECTION STATUS (optional)

Back to top

5.1 Designation types at national and regional level:

Code	Cover [%]	Code	Cover [%]	Code	Cover [%]
MK00	100.0				

5.2 Relation of the described site with other sites:

5.3 Site designation (optional)

6. SITE MANAGEMENT

Back to top

6.1 Body(ies) responsible for the site management:

6.2 Management Plan(s):
An actual management plan does exist:

- [ ] Yes
- [ ] No, but in preparation
- [X] No

6.3 Conservation measures (optional)

7. MAP OF THE SITES

Back to top

INSPIRE ID: MK00000XX

Map delivered as PDF in electronic format (optional)

- [ ] Yes
- [X] No

Reference(s) to the original map used for the digitalisation of the electronic boundaries (optional).

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ANNEX 3. The results of METT analysis for Prespa Lake NM

QUESTION		Score	Comment/Explanation	Next Steps
1. Legal status: Does the protected area have legal status (or in the case of private reserves is covered by a covenant or similar)?, Context		**3**		
Points	**Description**			
0	The protected area is not gazetted/covenanted			
1	There is agreement that the protected area should be gazetted/covenanted but the process has not yet begun			
2	The protected area is in the process of being gazetted/covenanted but the process is still incomplete (includes sites designated under international conventions, such as Ramsar, or local/traditional law such as community conserved areas, which do not yet have national legal status or covenant)			
3	The protected area has been formally gazetted/covenanted			
2. Protected area regulations: Are appropriate regulations in place to control land use and activities (e.g. hunting)?, Planning		**2**		By capacity building and taking formally charge of the management (implementation of the MP) the situation will be improved
Points	**Description**			Negative impacts come outside of the PA, the municipality cannot control all; more education for the local citizens
0	There are no regulations for controlling land use and activities in the protected area			
1	Some regulations for controlling land use and activities in the protected area exist but these are major weaknesses			
2	Regulations for controlling land use and activities in the protected area exist but there are some weaknesses or gaps		Low lelev of awareness, staffing and organisation in the service for legal and property rights	
3	Regulations for controlling inappropriate land use and activities in the protected area exist and provide an excellent basis for management			
3. Law enforcement: Can staff (i.e. those with responsibility for managing the site)enforce protected area rules well enough?, Inputs		**1**	Lack of funds and staff to manage the waters of PL; the currect staff does not have the capacity to cover the whole territory of the area	To strengthen the capacity of the service
Points	**Description**			
0	The staff have no effective capacity/resources to enforce protected area legislation and regulations			
1	There are major deficiencies in staff capacity/resources to enforce protected area legislation and regulations (e.g. lack of skills, no patrol budget, lack of institutional support)			
2	The staff have acceptable capacity/resources to enforce protected area legislation and regulations but some deficiencies remain			
3	The staff have excellent capacity/resources to enforce protected area legislation and regulations			
4. Protected area objectives: Is management undertaken according to agreed objectives?, Planning		**2**	Because the plan is in its adoption phase, it has been prepared with defined objectives, but because the implementation has not yet begun we have assessed this with score 2	Proper implementation of the management plan
Points	**Description**			
0	No firm objectives have been agreed for the protected area			
1	The protected area has agreed objectives, but is not managed according to these objectives			
2	The protected area has agreed objectives, but is only partially managed according to these objectives			
3	The protected area has agreed objectives and is managed to meet these objectives			
5. Protected area design: Is the protected area the right size and shape to protect species, habitats, ecological processes and water catchments of key conservation concern?, Planning		**2**	Competence over Golem Grad	To potentially make a revision of the borders of NP Galichica as to reallocate Golem Grad under the competence of the Municipality of Resen
Points	**Description**			
0	Inadequacies in protected area design mean achieving the major objectives of the protected area is very difficult			
1	Inadequacies in protected area design mean that achievement of major objectives is difficult but some mitigating actions are being taken (e.g. agreements with adjacent land owners for wildlife corridors or introduction of appropriate catchment management)			
2	Protected area design is not significantly constraining achievement of objectives, but could be improved (e.g. with respect to larger scale ecological processes)			
3	Protected area design helps achievement of objectives; it is appropriate for species and habitat conservation; and maintains ecological processes such as surface and groundwater flows at a catchment scale, natural disturbance patterns etc.			

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6. Protected area boundary demarcation: Is the boundary known and demarcated., Process		**1**		
Points	**Description**			
0	The boundary of the protected area is not known by the management authority or local residents/neighbouring land users			
1	The boundary of the protected area is known by the management authority but is not known by local residents/neighbouring land users			
2	The boundary of the protected area is known by both the management authority and local residents/neighbouring land users but is not appropriately demarcated			
3	The boundary of the protected area is known by the management authority and local residents/neighbouring land users and is appropriately demarcated			
7. Management plan: Is there a management plan and is it being implemented?, Planning		**1**	The MP is in the process of revision according the EU legislation; the plan is in its adoption phase and it is expected to be adopted and to enter in force by August	
Points	**Description**			
0	There is no management plan for the protected area			
1	A management plan is being prepared or has been prepared but is not being implemented			
2	A management plan exists but it is only being partially implemented because of funding constraints or other problems			
3	A management plan exists and is being implemented			
7a. Planning process (Additional Points, Planning)		**1**		
Points	**Description**			
1	The planning process allows adequate opportunity for key stakeholders to influence the management plan			
7b. Planning process (Additional Points, Planning)		**1**		
Points	**Description**			
1	There is an established schedule and process for periodic review and updating of the management plan			
7c. Planning process (Additional Points, Planning)		**1**		
Points	**Description**			
1	The results of monitoring, research and evaluation are routinely incorporated into planning			
8. Regular work plan: Is there a regular work plan and is it being implemented, Planning/Outputs		**0**	With the adoption of the management plan such working plans will be regularly adopted	
Points	**Description**			
0	No regular work plan exists			
1	A regular work plan exists but few of the activities are implemented			
2	A regular work plan exists and many activities are implemented			
3	A regular work plan exists and all activities are implemented			
9. Resource inventory: Do you have enough information to manage the area?, Inputs		**2**	the research needs to be continuous	
Points	**Description**			
0	There is little or no information available on the critical habitats, species and cultural values of the protected area			
1	Information on the critical habitats, species, ecological processes and cultural values of the protected area is not sufficient to support planning and decision making			
2	Information on the critical habitats, species, ecological processes and cultural values of the protected area is sufficient for most key areas of planning and decision making			
3	Information on the critical habitats, species, ecological processes and cultural values of the protected area is sufficient to support all areas of planning and decision making			
10. Protection systems: Are systems in place to control access/resource use in the protected area?, Process/Outcome		**0**		Strengthened renger's service; increasing the capacities
Points	**Description**			
0	Protection systems (patrols, permits etc) do not exist or are not effective in controlling access/resource use			
1	Protection systems are only partially effective in controlling access/resource use			
2	Protection systems are moderately effective in controlling access/resource use			
3	Protection systems are largely or wholly effective in controlling access/ resource use			
11. Research: Is there a programme of management oriented survey and research work?, Process		**1**	between 1 and 2	
Points	**Description**			
0	There is no survey or research work taking place in the protected area			
1	There is a small amount of survey and research work but it is not directed towards the needs of protected area management			
2	There is considerable survey and research work but it is not directed towards the needs of protected area management			
3	There is a comprehensive, integrated programme of survey and research work, which is relevant to management needs			

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12. Resource management: Is active resource management being undertaken?, Process		**1**		
Points	**Description**			
0	Active resource management is not being undertaken			
1	Very few of the requirements for active management of critical habitats, species, ecological processes and cultural values are being implemented			
2	Many of the requirements for active management of critical habitats, species, ecological processes and, cultural values are being implemented but some key issues are not being addressed			
3	Requirements for active management of critical habitats, species, ecological processes and, cultural values are being substantially or fully implemented			
13. Staff numbers: Are there enough people employed to manage the protected area?, Inputs		**1**		
Points	**Description**			
0	There are no staff			
1	Staff numbers are inadequate for critical management activities			
2	Staff numbers are below optimum level for critical management activities			
3	Staff numbers are adequate for the management needs of the protected area			
14. Staff training: Are staff adequately trained to fulfil management objectives?, Inputs/Process		**1**	Additional training for the employees is needed, as well as employees with different backgrounds (biologists, environmentalists)	
Points	**Description**			
0	Staff lack the skills needed for protected area management			
1	Staff training and skills are low relative to the needs of the protected area			
2	Staff training and skills are adequate, but could be further improved to fully achieve the objectives of management			
3	Staff training and skills are aligned with the management needs of the protected area			
15. Current budget: Is the current budget sufficient?, Inputs		**1**	Since the law has not yet entered in force, the municipality has not yet clearly envisaged any budget for the MN PL as it has for the PN Ezerani	
Points	**Description**			
0	There is no budget for management of the protected area			
1	The available budget is inadequate for basic management needs and presents a serious constraint to the capacity to manage			
2	The available budget is acceptable but could be further improved to fully achieve effective management			
3	The available budget is sufficient and meets the full management needs of the protected area			
16. Security of budget: Is the budget secure?, Inputs		**1**	The municipality has the capacity to regularly prepare the budget for its competences over the area once the plan enters in force	
Points	**Description**			
0	There is no secure budget for the protected area and management is wholly reliant on outside or highly variable funding			
1	There is very little secure budget and the protected area could not function adequately without outside funding			
2	There is a reasonably secure core budget for regular operation of the protected area but many innovations and initiatives are reliant on outside funding			
3	There is a secure budget for the protected area and its management needs			
17. Management of budget: Is the budget managed to meet critical management needs?, Process		**2**	to reformulate the question	
Points	**Description**			
0	Budget management is very poor and significantly undermines effectiveness (e.g. late release of budget in financial year)			
1	Budget management is poor and constrains effectiveness			
2	Budget management is adequate but could be improved			
3	Budget management is excellent and meets management needs			
18. Equipment: Is equipment sufficient for management needs?, Inputs		**2**		GIS, active management, management machinery for the reed, edu centre, boats
Points	**Description**			
0	There are little or no equipment and facilities for management needs			
1	There are some equipment and facilities but these are inadequate for most management needs			
2	There are equipment and facilities, but still some gaps that constrain management			
3	There are adequate equipment and facilities			
19. Maintenance of equipment: Is equipment adequately maintained?, Process		**3**		
Points	**Description**			
0	There are little or no maintenance of equipment and facilities			
1	There is some ad hoc maintenance of equipment and facilities			
2	There is basic maintenance of equipment and facilities			
3	Equipment and facilities are well maintained			

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20. Education and awareness: Is there a planned education programme linked to the objectives and needs?, Process		**0**		
Points	**Description**			
0	There is no education and awareness programme			
1	There is a limited and ad hoc education and awareness programme			
2	There is an education and awareness programme but it only partly meets needs and could be improved			
3	There is an appropriate and fully implemented education and awareness programme			
21. Planning for land and water use: Does land and water use planning recognise the protected area and aid the achievement of objectives?, Planning		**0**	new orchards, use of underground water, waste and waste water; current activities, eg. in the agriculture (water extraction, use of artificial fertilisers) is adversely affecting on the needs of the area	
Points	**Description**			
0	Adjacent land and water use planning does not take into account the needs of the protected area and activities/policies are detrimental to the survival of the area			
1	Adjacent land and water use planning does not takes into account the long term needs of the protected area, but activities are not detrimental the area			
2	Adjacent land and water use planning partially takes into account the long term needs of the protected area			
3	Adjacent land and water use planning fully takes into account the long term needs of the protected area			
21a: Land and water planning for habitat conservation (Additional Points, Planning)		**0**	There is a management plan for the basin of the PL, but the implementation is not complete	
Points	**Description**			
1	Planning and management in the catchment or landscape containing the protected area incorporates provision for adequate environmental conditions (e.g. volume, quality and timing of water flow, air pollution levels etc) to sustain relevant habitats.			
21b: Land and water planning for connectivity (Additional Points, Planning)		**0**		
Points	**Description**			
1	Management of corridors linking the protected area provides for wildlife passage to key habitats outside the protected area (e.g. to allow migratory fish to travel between freshwater spawning sites and the sea, or to allow animal migration)			
21c: Land and water planning for ecosystem services & species conservation (Additional Points, Planning)		**0**		
Points	**Description**			
1	Planning adresses ecosystem-specific needs and/or the needs of particular species of concern at an ecosystem scale (e.g. volume, quality and timing of freshwater flow to sustain particular species, fire management to maintain savannah habitats etc.)			
22. State and commercial neighbours: Is there co-operation with adjacent land and water users?, Process		**1**		
Points	**Description**			
0	There is no contact between managers and neighbouring official or corporate land and water users			
1	There is contact between managers and neighbouring official or corporate land and water users but little or no cooperation			
2	There is contact between managers and neighbouring official or corporate land and water users, but only some co-operation			
3	There is regular contact between managers and neighbouring official or corporate land and water users, and substantial co-operation on management			
23. Indigenous people: Do indigenous and traditional peoples resident or regularly using the protected area have input to management decisions?, Process				
Points	**Description**			
0	Indigenous and traditional peoples have no input into decisions relating to the management of the protected area			
1	Indigenous and traditional peoples have some input into discussions relating to management but no direct role in management			
2	Indigenous and traditional peoples directly contribute to some relevant decisions relating to management but their involvement could be improved			
3	Indigenous and traditional peoples directly participate in all relevant decisions relating to management, e.g. co-management			
24. Local communities: Do local communities resident or near the protected area have input to management decisions?, Process		**2**		
Points	**Description**			
0	Local communities have no input into decisions relating to the management of the protected area			
1	Local communities have some input into discussions relating to management but no direct role in management			
2	Local communities directly contribute to some relevant decisions relating to management but their involvement could be improved			
3	Local communities directly participate in all relevant decisions relating to management, eg. co-management			

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24a. Impact on communities (Additional points Local communities/indigenous people)		**1**	there is not enough trust	
Points	**Description**			
1	There is open communication and trust between local and/or indigenous people, stakeholders and protected area managers			
24b. Impact on communities (Additional points Local communities/indigenous people)		**1**		
Points	**Description**			
1	Programmes to enhance community welfare, while conserving protected area resources, are being implemented			
24c. Impact on communities (Additional points Local communities/indigenous people)		**1**		
Points	**Description**			
1	Local and/or indigenous people actively support the protected area			
25. Economic benefit: Is the protected area providing economic benefits to local communities, e.g. income, employment, payment for environmental services?, Outcomes		**2**		
Points	**Description**			
0	The protected area does not deliver any economic benefits to local communities			
1	Potential economic benefits are recognised and plans to realise these are being developed			
2	There is some flow of economic benefits to local communities			
3	There is a major flow of economic benefits to local communities from activities associated with the protected area			
26. Monitoring and evaluation: Are management activities monitored against performance?, Planning/Process		**1**	Unlike the continuous monitoring on the water quality, the biodiversity components are not subject to such regular monitoring	
Points	**Description**			
0	There is no monitoring and evaluation in the protected area			
1	There is some ad hoc monitoring and evaluation, but no overall strategy and/or no regular collection of results			
2	There is an agreed and implemented monitoring and evaluation system but results do not feed back into management			
3	A good monitoring and evaluation system exists, is well implemented and used in adaptive management			
27. Visitor facilities: Are visitor facilities adequate?, Outputs		**1**	The assessment refers to the fact that there is no infrastructure for evaluation of natural values, with respect to the management objectives	
Points	**Description**			
0	There are no visitor facilities and services despite an identified need			
1	Visitor facilities and services are inappropriate for current levels of visitation			
2	Visitor facilities and services are adequate for current levels of visitation but could be improved			
3	Visitor facilities and services are excellent for current levels of visitation			
28. Commercial tourism operators: Do commercial tour operators contribute to protected area management?, Process		**0**		
Points	**Description**			
0	There is little or no contact between managers and tourism operators using the protected area			
1	There is contact between managers and tourism operators but this is largely confined to administrative or regulatory matters			
2	There is limited co-operation between managers and tourism operators to enhance visitor experiences and maintain protected area values			
3	There is good co-operation between managers and tourism operators to enhance visitor experiences, and maintain protected area values			
29. Fees: If fees (i.e. entry fees or fines) are applied, do they help protected area management?, Inputs/Process		**1**	There is an environmental fee, boat registration fee and other charges collected as an income for the state budget, but there is not any budget delegation for the local budget	
Points	**Description**			
0	Although fees are theoretically applied, they are not collected			
1	Fees are collected, but make no contribution to the protected area or its environs			
2	Fees are collected, and make some contribution to the protected area and its environs			
3	Fees are collected and make a substantial contribution to the protected area and its environs			

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30. Condition of values: What is the condition of the important values of the protected area as compared to when it was first designated?, Outcomes		**2**		
Points	**Description**			
0	Many important biodiversity, ecological or cultural values are being severely degraded			
1	Some biodiversity, ecological or cultural values are being severely degraded			
2	Some biodiversity, ecological and cultural values are being partially degraded but the most important values have not been significantly impacted			
3	Biodiversity, ecological and cultural values are predominantly intact			
30a: Condition of values (Additional Points: Condition of values)		**1**	comprehensive monitoring is needed	
Points	**Description**			
1	The assessment of the condition of values is based on research and/or monitoring			
30b: Condition of values (Additional Points: Condition of values)		**0**		
Points	**Description**			
1	Specific management programmes are being implemented to address threats to biodiversity, ecological and cultural values			
30c: Condition of values (Additional Points: Condition of values)		**0**		
Points	**Description**			
1	Activities to maintain key biodiversity, ecological and cultural values are a routine part of park management			
	TOTAL SCORE	**44**		

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ANNEX 4: List of literature

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