

# Information Sheet on Ramsar Wetlands (RIS) – 2009-2012 version

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Designation date

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Site Reference Number

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**2. Date this sheet was completed/updated:**

26 April 2011

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**3. Country:**

Armenia

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**4. Name of the Ramsar site:**

The precise name of the designated site in one of the three official languages (English, French or Spanish) of the Convention. Alternative names, including in local language(s), should be given in parentheses after the precise name.

Lake Sevan

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**5. Designation of new Ramsar site or update of existing site:**

**This RIS is for** (tick one box only):

- a) Designation of a new Ramsar site ; or  
b) Updated information on an existing Ramsar site

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**6. For RIS updates only, changes to the site since its designation or earlier update:****a) Site boundary and area**

The Ramsar site boundary and site area are unchanged:

or

**If the site boundary has changed:**

- i) the boundary has been delineated more accurately ; or  
ii) the boundary has been extended ; or  
iii) the boundary has been restricted\*\*

and/or

**If the site area has changed:**

- i) the area has been measured more accurately ; or  
ii) the area has been extended ; or  
iii) the area has been reduced\*\*

\*\* **Important note:** If the boundary and/or area of the designated site is being restricted/reduced, the Contracting Party should have followed the procedures established by the Conference of the Parties in the Annex to COP9 Resolution IX.6 and provided a report in line with paragraph 28 of that Annex, prior to the submission of an updated RIS.

**b) Describe briefly any major changes to the ecological character of the Ramsar site, including in the application of the Criteria, since the previous RIS for the site:**

After last RIS update in 1998 the water level of the lake has been increased on 3 m, from 1897 to 1900 m above sea level.

In spite of continuous removing, large forested areas are waterlogged and submerged wood increases organic pollution of water.

The fish stocks are diminished for dozens times and currently further commercial fishery (except for Crucian Carp and Crayfish) is questionable.

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## 7. Map of site:

Refer to Annex III of the *Explanatory Note and Guidelines*, for detailed guidance on provision of suitable maps, including digital maps.

### a) A map of the site, with clearly delineated boundaries, is included as:

- i) a **hard copy** (required for inclusion of site in the Ramsar List): ;
- ii) an **electronic format** (e.g. a ~~JPEG~~ or ~~ArcView~~ image) ;
- iii) a **GIS file providing geo-referenced site boundary vectors and attribute tables** .

### b) Describe briefly the type of boundary delineation applied:

e.g. the boundary is the same as an existing protected area (nature reserve, national park, etc.), or follows a catchment boundary, or follows a geopolitical boundary such as a local government jurisdiction, follows physical boundaries such as roads, follows the shoreline of a waterbody, etc.

The territory of Lake Sevan Ramsar site coincides with the watershed of Lake Sevan and external protective (buffer) zone of “Sevan” National Park (NP). The territory of Lake Sevan Ramsar site occupies 91.5% of the total territory of Gegharquniq Marz (Province).

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## 8. Geographical coordinates (latitude/longitude, in degrees and minutes):

Provide the coordinates of the approximate centre of the site and/or the limits of the site. If the site is composed of more than one separate area, provide coordinates for each of these areas.

Approximate centre is: 40°24'N - 045°17'E.

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## 9. General location:

Include in which part of the country and which large administrative region(s) the site lies and the location of the nearest large town.

Lake Sevan Ramsar site is situated in the central - north-eastern part of Armenia in Gegharquniq Marz (province).

The site is 51 km (60 km by highway) far from the capital city Yerevan. The provincial capital Gavar is located inside the Ramsar site 8 km (11 km by road) far from Lake Sevan.

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## 10. Elevation: (in metres: average and/or maximum & minimum)

Minimum 1899.72 m a. s. l. (water level of Lake Sevan as of 1 January 2011)

Maximum 3597 m a. s. l. (Azhdahak summit on Geghama ridge; 40°13'N - 044°57'E)

## 11. Area: (in hectares)

Total 490,231 ha, of which:

1/ Water (Lake Sevan, rivers, marshes) – 127,320 ha

2/ Land – 362,911 ha

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## 12. General overview of the site:

Provide a short paragraph giving a summary description of the principal ecological characteristics and importance of the wetland.

Lake Sevan Ramsar site represents a complete hydrological system: the lake with its watershed, tributaries and outflow. Lake Sevan is one of the largest freshwater high mountain lakes of Eurasia. The lake is of crucial importance for the country as a source for drinking and irrigation water, cheap electricity and fish, recreation and tourism development. Lake Sevan and its basin are famous by unique diversity of plants, endemic ichthyofauna, as an important resting and wintering area for waterfowl.

Armenia's priority environmental issue is the restoration of the ecological balance of Lake Sevan, the water and biological resources of which are of a vital importance for the socio-economical growth of the country.

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**13. Ramsar Criteria:**

Tick the box under each Criterion applied to the designation of the Ramsar site. See Annex II of the *Explanatory Notes and Guidelines* for the Criteria and guidelines for their application (adopted by Resolution VII.11). All Criteria which apply should be ticked.

1	•	2	•	3	•	4	•	5	•	6	•	7	•	8	•	9
X		X		X		X		<input type="checkbox"/>		X		X		<input type="checkbox"/>		<input type="checkbox"/>

**14. Justification for the application of each Criterion listed in 13 above:**

Provide justification for each Criterion in turn, clearly identifying to which Criterion the justification applies (see Annex II for guidance on acceptable forms of justification).

**Criterion 1:** Lake Sevan is the largest freshwater lake in the Caucasus region and the largest high mountain lake of Europe and Middle East.

**Criterion 2:** The lake and its basin support 48% of rare, vulnerable and endangered fauna and 12% of threatened species of flora of Armenia (48 species) (Red Book of Armenia. The Animals, 2010); of them globally threatened (IUCN Red List) Dalmatian Pelican (VU), White-headed Duck (EN), Lesser White-fronted Goose (VU), Sociable Lapwing (CR).

**Criterion 3:** In the basin of the lake about 1600 species of vascular plants has been registered, i. e. 50% of Armenian flora. The fauna of registered vertebrates consists of 6 species of fishes, 4 species of amphibians, 18 species of reptiles, 235 species of birds, 39 species of mammals.

**Criterion 4:** Lake Sevan is the most important passage and in several years wintering area for migratory waterfowl between Black Sea and Caspian Lake. About 20 species of bird breed here. For Details see point 22.

**Criterion 6:** The area regularly supports around 16% (up to 20%) of the global population of Armenian Gull (*Larus armenicus*). According to the data provided by the Armenian Society for the Protection of Birds, in 2008-2011 the number of breeding pairs in the site was in average 4000, with maximum ca. 5,000.

**Criterion 7:** Lake Sevan supports 2 endemic species (Sevan Trout and Sevan Barbel) and 1 subspecies (Sevan Khramfish).

**15. Biogeography** (required when Criteria 1 and/or 3 and /or certain applications of Criterion 2 are applied to the designation):

Name the relevant biogeographic region that includes the Ramsar site, and identify the biogeographic regionalisation system that has been applied.

**a) biogeographic region:**

Caucasus Ecoregion

**b) biogeographic regionalisation scheme** (include reference citation):

WWF/CEPF

Williams, L., N. Zazanashvili, G. Sanadiradze, A. Kandaurov (Ed.), 2006. An Ecoregional Conservation Plan for the Caucasus, Tbilisi: 222pp.

**16. Physical features of the site:**

Describe, as appropriate, the geology, geomorphology; origins - natural or artificial; hydrology; soil type; water quality; water depth, water permanence; fluctuations in water level; tidal variations; downstream area; general climate, etc.

**Geology and Geomorphology**

The site is young in geological scale and is of high seismic activity.

The bedrocks are formed from tufa (volcanic stone), clinker, porphyrite and limestone.

Mountain ridges up to 3597 m height surround Lake Sevan. On the northern part the watershed is close to the lake (2-3 km), the slopes are steep. On other parts the watershed is up to 30-40 km away and slopes more gently towards the lake.

While it remained undisturbed, the lake located 1916.2 m a. s. l., had 99 m maximum depth, 1416 km<sup>2</sup> surface area and 58.5 km<sup>3</sup> total volume.

To 2001 the water-level has dropped on 19.88 m, the lake surface has shrunk to 1236 km<sup>2</sup> and the volume to 33.1 km<sup>3</sup>. 2001 was the year of the minimum level mark.

As of 1<sup>st</sup> January 2011 the water-level has increased on 3.45 m, the lake surface was 1271 km<sup>2</sup> and the volume was 33.9 km<sup>3</sup>.

Underwater ridge stretched between Ardanish and Noratus capes and divides the lake into two morphologically different parts. The lake consists of the deeper Minor Sevan (average depth 42 m, surface 333 km<sup>2</sup>, volume 13.0 km<sup>3</sup>) and the comparatively shallow Major Sevan (average depth 27 m, surface 938 km<sup>2</sup>, volume 20.9 km<sup>3</sup>).

The relief of the former littoral zone of Lake Sevan (from the current surface of the lake until 1916 m a. s. l.) is mainly wavy or flat. The shores mainly have a moderate decline, in some places steep, with 3-8 meters height.

### Origin.

The lake is of tectonic origin. The age of Major Sevan estimates ca. 1,000,000 years, while the age of Major Sevan less than 100,000 years.

### Hydrology

Lake Sevan Ramsar site represents a complete hydrological system: the lake with its watershed, tributaries and outflow.

The ratio between the lake surface (1271 km<sup>2</sup>) and watershed (3620 km<sup>2</sup>) is ca. 1/3, which is 2-2.5 times less than for most major lakes. 28 rivers feed Lake Sevan, of which 4 flow into Minor Sevan, and 24 into Major Sevan. Total sum of surfaces of the river basins (catchment area) comprises 2930 km<sup>2</sup> (81% of the total area of the lake's watershed), the area of inter-basins covers some 696 km<sup>2</sup> (19% of the total area of the lake watershed).

Five rivers are originated from the Geghama mountain range. Of which River Gavaraget flows to Minor Sevan, and the other rivers to Major Sevan. The total flow from the Geghama mountain range comprises 27.7% of the total river flow to Lake Sevan.

Nine rivers are originated from the Vardenis mountain range and flow to Major Sevan. The total flow from the Vardenis mountain range comprises 61.9% of the total river flow to Lake Sevan.

Eleven rivers are originated from the Sevan mountain range and flow to Major Sevan. The total flow of the rivers of the Sevan mountain range comprising 4.6 % of the total river flow to Lake Sevan.

Two rivers originate from the Areguni mountain range and only one flows from the Pambak mountain range, which flows to Small Sevan. The total flow of the rivers from the Areguni-Pambak mountain range comprises 5.8 % of the total river flow to Lake Sevan.

The average flow of the rivers is 26.8 m<sup>3</sup> sec<sup>-1</sup> (without Arpa-Sevan channel). The affluent season of the year for major rivers is April and June due to spring pouring. Water starts to abound on the first or the second ten days of April and mainly end up during the second half of June. Most of the rivers have very-well expressed two dry seasons: summer-autumn and winter.

The only outlet of Lake Sevan is the river Hrazdan, the natural course of which used to be 110 million m<sup>3</sup> before drop of the Lake level. Currently this river has become a net of channels and water-pipes, through which water withdrawn from Lake Sevan is taken for irrigation purposes.

The hydrological balances for different periods of water management strategy are given in the **Table 1**.

Components of Balance	1927-1933	1949-1962	1970-1979	1984-1990	1992-1997	2002-2009
Surface Inflow	770	669	774	776	892	735

The transfer from River Arpa	0	0	0	214	252	219
Precipitations	550	475	479	486	466	593
Underground Inflow	0	48	56	81	65	94
<b>Summary income</b>	<b>1320</b>	<b>1192</b>	<b>1309</b>	<b>1557</b>	<b>1675</b>	<b>1641</b>
Surface Outflow	50	1383	430	329	831	158
Evaporation	1210	1041	1039	1102	1081	1045
Underground Outflow	60	26	9	9	15	14
<b>Summary outcome</b>	<b>1320</b>	<b>2450</b>	<b>1478</b>	<b>1440</b>	<b>1927</b>	<b>1217</b>
<b>Discrepancy</b>	<b>0</b>	<b>-1258</b>	<b>-169</b>	<b>+117</b>	<b>-252</b>	<b>+424</b>

Under the natural conditions the lake was covered by ice every 15-20 years. The ice-cover has occurred almost every year during the 1970-1980's. Usually the ice-cover period is from the end of January to the beginning of April. However, the lake was fully covered by ice for the last time in 2002. The water temperature in July-August is over 18°C and up to 22-24°C in shallow parts.

### Soils

The natural soil is "chernozem" (black loam). In some parts the soil contains sand, clay or peat. Mountainous-steppe dry "chernozem" soils cover the relict juniper-oak woodlands of Sevan national park, eastern side of Sevan peninsula, the central and eastern rocky and hilly areas of Ardanish peninsula, and mountainous-and-meadows "chernozem" soil cover the areas above 2400 m.

The land area released from waters of Lake Sevan covers the major part of Sevan national park territory. They are sandy, light soils, with too little humus composition. The main developed soil types are: humid-meadow-sandy, ill-developed sand-and-clay and saprolite steppe soils. Ill-developed sand-and-clay soils cover a considerable area. Soil formation is in progress on the former lake bed.

River-valley-slope soils have been formed in the river valleys and their steep slopes.

### Climate

The main factors of climate formation of Lake Sevan are solar radiation and atmospheric circulation.

The number of solar hours per year varies between 2600 and 2800.

Mean temperatures range from -6°C in January to +16 °C in July with average annual temperature fluctuating between +5 and 6°C. The maximum temperature is observed in July-August (+29 °C) and the minimum one in January-February (-36°C on the most western side of the lake watershed and -25 °C on the north-eastern side of the lake).

The number of days in the mountains above 0°C is only 200, compared to 240-260 at lake level.

Atmospheric precipitations of Lake Sevan basin are dependent on the elevation and increase from 400 mm (in the littoral zone of the lake) to 900 mm (within the tops of surrounding mountains). On the shoreline of the lake annual precipitation ranges from 340 to 720 mm: of which 17% falls in the winter, 37% in the spring, 26% in the summer and 20% in the autumn.

The humidity varies on daily and seasonal basis. The average humidity is in winter 70-85% and in summer 65-75%.

The weather is usually windy, average speed of the wind is more than 4 m sec<sup>-1</sup>. Winds are stronger in winter (6 m sec<sup>-1</sup>) and calmer in spring and autumn (3 m sec<sup>-1</sup>).

The snow blanket on the basin of Lake Sevan is formulated in mid November and the sustainable blanket at the beginning of December. Snowmelt starts at the beginning of March and continues till the end of April.

### 17. Physical features of the catchment area:

Describe the surface area, general geology and geomorphological features, general soil types, and climate (including climate type).

Physical features of the catchment area coincide with described for the Ramsar site (see paragraph 16).

### 18. Hydrological values:

Describe the functions and values of the wetland in groundwater recharge, flood control, sediment trapping, shoreline stabilization, etc.

Lake Sevan is of great importance for groundwater recharge. During 2002-2009 the groundwater inflow was equal to 94.2 million m<sup>3</sup> while outflow 14.4 million m<sup>3</sup>. It is shown the dependence of the level of the groundwater in Ararat Valley from Lake Sevan. The lake is of crucial importance in the economy of the country and is a main source of drinking quality water in the region.

## 19. Wetland Types

### a) presence:

Circle or underline the applicable codes for the wetland types of the Ramsar "Classification System for Wetland Type" present in the Ramsar site. Descriptions of each wetland type code are provided in Annex I of the *Explanatory Notes & Guidelines*.

**Marine/coastal:** A • B • C • D • E • F • G • H • I • J • K • Zk(a)

**Inland:** L • M • N • O • P • Q • R • Sp • Ss • Tp • Ts • U • Va  
• Vt • W • Xf • Xp • Y • Zg • Zk(b)

**Human-made:** 1 • 2 • 3 • 4 • 5 • 6 • 7 • 8 • 9 • Zk(c)

### b) dominance:

List the wetland types identified in a) above in order of their dominance (by area) in the Ramsar site, starting with the wetland type with the largest area.

O – M – Tp – U – Ts – Va – 2 – 1 – Xf – Zg

## 20. General ecological features:

Provide further description, as appropriate, of the main habitats, vegetation types, plant and animal communities present in the Ramsar site, and the ecosystem services of the site and the benefits derived from them.

More than 90% of the total territory of wetland consists of lake Sevan itself (1272 km<sup>2</sup> in 2011).

As far as wetland and aquatic flora is concerned in Lake Sevan such flora occupies two very different zones according to water depth and transparency. Ponds and boggy areas are more important in number in the north of the lake. Small marshy areas are found in the neighborhoods of Tsovinar, Noraduz, Zolakar, Martuni and Lichk villages where the following sedge species grow: *Carex hirta*, *Cyperus longus*, *C.fuscus*, and *Schoenoplectus tabernaemontani* and a number of other species. Peatlands exist as remains of much larger area of what once was known as Gilly lakes system (in different sources from 800 to 1500 ha). Rivers are rich in aquatic vegetation.

The dominant communities of Sevan Basin are mountain steppe, sub-alpine and alpine vegetation with different herb and shrub species of *Astragalus* and Prickly Thrift (*Acantholimon*). The most characteristic arboreal plants of Sevana Mountains are junipers (*Juniperus polycarpus*, *J. oblonga*), Remains of natural oak forests occurred on central part of Sevana Mountains. Vardenis and Geghama Mountains Sweetbrier (*Rosa canina*) is common everywhere.

After water level decrease the dried areas of the former bottom of the lake has been forested by alien species of plants. Artificial forests composed by pine (*Pinus caucasica*), poplar (*Populus canadensis*, *P. simoni*), acacia (*Caragana brevispina*, *C.frutex*), willow (*Salix viminalis*). Sallow Thorn (*Hippophae rhamnoides*) forms almost impassable bush.

On Lake Sevan emergent vegetation exists only on limited calm areas. Pondweeds (*Potamogeton spp.*) are abundant on the depths of 2-5 m. Stonewort (*Chara spp.*) thickets cover the littoral on the depths of 4-8 m. Luxuriant development of aquatic vegetation observed on bogs and ponds.

## 21. Noteworthy flora:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 14, Justification for the application of the Criteria) indicating, e.g., which species/communities are unique, rare, endangered or biogeographically important, etc. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

Based on field observations carried out in 2005 and also literature and herbarium data the flora of Lake Sevan Ramsar site comprises 1619 vascular plants species, of which 1145 species grow in the territory of

the Sevan National Park. The flora of the park is represented by 28 tree species and 42 bush species, 866 perennial herbages, and 209 biennial and annual plant species. The territory of Lake Sevan Ramsar site hosts 23 endemic plant species, 13 of which are endemics to Sevan floristic region. 48 species are included in the Red Book of Armenia. About 60 plant species used or can be used as medicinal plants. About 100 plant species are edible.

267 species, subspecies and types of macroscopic fungi species are known, of which 180 belong to Agaricaceous fungi (Hymenomycetes); 55 to Aphyllophorales (Hymenomycetes), and 32 to Gasteromycetes. About 100 species of mushrooms are edible, 58 species have healing properties, 24 species are poisonous.

On the former bed of the lake artificial forests of pine (*Pinus caucasica*), poplar (*Populus canadensis*, *P. simoni*), acacia (*Caragana brevispina*, *C. frutex*), willow (*Salix viminalis*) have been planted. The Sea Buckthorn (*Hippophae rhamnoides*) forms almost impenetrable thickets.

Based on field observations carried out in 2005-2007 as well as literature and herbarium data the aquatic flora of Lake Sevan comprises 32 species - 11 agamous and 21 vascular plants. Of them 7 species are emergent and 25 species are submerged. Of them most common are algae *Cladophora glomerata*, *Vaucheria dichotoma*, *Chara globularis*, moss *Drepanocladus aduncus*, flowering rush (*Butomus umbellatus*), Spiked Water Milfoil (*Myriophyllum spicatum*), fennel pondweed (*Potamogeton pectinatus*). Emergent vegetation is located in the coves (Lchashen, Artanish) and estuaries of major rivers (Argichi, Gavaraget). Submerged vegetation is distributed much wider in the open lake and occurs at the depths 2-12 m, rarely up to 20 m.

The aquatic flora of Lake Sevan's tributaries comprises 58 species - 2 agamous and 56 vascular plants. Of them 28 species are emergent and 26 species are submerged. Most common plants are algae *Cladophora glomerata*, Water Crowfoot (*Batrachium kauffmannii*), Water Whorl-grass (*Catabrosa aquatica*), Plicate Sweet-grass (*Glyceria notata*), Water Speedwell (*Veronica anagallis-aquatica*); riverside Hairy Willowherb (*Epilobium hirsutum*), Caucasian Mint (*Mentha caucasica*).

The phytoplankton of Lake Sevan is represented by three major groups of algae: green algae (Chlorophyta), blue-green algae (Cyanobacteria) and diatoms (Diatomeae).

## 22. Noteworthy fauna:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 14. Justification for the application of the Criteria) indicating, e.g., which species/communities are unique, rare, endangered or biogeographically important, etc., including count data. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

### Invertebrates

#### Zooplankton

The zooplankton of Lake Sevan consists of 26 species of Rotifera and 18 species of Crustacea (9 species of Copepoda and 9 species of Cladocera).

#### Zoobenthos

The zoobenthos of Lake Sevan is represented by all 3 size groups: meio-, macro- and megabenthos.

The meiobenthos consists of 59 species: 2 Cnidaria, 3 Turbellaria, 23 Nematoda, 1 Tardigrada, 9 Ostracoda, 5 Cladocera, 3 Cyclopoida, 2 Harpacticoida, 11 Hydracarina.

The macrobenthos consists of 93 species: 26 Oligochaeta, 8 Hirudinea, 10 Gastropoda, 6 Bivalvia, 2 Amphipoda, 1 Odonata, 2 Ephemeroptera, 7 Trichoptera, 4 Hemiptera, 27 Chironomidae.

The megabenthos consists of 2 invader species: the fish mussel (*Anodonta piscinalis*) and narrow-clawed crayfish (*Astacus leptodactylus*).

### Vertebrates

The fauna of vertebrates consists of 6 species of fishes (2 species and 1 sub-species are endemic, all in the Red Data Book of Armenia, 3 alien), 4 species of amphibians, 16 species of reptiles (5 in the Red Data Book of Armenia), 267 species of birds (58 in the Red Data Book of Armenia, 90 in the Agreement on the Conservation of *African-Eurasian Waterbird Agreement* of the Bonn Convention on the Conservation of Migratory Species of Wild Animals), 44 species of mammals (10 in the Red Data Book of Armenia).

#### Fish

Fish species in Lake Sevan are represented by Salmonidae (1), Coregonidae (1) and Cyprinidae (4) families. Salmonidae includes endemic Sevan Trout (*Salmo ischchan*), with its four subspecies. The

representative of Coregonidae family is Whitefish (*Coregonus lavaretus*), being acclimatized to the lake through 1924-1927.

The two other endemics of the lake belong to Cyprinidae family: Khrami carp (*Varicorhinus capoeta sevangi*) and Sevan Barble (*Barbus goktschaicus*). In 1978 the Crucian carp (*Carassius auratus gibelio*) has been accidentally entered the lake from water systems of Ararat valley. Another species, recently registered in the lake is Riffle Minnow (*Alburnoides bipunctatus*), which is common in other Armenian watercourses.

### **Amphibians**

Amphibians are abundant everywhere where water exists. Of them most abundant are European Marsh Frog (*Rana ridibunda*) and European Green Toad (*Bufo viridis*).

### **Reptiles**

Of recorded reptiles 11 are lizards and 5 are snakes. Of them European Grass Snake (*Natrix natrix*) and Dice Snake (*Natrix tessellata*) are common everywhere.

### **Birds**

The avifauna of Lake Sevan Ramsar site belongs to the following orders: national park and its buffer zone, belonging to the following taxonomic classification (the detailed list is given as an Annex to this RIS):

Gaviiformes (Loons) = 2  
 Podicipediformes (Grebes) = 5  
 Pelecaniformes (Pelicans) = 4  
 Ciconiiformes (Hérons, Egrets and Ibis) = 12  
 Phoenicopteriformes (Flamingos) = 1  
 Falconiformes (Raptors) = 31  
 Anseriformes (Ducks, Geese, Swans) = 28  
 Galliformes (fowl-like birds) = 3  
 Gruiformes (Cranes and Rails) = 10  
 Charadriiformes (Shorebirds and Gulls) = 57  
 Columbiformes (Pigeons and Doves) = 5  
 Cuculiformes (Cuckoos) = 1  
 Strigiformes (Owls) = 5  
 Caprimulgiformes (Nightjars) = 1  
 Apodiformes (Swifts) = 2  
 Coraciiformes (Bee-eaters, Rollers and Hoopoes) = 4  
 Piciformes (Woodpeckers) = 7  
 Passeriformes (Perching and Songbirds) = 128.

Of them Armenian Gull (*Larus armenicus*) considers as an endemic species.

Ducks, especially paddle ducks are traditionally hunted.

Artificial water-level decrease influenced first of all on the quantity and species composition of breeding waterfowl. From approximately 60 breeders only about 20 are breeding during the last decade. Eurasian Coot (*Fulica atra*), Mallard (*Anas platyrhynchos*) and Armenian Gull at present are among most common breeders.

The lake is important passage for migratory birds, especially during the autumn. Significant numbers of grebes, pelicans, cormorants occur here from October until ice-cover in January. Such a rare birds as Great Egret (*Casmerodius albus*), Glossy Ibis (*Plegadis falcinellus*), swans, Demoiselle Crane (*Grus vigro*) are registered here regularly during the migrations.

### **Mammals**

According to the outcomes of 2005 field surveys and data of relevant literature, the following 44 species of mammals are found in the territories of the national park and its buffer zone, belong to the following orders:

Insectivora (Insect eaters) - 7 species;  
 Rodentia (Rodents) - 15 species;  
 Logomorpha (Double-toothed rodents, hares) 1 species;  
 Chiroptera (Bats) - 7 species;  
 Carnivora (Carnivores) - 11 species  
 Artiodactyla (Hoofed mammals) - 3 species.



The most typical mammals in the basin are hare (*Lepus europaeus*), fox (*Vulpes vulpes*), wolf (*Canis lupus*), jackal (*Canis aureus*), Stone Marten (*Martes foina*), and most of the rodents. Among the mammals which are ecologically depended on wetlands, the Water Vole (*Arvicola terrestris*) is very common. Recently European Otter (*Lutra lutra*) has been recorded for the first time after early 1960's.

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### 23. Social and cultural values:

a) Describe if the site has any general social and/or cultural values e.g., fisheries production, forestry, religious importance, archaeological sites, social relations with the wetland, etc. Distinguish between historical/archaeological/religious significance and current socio-economic values:

The lake causes an interest of local inhabitants mostly because of fish resources.

The basin of the lake provides local inhabitants with eatable plants and mushrooms, fuel wood.

There is an interest in productive agriculture, especially cattle breeding and recently tobacco growing.

The industrial enterprises are declined.

Religious importance Lake Sevan Ramsar site consists in presence of many operating and not-operating churches of IX-XX centuries which are traditional pilgrimage areas. Theological Seminary of Armenian Apostolic Church is situated on Sevan Peninsula.

Archaeological, historical and architectural relics from the early Stone Age until the late Middle Age (the cliff drawings of hunting scenes of 7,000 B. C., the ruins of citadel of 600 B. C., early Christian shrine and funerary steles of 4th century, the monastery of 9<sup>th</sup> century, etc.) are important heritage for all Armenians living in the country and abroad.

Beautiful landscapes, cool water, fresh air and close location to the capital attract dozens of thousands people every weekend during hot summer. Lake Sevan and its basin are in the focus of Government to develop all-year-round tourism industry.

b) Is the site considered of international importance for holding, in addition to relevant ecological values, examples of significant cultural values, whether material or non-material, linked to its origin, conservation and/or ecological functioning?

If Yes, tick the box  and describe this importance under one or more of the following categories:

- i) sites which provide a model of wetland wise use, demonstrating the application of traditional knowledge and methods of management and use that maintain the ecological character of the wetland:
- ii) sites which have exceptional cultural traditions or records of former civilizations that have influenced the ecological character of the wetland:
- iii) sites where the ecological character of the wetland depends on the interaction with local communities or indigenous peoples:
- iv) sites where relevant non-material values such as sacred sites are present and their existence is strongly linked with the maintenance of the ecological character of the wetland:

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### 24. Land tenure/ownership:

a) within the Ramsar site:

Sevan National Park together with the lake surface comprises 147,456 ha, of which the lake surface is 127,070 ha (as of 1 January 2011) and the land 20,386 ha. Lake Sevan and surrounding land territory of Sevan National Park are state owned.

The area of the external protective zone is 342,775 ha. Most of the land of external protective zone belongs to 93 communities situated in the Ramsar site or private owned; not being used lands (badlands) are state owned.

b) in the surrounding area:

not applicable

**25. Current land (including water) use:**

a) within the Ramsar site:

Water supply for agricultural, domestic and industrial (including electricity generation) use. Fishery (fish and crayfish), cattle watering in Lake Sevan and its tributaries, pasture and hay making. Provision of services for recreation and tourism. Scientific research.

b) in the surroundings/catchment:

not applicable

**26. Factors (past, present or potential) adversely affecting the site's ecological character, including changes in land (including water) use and development projects:**

a) within the Ramsar site:

**Water Withdrawal**

The so-called *Sevan Problem* arose in the XIX century. High location of the Lake Sevan over the fertile but arid Ararat Valley attracted engineers to elaborate projects of using the water of the lake for irrigation. Primarily, the challenge was how to use the water resources of the lake. Lake Sevan has been recognized as a key potential water resource. The high location of the lake compared to the fertile, but arid Ararat Valley, and lack of energy resources in the country attracted the engineers to find methods to explore the water of the lake intensively. Taking into account the water balance of Lake Sevan, where evaporation (800 mm year<sup>-1</sup>) largely exceeds direct precipitation (360 mm year<sup>-1</sup>), an Armenian engineer named Suqias Manasserian, in his book entitled *The Evaporating Billions and the Stagnation of Russian Capital* (1910), proposed to use water resources intensively for irrigation and hydropower generation.

By dropping the original water level by 50 m, his plan was to reduce evaporation almost six times by completely drying Major Sevan and leaving a shrunken Minor Sevan of about 240 km<sup>2</sup> compared to 1,416 km<sup>2</sup> for the original lake.

Manasserian's proposal became as a major Soviet project under the direction of the central authorities of the USSR. The project started implementation in 1933 when the bed of Hrazdan River was excavated and a tunnel was bored some 50 m under the lake. The tunnel was inaugurated in 1949 as a major achievement of socialism, and the lake level started to drop at a rate exceeding 1 m per year. The water was used for irrigation, and six hydropower stations began to produce electricity.

Very soon the problem of how to use water resources was reversed into how to use wisely all natural resources, and the water in particular. By the 1950's it had become evident that the ecological and economic consequences of extensive exploitation of the water of the lake were too undesirable to continue in the same way. Human activities have had such negative effects as water level decrease, deterioration of a water quality, destruction of natural habitats and loss of biodiversity.

Water loss is the most important threat. Artificial increase of the outflow from Lake Sevan resulted by 2001 in the drop of the lake level of 20 m (from 1916 to 1896 m), decrease of the volume from 58.5 to 32.9 km<sup>3</sup> (44%), and reduction of the surface area from 1,416 to 1,236 km<sup>2</sup> (13%).

A project to increase the water level of the lake at least on 6 m is implemented in practice from 2001 (After adoption of the Law on Lake Sevan). As of 1 January 2011 compared to minimal conditions the water level increased on 3 m, surface on 35 km<sup>2</sup> and the volume on 0.8 km<sup>3</sup>.

**Internal Natural Factors**

The most important internal natural factors of physical origin that should always be considered are the chemical composition of the water, water transparency, oxygen and temperature regimes.

Qualitative and quantitative development of phyto- and zooplankton, phyto- and zoobenthos, and fish stocks forms ecological food chain (Table 2).

	1920's	1930's	1940's	1950's	1960's	1970's	1980's	1990's	2000's
PP	2400	2400	4100	4600	12700	19000	11600	18800	15000
SP	620	690	620	520	740	1330	630	890	750

FP	34	43	43	45	46	53	81	60	25
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### ***Internal Human Induced Factors***

The ecological conditions of Lake Sevan currently depend on human activities which influence mainly on hydrology and trophic status of the lake.

The following human induced activities negatively affect the ecological status of the lake: sewage, agricultural and industrial pollution, soil erosion, illegal fishing, unauthorized logging, overgrazing, water logging.

It is evident the trophic status of the lake largely depends on human impact on water balance and pollution, as well as on vegetation waterlogged due to recent water level increase.

### ***External Natural Factors***

Weather impact, particularly droughts, cause serious impact especially during breeding period of fish and waterfowl: drying up of rivers and wetlands negatively impacts the spawning and nesting conditions of fish and waterfowl.

### ***External Human-Induced Factors***

The ecosystem of Lake Sevan Basin is comparatively well separated from external human induced factors due to bordering ridges, which are 1.5 km higher than the lake. Since 1981 the water from Arpa River flows into Lake Sevan through a tunnel. The impact of "alien" water on Lake Sevan has had no apparent pronounced effect on overall water quality in the lake.

### ***Factors Arising from Legislation and Traditions***

Inadequacies of existing legislation in Armenia are obstacles to good management of the lake, and Sevan National Park in particular. Many traditional activities, such as reed harvesting, edible and pharmacological plant collecting, and buffalo breeding have been forgotten. The return of traditional rights to the local inhabitants, after the 75-year-long Communist experiment, should be carried out in combination with measures to protect nature. One of the first important steps in this direction occurred in 1996, bringing into the force a licensed traditional fishery. However, the current licensing system is far from perfect because of bureaucratic obstacles and high margins of payments for use of natural resources.

b) in the surrounding area:  
not applicable

## **27. Conservation measures taken:**

a) List national and/or international category and legal status of protected areas, including boundary relationships with the Ramsar site:

In particular, if the site is partly or wholly a World Heritage Site and/or a UNESCO Biosphere Reserve, please give the names of the site under these designations.

Lake Sevan, the downstream of its tributaries, some marsh and pond areas are situated in the territory of Lake Sevan National Park. Part of open juniper and oak woodlands on the slopes of Sevan Ridge has a status of state sanctuary. The whole Ramsar site is situated in the buffer (support) zone of the National Park.

b) If appropriate, list the IUCN (1994) protected areas category/ies which apply to the site (tick the box or boxes as appropriate):

Ia ; Ib ; II ; III ; IV ; V ; VI

c) Does an officially approved management plan exist; and is it being implemented?:

The Management Plan of «Sevan» National Park was developed in the framework of Natural Resources Managements and Poverty Reduction Project funded by the World Bank and approved by the Government Decision N 204-N of 18 January 2007. This plan is developed and implemented for 2007-2011.

d) Describe any other current management practices:

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**28. Conservation measures proposed but not yet implemented:**

e.g. management plan in preparation; official proposal as a legally protected area, etc.

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**29. Current scientific research and facilities:**

e.g., details of current research projects, including biodiversity monitoring; existence of a field research station, etc.  
«Sevan» National Park SNCO has his scientific department in Sevan. However, main research is carried out by the institutions of National Academy of Sciences: Institute of Botany, Scientific Center for Zoology and Hydrobiology.  
Government funds are limited to estimation of fish and crayfish commercial resources.

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**30. Current communications, education and public awareness (CEPA) activities related to or benefiting the site:**

e.g. visitors' centre, observation hides and nature trails, information booklets, facilities for school visits, etc.  
The booklet "Sevan National Park" is printed every year using state sources. In the basis of booklet information and pictures are data and photos made in frames of Ramsar SGF 1997, 1999 and 2006 funded projects.  
The web-page of Sevan National Park is [www.sevanpark.am](http://www.sevanpark.am)  
In 1996 the Museum of Nature is created in Sevan National Park with facilities for lectures for pupil and students.

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**31. Current recreation and tourism:**

State if the wetland is used for recreation/tourism; indicate type(s) and their frequency/intensity.  
The Government pays great attention to tourism development in the basin of Lake Sevan. Numbers of tourist trails are developed within and around the territory of Sevan NP. If traditional tourism is linked with summer recreation recent efforts were done to extend tourism season. In particular, 1150 m long ropeway and ski trails constructed in 2010 near Sevan Peninsula.

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**32. Jurisdiction:**

Include territorial, e.g. state/region, and functional/sectoral, e.g. Dept of Agriculture/Dept. of Environment, etc.  
government authority with *territorial jurisdiction* Ministry of Territorial Administration  
Government Building 2, Republic Square, 0010 Yerevan, Armenia  
government authority with *functional jurisdiction* for conservation Ministry of Nature Protection  
Government Building 3, Republic Square, 0010 Yerevan, Armenia.

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**33. Management authority:**

Provide the name and address of the local office(s) of the agency(ies) or organisation(s) directly responsible for managing the wetland. Wherever possible provide also the title and/or name of the person or persons in this office with responsibility for the wetland.  
"Lake Sevan" National Park State Non-commercial Organization;  
Director Ashot Gndoyan, office phone +371 261 24044.  
Temporary postal address: Mr. N. Simonyan, Deputy Director for science "Lake Sevan" National Park"  
SNCO, Sevan Town, Gegharquniq Marz, Armenia

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**34. Bibliographical references:**

Scientific/technical references only. If biogeographic regionalisation scheme applied (see 15 above), list full reference citation for the scheme.  
Adamian, M., 1985. The Birds of Armenia. Vol. 1, Yerevan: 232 pp. [in Armenian]  
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