

# Information Sheet on Ramsar Wetlands (RIS)

— 2009-2012 version

Available for download from [http://www.ramsar.org/ris/key\\_ris\\_index.htm](http://www.ramsar.org/ris/key_ris_index.htm).

*Categories approved by Recommendation 4.7 (1990), as amended by Resolution VIII.13 of the 8<sup>th</sup> Conference of the Contracting Parties (2002) and Resolutions IX.1 Annex B, IX.6, IX.21 and IX. 22 of the 9<sup>th</sup> Conference of the Contracting Parties (2005).*

## Notes for compilers:

1. The RIS should be completed in accordance with the attached *Explanatory Notes and Guidelines for completing the Information Sheet on Ramsar Wetlands*. Compilers are strongly advised to read this guidance before filling in the RIS.
2. Further information and guidance in support of Ramsar site designations are provided in the *Strategic Framework and guidelines for the future development of the List of Wetlands of International Importance* (Ramsar Wise Use Handbook 14, 3rd edition). A 4th edition of the Handbook is in preparation and will be available in 2009.
3. Once completed, the RIS (and accompanying map(s)) should be submitted to the Ramsar Secretariat. Compilers should provide an electronic (MS Word) copy of the RIS and, where possible, digital copies of all maps.

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### 1. Name and address of the compiler of this form:

State Agency on Environmental  
Protection and Forestry  
Government of the Kyrgyz Republic  
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Designation date

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Site Reference Number

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

27 November, 2010

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### 3. Country:

Kyrgyz Republic

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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.

Son-Kol Lake

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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:**

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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 general location map, showing the location of the Ramsar site within the territory of the Contracting Party, is also extremely useful.

**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.

Land surface: from the river Kadjyrtty to the river Ak-Tash one-kilometer riparian around the lake and from the river Ak-Tash to the river Kadjyrtty 2-kilometer riparian, including marshes located between Kok-Bulak brook and a burial ground. The Karatal-Japyryk State Nature Reserve lies within the Ramsar site.

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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.

Centre of lake: 41°50'N 75°07'E

To ensure that other coordinates are correct, suggest to re-check coordinates from numbers 2-5.

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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.

- Nearest human settlement: about 50 km of Tolok village (population 5 000 people);
  - Nearest city/town: about 170 km NW of Naryn Township (population-300 000 people);
  - Administration Region: Naryn Oblast (region) (please refer to the map of administration division of the Kyrgyz Republic in the annex)
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**10. Elevation:** (in metres: average and/or maximum & minimum)

Average – 3026.2 meters above sea level (m ASL)

Minimum – 3015.2 m ASL (water surface)

Maximum – 3092 m ASL (hill in the north)

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**11. Area:** (in hectares)

Total area – 36869.4 ha, including: land area – 8912.2 ha; Water surface – 27957.2 ha.

**12. General overview of the site:**

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

Son-Kol Lake is a high altitude freshwater lake lying at the altitude of 3015.2 m ASL in central Kyrgyzstan. The lake is surrounded by mountain ridges with average height of 4000 meters above sea level, with the characteristics of as a treeless high-mountain meadow. There is an outflow, the Kokjerty River, flows east of the lake to join the Naryn River, a tributary of the Syr Darya River. Much of the lake bottom is covered with submerged macrophytes, down to a depth of at least 7 m, the deepest part being in the west-central portion at 13.2 m. Besides the open water habitat, there is an extensive area of sedge marsh around the outflow in the east of the lake and an interesting pair of gravel spits enclosing the marsh exposed to considerable wave action caused by westerly winds. The lake is important for a number of migrating water-birds. A great diversity of bird's fly from the Himalayas and stay for a short period around the lake. According to Davletbakov and Ostashenko (2005), there are 70 recorded species of waders. Breeding colonies of several grebe species are to be found within the protected part of the Lake with a few outside the reserve. Gulls and terns breed on the shores of the protected area. The lake ecosystem has been considerably affected by the introduction of trout, and the whitefish, *Coregonus peled* and *C. laveratus*, to this originally fishless lake. The Gray Loach (*Noemacheilus dorsalis*) and Naked Osman (*Diptychus dybomskii*) were accidentally introduced with the two whitefish species. The zooplankton community has shifted from large forms which were probably important food sources for some waterbirds, to small forms; with a corresponding decrease in the number of waterbird species.

**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

**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).

**Criteria 2:**

Bird species included into the Red Data Book of the Kyrgyz Republic and also IUCN, CMS and CITES Lists.

English Name	Scientific Name	National Status	CITES Status	CMS Status	IUCN Status
Great Bustard	<i>Otis tarda</i>	III, Critically Endangered	-	Appendix 1	Vulnerable
Black Stork	<i>Ciconia nigra</i>	VI, Near Threatened	Appendix II	Appendix II	Least concern
Demoiselle Crane	<i>Anthropoides virgo</i>	VI, Near Threatened	-	Appendix II	Least concern
Bar-headed Goose	<i>Anser indicus</i>	VI, Near Threatened	-	Appendix II	Least concern
Ferruginous Pochard	<i>Aythya nyroca</i>	VI, Near Threatened	Appendix III	Appendix I	Near Threatened
Pallas's or Great	<i>Larus</i>	VI, Near Threatened	-	-	Least concern

black-headed Gull	<i>ichthyaetus</i>				
European Spoonbill	<i>Platalea leucorodia</i>	VI, Near Threatened	Appendix II	-	Least concern

**Criterion 3:**

There are 70 registered species of waders with a variety of breeding bird colonies around the lake. This lake is unique in the Republic due to the diversity of birds. The extreme mountain conditions make its fauna easy-vulnerable.

Few species include the Black Stork (*Ciconia nigra*) and Demoiselle Crane (*Anthropoides virgo*) which use the surrounding marshes together with their juveniles. Many duck species breed in the marshes of the reserve. Gulls, terns and several Grebe species breed in the protected part of the lake. Bird species included into the Red Data Book of the Kyrgyz Republic and also IUCN List were revealed in the wetland: Black Stork, Bar-headed Goose (*Anser indicus*), Great black-headed Gull (*Ichthyaetus ichthyaetus*), Ferruginous Pochard (*Aythya nyroca*), Whooper Swan (*Aythya nyroca*), Red-breasted Merganser, Great Bustard, and European Spoonbill.

Also, there are important birds of prey were registered in the surrounding mountains such as Black Vulture (*Coragyps atratus*), Golden Eagle (*Aquila chrysaetos*), Barbary Falcon (*Falco pelegrinoides*), Himalayan Griffon (*Gyps himalayensis*). For other species, see refer to Annex 1 and 2

**Criterion 4:**

The lake is an important breeding area for several IUCN Red Data Book and Red Data Book of the Kyrgyz Republic species. These include Bar-headed Goose (*Anser indicus*), Whooper Swan (*Cygnus cygnus*), several grebes (*Podiceps* spp.) and gulls (*Larus* spp.). Other species using the lake for breeding include Greylag Goose (*Anser anser*), Black-tailed Godwit (*Limosa limosa*), Black-necked Grebe, Ruddy Shelduck (*Tadorna ferruginea*), Mallard (*Anas platyrhynchos*), Pintail (*Anas acuta*), Garganey Teal (*Anas querquedula*), Tufted Duck (*Aythya fuligula*), Mongolian Dotterel (*Charadrius mongolus*), Northern Lapwing (*Vanellus vanellus*), Redshank (*Tringa tetanus*), Common Tern (*Sterna hirundo*) etc. The surrounding grasslands are used by Black Stork (*Ciconia nigra*), Demoiselle Crane (*Anthropoides virgo*) and several birds of prey.

A great diversity of birds fly from the Himalayas and stay for a short time around the lake. There are not only thousands of individuals of waders, ducks and geese among them, as well as small Oscines, swifts, hoopoes, etc, using this area for refuge and for resting. The lake is an important point for stopovers and rest during the moulting season and after migration and it has a great meaning for their conservation.

A flock of Goosanders (*Mergus merganser*) use the area of the outflow in the east of the lake for moulting. Over 1,000 ducks of different species breed, feed or rest on the lake. Following species were registered in the lake during their migration: *Anas acuta* – Pintail (more than 2000 individuals), *Anas chrypeata* – Shoveler (> 100), *Anas crecca* - European Teal (> 1000), *Anas penelope* – wigeon (100-150), *Anas platyrhynchos* - Mallard duck (> 500), *Anas querquedula* - Garganey Teal (>500), *Anas strepera* – Gadwall (50-100), *Aythya ferina* – Common Pochard (> 1500), *Aythya fuligula* - Tufted duck (100-150), *Aythya nyroca* - Ferruginous Pochard (> 100), *Charadrius mongolus* - Mongolian Dotterel (>100), *Corvus frugilegus* – Rook (100-200), *Fulica atra* - Common Coot (100-150), *Larus ichthyaetus* - Great black-headed Gull (> 200), *Larus ridibundus* - Black-headed Gull (> 1000), *Limosa limosa* - Black-tailed Godwit (> 100) etc. (Annex)

**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:**

Palaearctic Montane grasslands and shrublands

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

Kyrgyz Academy of Sciences (1987). Zoogeographical regionalization. *The Atlas of the Kyrgyz Republic*, Volume I. Moscow, page 123. (In Russian)

**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.*

Son-Kol Lake is the largest freshwater lake in Kyrgyzstan, situated in Son-Kol basin at the altitude of 3015.2 m ASL and surrounded by the mountain ridges with average height of 4000 meters above sea level; the mountain ridges of Son-Kol Too in the north and Boor-Albas in the south is characterized as a treeless high-mountain meadow. The lakesides are mostly sloping and 3-6 km distant from the mountain ridge foot. Only in the northern part, the mountains are close to the lake and the lakesides are steeply stretched to the lake.

Son-Kol Lake has tectonic origin. The lake is 29 km long and 18 kilometers wide with the maximum depth of 13.2 m. The water surface area is 292 square km, the length of shoreline is 96-102 m. The drainage area is 1120 square km. The water is fresh and the pH is between 7 and 8. Water mineralization fluctuates from 465 mg/liter in summer to 306 mg/liter in winter. Water balance is 115 million m<sup>3</sup>/year. The transparency of the water is very high, up to a depth of 7 m, although the transparency may be reduced up to 3.5-5 m due to bottom sediments being suspended during windy periods. Water level fluctuation amplitude varies between 100-150 cm and mineralization between 0,213–0,346 gram/liter. The lake has an ellipsoid form, tapering to the southeast, from which the outflow (Kokjerty River) flows SE into the Naryn River, a tributary of the Syr Darya River.

The average temperature in the lake basin in January is -20°C, and in July +11°C. Average precipitation is 300-400 mm during the warm period (April-October), and 100-150 mm during winter (November-March). The duration of snow cover in the lake basin is 180-200 days a year, the lake freezes in winter and the thickness of the ice cover can reach 1-1.2 m. The ice cover on the lake shore starts to thaw in the middle or at the end of April. The ice fully disappears by late May. The lake is drained by the Syr-Darya River Basin.

Areas of marsh are found lining the lake on its south and western shores, whilst there is an extensive area of herbaceous marsh in the eastern section, bounded by two spits which project into the lake. In contrast to the marshy areas lining the lake, these spits are composed of gravel due to strong wave action from the predominantly westerly winds.

There are mountainous chesnut soils, meadow, meadow-marsh, partly alkaline soil types. No detailed information on soil.

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

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

The catchment area of the lake is small (about 845 square kilometers) and being composed of a tight ring of encircling mountains which enclose the highland basin. Between the mountains and the lake are gently sloping areas of grassland. The lake is bounded to the NW by the Son-Kol Too Ridge, to the NE by the Korgo and Booralbas Ridges and to the south the Moldo-Too Ridge. The mountains rise to 4,000 m ASL in the north and 3,900 m ASL in the south. The catchment area is characteristic of a treeless high-mountain meadow (locally called Syrt).

Water flows into the lake along more than forty channels, the most of which are temporary and flow reaches a high only during snow-melting periods. There are 8 rivers: Aktash, Jamanichke, Kokbulak, Karakiche, Kurtka, Tashtobe, Kumbel, Kumdusuu which regularly flow into the lake. Unit area discharge varies from 8 to 10 liter/sec\*sq.km.

Climate is continental, typical for high altitude mountains.

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**18. Hydrological values:**

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

The lake is important for maintaining flows in the Naryn River, for livelihood maintenance of local pastoralists and also for watering of animals, livestock.

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**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** (permanent more than 8 ha),

**Va** (high altitude marshes),

**Tp** (marshes permanent herb-dominated),

**Ts** (marshes seasonal herb-dominated),

**M** (permanent river, streams),

**N** (seasonal rivers streams)

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**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.

Much of the lake bottom is covered with a variety of submerged macrophytes due to the high transparency of the water. Plant growth can occur to a depth of least 7.3 m. *Myriophyllum* and a *Potamogeton* species with filiform leaves similar to *P. pectinatus* are most common in the shallower areas, whilst the macroscopic algae *Chara*, and also possibly *Nitella*, seem to occur in deeper waters. Much of the lake, especially in the south and southwest, is ringed by a band of sedges of varying thickness. A large marsh area has developed around the outflow, especially to the north, which is

composed mainly of sedges, with some areas of *Juncus* and the horsetail, *Equisetum*. The substrate of this herbaceous marsh is thickly covered with moss. A large shallow lagoon has developed behind the northern spit, which is densely covered with *Myriophyllum*.

The zooplankton density seems to be low and is composed of mainly small forms, with the cladoceran *Bosmina* and the predatory rotifer *Asplanchna* being dominant. The large dinoflagellate *Ceratium* is also common. The amphipod, *Gammarus krevetki*, is found in very low numbers, but in the past seemed to be very common.

Prior to 1957, the lake was fishless due to large waterfalls on the outflow river, effectively isolating the lake from colonisation. In 1957, fish introduction trials were carried out, with species of trout, the Naked Osman (*Diptychus dybowskii*) and the Whitefish (*Coregonus laveratus*) and *Coregonus peled* acclimatized well and is now the dominant fish in the lake, whilst the others disappeared, or are found in very low numbers.

## 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.*

None of the submerged macrophytes in the lake are endangered or vulnerable. However, the flora of the gravel spits, although not strictly a wetland flora, is noteworthy. It differs considerably from the vegetation in other areas surrounding the lake and is composed of low-growing mountain herbs such as gentians, edelweiss and *Sempervivum*, together with lichens. Some of these herbs may be rare or restricted in distribution.

## 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.*

Several waterbird species are worthy to note. The, Black Stork (*Ciconia nigra*) and Demoiselle Crane (*Anthropoides virgo*) mentioned in criteria 2 feed in areas close to the lake, especially with their juveniles, there is a rich diversity of birds of prey found in the lake surroundings. The table also includes waterbirds which are not recognised as being internationally threatened.

The list of rare and endangered species registered in Son-Kol Lake and surrounding mountains.		
Species	IUCN Red List (category, status)	Red Data Book of KR (category, status)
<i>Cygnus cygnus</i> - Whooper Swan	LC	VII, LC
<i>Larus ichthyaetus</i> – Pallas's or Great black-headed Gull	LC	VI, NT
<i>Mergus serrator</i> - Red-breasted Merganser	LC	VII, LC
<i>Otis tarda</i> - Great Bustard	Vu	III, CE
<i>Platalea leucorodia</i> – European Spoonbill	LC	VI, NT
<i>Aegypius monachus</i> - Cinereous Vulture	LC	VI, NT
<i>Aquila chrysaetos</i> - Golden Eagle	LC	VI, NT
<i>Falco cherrug</i> - Saker Falcon	Vu	IV, EN
<i>Falco peregrinoides</i> - Barbary Falcon	-	VII, LC
<i>Gypaetus barbatus</i> - Lammergeier	LC	VI, NT
<i>Gyps himalayensis</i> - Himalayan Griffon	LC	VII, LC
<i>Haliaeetus leucoryphus</i> - Pallas's Fish Eagle	Vu	V, VU

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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:

- Social values: The basin is considered as the outrun summer pasture, which is mainly used for transhumance. Pastoralists from four districts of Naryn Oblast (province) move up to Son-Kol Lake basin for their livestock seasonally.
- Recreational values: Located in the Great Silk Way Son-Kol Lake basin is the mostly visited tourist area in the Naryn Oblast; it is included in the complex tourist routes. Some of local people from adjoining four districts host tourists in a traditional setting (traditional yurt camps, national food and drink etc)
- Cultural and archeological values: Historically the lake plays an important role as a meeting place for many tribes. There are numerous historic and cultural archeological monuments such as burial mounds, stone monuments etc. “Tash-Tulga” stone monument located in the southern part of the lake is surrounded by legends and fairy-tales. “Tash-Tulga” stone monument related to approximately 10th century represents gigantic stone hearths, with a diameter of 1-1.3 m.
- Religious values: Local people consider Son-Kol Lake and its basin a sacred place. Some of the monuments have religious meaning, some people visit this place for praying.

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? **NO**

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: Stateland
  - b) in the surrounding area: Stateland
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**25. Current land (including water) use:**

a) within the Ramsar Site

The lake was fishless prior to 1957, fish introductions commenced in order to “make use” of the lake’s resources. *Coregonus peled* is now the dominant fish in the lake. However, due to overfishing, there is now a five-year ban on fishing according to the “*Law of the Kyrgyz Republic about the ban on fishing, transporting, purchasing, selling and removal of valuable and endemic fish species in Issyk-Kul and Son-Kol Lakes*” dated August 4, 2008 #191.

About 23.4% of the site has a protected status – it is a part of the Karatal-Japyryk State Nature Reserve.



b) in the surroundings/catchment

The surrounding grassland has been used as a summer pasture for grazing of sheep, cattle and horses from May to October. There are several tourist camps around the lake utilizing local tents (yurts). Under jurisdiction of the local government of Naryn Oblast.

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**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

- In July, 1959 the ichthyologists introduced fishes of the local origin into the Son-Kol Lake. 13 thousand of *Diptychus maculatus* from Tyulek River, 70 diptychus and loaches (*Nemacheilus dorsalis*) from the Family: Noemacheilus. Later on, they introduced species such as Sazan-carp (*Cyprinus carpio* L), Issyk-Kul Trout (*Salmo isyko-gegarkuni*), peled (*Coregonus peled*), whitefish (*Coregonus laveratus*), tench (*Tinca tinca*). Since the sixties, the following number of fish was introduced into the lake: in 1960 - 4500 of *Issyk-kul diptychus*; in 1961 - 10 000 of young *Issyk-kul diptychus*, in 1966-1978 peled and white-fish; in 1974 and 1978 whitefish was introduced again. Thus, during the twenty years the lake was stocked with different species of fish. The stages varied from sexually mature individuals to larva, which led not only to fish production but also to the appearance of undesirable species in ichthyofauna.
- The most profound change has been the introduction of fish into the lake, which was previously fishless. This has had an effect on the waterbirds using the lake. Some bird species such as *Podiceps cristatus* and *Larus ridibundus* showed increased breeding numbers after fish introductions, but more critical species such as grebes, *Anas acuta* and *Sterna hirundo*, decreased markedly in number or have disappeared from the area. Breeding numbers of *Anser indicus* decreased most likely due to disturbance and shortage of food for their juveniles. There was no ecological assessment or justification carried out before the introduction of fish.
- The fish introductions have probably altered the composition of the zooplankton community markedly. Previously, the zooplankton community was similar to that in the fishless Chatyr Kul, with larger numbers of *Gammarus krevetki*. However, there seems to have been a dramatic shift to smaller species, since *Coregonus peled* is a planktivore. The disappearance or decrease of several waterbird species at the site is probably due in part to competition for food resources with *Coregonus*.
- The gill nets used in the fishery were/are often left in the water for considerable periods or abandoned, proving a hazard to waterbirds and killing fishes unnecessarily.
- In 1979, insecticide was used to control an outbreak of locusts around the lake, and it seems that there was leakage into the lake. About 300 mt of fish were immediately killed and the ecosystem would have been affected. After this incident, fishing was banned for ten years, until 1989. However, current analysis of fish tissues reveals that there are no residual effects from this pesticide (Kustareva, 2005).
- Due to wind storms three small islands of waterbirds nesting in Kaz-Uya were eroded.

b) in the surrounding area

- During the Soviet period the surroundings were extensively used as grazing grounds for livestock. The landscape was overgrazed and degraded. Today, the condition of surrounding pastureland has recovered.
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**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.

Karatal-Japyryk State Nature Reserve is a part of Son-Kol (23.4% of the Ramsar Site). In March 25, 1971, the Kyrgyz SSR Council of Ministers accepted the resolution #106 "About measures on reproduction and protection improvement of the wild geese at the territory of Kyrgyzstan", and resolved to establish the state nature reserves in Son-Kol Lake with Chatyr-Kol lake. In March 31, 1989, Son-Kol was part of Issyk-Kul Reserve on the basis of resolution of the Kyrgyz SSR Council of Ministers "About additional measures on reproduction of the mountain geese". In 1998, the protected area in Son-Kol Lake along with Chatyr-Kol site was transferred to the Karatal-Japyryk State Nature Reserve, as its territory borders with Son-Kol basin).

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?:

No. The protected area operates in accordance with its regulation, annual action plan, approved by the SAEPF KR. However, there is no special action plan for wetland management.

d) Describe any other current management practices:

Due to overfishing in the non-protected part of the lake, there is a five-year ban for fishing according to the "Law of the Kyrgyz Republic about the ban on fishing, transporting, purchasing, selling and removal of valuable and endemic fish species in Issyk-Kul and Son-Kol Lakes" dated August 4, 2008 #191.

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

- The draft of the management plan was prepared, however it is not approved yet.
- Although it is regrettable that fish were introduced in the past without a proper ecological assessment of all the consequences, it is still possible to manage the entire area and enhance its ecological values together with controlled of fishing.
- It is recommended that the small islands eroded by ice and wind be rehabilitated. These islands were nesting sites for goose and waders.

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

e.g., details of current research projects, including biodiversity monitoring; existence of a field research station, etc.

There are no facilities for research around the lake. Waterbird surveys are carried out on a regular basis, whilst there is some study from the Academy of Sciences, Bishkek, and the Issyk Kul Fisheries Station on the ecology and fishery of the lake. However, currently research activities are limited due to shortage of funding.

**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.

CEPA activities are carried out by the Karatal-Jpyryk State Nature Reserve and the State Agency on Environmental Protection and Forestry of the Kyrgyz Republic e.g. Information leaflets have been prepared and distributed among local people and in Naryn Town. Also the administration carries out environmental education activities such as lectures at the high schools of Naryn Town and reflects wetlands issues by publishing articles in local newspapers.

**31. Current recreation and tourism:**

State if the wetland is used for recreation/tourism; indicate type(s) and their frequency/intensity.

There is no tourism and recreation associated with the lake itself; however the basin of the lake has recreational values. There are at present tourist camps around the lake during the summer where visitors stay over night. Main tourist activities: horseback riding, overnight in a traditional yurt, kumys-treatment (maremilk), etc.

**32. Jurisdiction:**

Include territorial, e.g. state/region, and functional/sectoral, e.g. Dept of Agriculture/Dept. of Environment, etc.

State Agency on Environmental Protection and the Forestry of the Kyrgyz Republic (protected part of the lake) and the Local Government of Naryn Province (non-protected part of the lake)

**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.

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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.

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13. Vorobeev, G.G. & Van der Ven, J. (2003) Looking at mammals in Kyrgyzia. Bishkek, Kyrgyzstan.

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