

Designation date: 12/11/2002 Ramsar Site no. 1231

Information Sheet on Ramsar Wetlands (RIS) – 2009-2014 version

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Categories approved by Recommendation 4.7 (1990), as amended by Resolution VIII.13 of the 8th Conference of the Contracting Parties (2002) and Resolutions IX.1 Annex B, IX.6, IX.21 and IX. 22 of the 9th 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 17, 4th edition).
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.

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

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Designation date

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Site Reference Number

2. Date this sheet was completed/updated:

20 January, 2013.

3. Country:

Kyrgyzstan

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.

The Issyk-Kul State Nature Reserve with the Issyk-Kul Lake

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

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:

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 Issyk-Kul Ramsar Site boundary is the same with the Issyk-Kul State Nature Reserve and Issyk-Kul Lake boundaries.

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.

42° 25' 0" N, 77° 15' 0" E

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.

Kyrgyzstan, North-East part, Issyk-Kul region

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

1608 m. a.s.l.

11. Area: (in hectares)

The Ramsar Site's total area is 626 438,5 ha. (This includes 16 732 ha water + terrestrial 2 838,5 ha of the Issk-Kul State Nature Reserve)

12. General overview of the site:

Issyk-Kul Lake is high altitude, deep, light salted, unfrozen lake. The Issyk-Kul Lake is the habitat of native fishes and important wintering area for waterfowl and semi-aquatic birds. There are 60-70 thousand wintering waterfowls in the Ramsar Site. This was one of the main reasons for the inclusion of the Issyk-Kul Lake and Issyk-Kul Reserve in the List of Wetlands of International Importance.

There are 267 bird species, out of 18 species are included in the Red Data Book of the Kyrgyz Republic and 3 are in the IUCN Red List: Ibis bill (*Ibidorhyncha struthersii*), Bar-headed Goose (*Anser indicus*), White-headed Duck (*Oxyura leucocephala*). The Issyk-Kul lake is the place for wintering birds like Dalmatian Pelican (*Pelecanus crispus*), Great Flamingo (*Phoenicopterus ruber*), Whooper Swan (*Cygnus cygnus*) and White-tailed Eagle (*Haliaeetus albicilla*).

Issyk-Kul Lake is the habitat of 28 fish species, from them 7 - endemics to Issyk-Kul Lake. They are *Gobio gobio lepidolaemus* Kessler 1872; *Leuciscus bergi* Kaschkarov, 1925; *Leuciscus schmidti* (Herzenstein, 1896); *Pboxinus issykkulensis* Berg, 1912; *Schizothorax issykkuli* Turdakov et Lushin, 1954, (*Schizothorax pseudoaksaiensis issykkuli* Berg, 1907); *Diptychus dybowskii lansdelli* Gunter, 1889; , *Triplophysa trauchi ulacholicus* Ankin, 1905.

Schizothorax issykkuli, *Diptychus dybowskii lansdelli* are included in the Red Data Book of the Kyrgyz Republic

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).

Criterion 1. The Issyk-Kul Lake is an example of unique wetland for the biogeographic region in Central Asia. It is close to its natural state. Issyk-Kul Lake is the second largest lake among lakes of the world lying on the altitude of 1200 m above sea level, being slightly inferior to the area of Titicaca Lake. The Issyk-Kul Lake is of the greatest importance and considered to be a national treasure of the Kyrgyz Republic, which represents natural site of the world's significance with a set of historical and cultural monuments, and is under protection of the state. Its waters strike with clearness, transparency and healing features, attracting large number of tourists

Criterion 2. This area supports the existence of vulnerable, rare and endangered species of birds and fish, including endemics (fish)

English Name	Scientific Name	IUCN Status	CITES Status	CMS
White-headed Duck	<i>Oxyura leucocephala</i>	EN	II	I
Dalmatian Pelican	<i>Pelecanus crispus</i>	VU	App I	App I/II
Slender-billed Curlew	<i>Numenius tenuirostris</i>	CR	I	I / II

Criterion 3. This territory provides a habitat for wild animals, which are significant for supporting biodiversity of this region. The wetlands are characterized by a high level of endemic fishes. The total number of fish in the Issyk-Kul Lake is 28 of which 7 are endemics – Turkestan Gudgeon - *Gobio gobio lepidolaemus* Kessler 1872; Issyk-Kul Dace - *Leuciscus bergi* Kaschkarov, 1925; Schmidt's Dace - *Leuciscus schmidti* (Herzenstein, 1896); Issyk-Kul Minnow - *Phoxinus issykkulensis* Berg, 1912; Issyk-Kul Marinka - *Schizothorax issykkuli* Turdakov et Lushin, 1954, (*Schizothorax pseudoaksaiensis issykkuli* Berg, 1907); Issyk-Kul Scaleless Osman - *Diptychus dybomskii lansdelli* Gunter, 1889; , Issyk-Kul Stone Loanch *Triplophysa trauchi ulacholicus* Ankin, 1905.

Criterion 4. Issyk-Kul Lake is an important wintering and stopover site for birds, and in a lesser degree for nesting waterfowl. The total number of birds in the winter are 35-70 thousand, including Common Coot (*Fulica atra*), Red-crested Pochard (*Netta rufina*), Common Pochard (*Aythya ferina*), Black-necked Grebe (*Podiceps nigricollis*), Whooper Swan (*Cygnus cygnus*), Bewick's Swan (*Cygnus bewickii*), White-headed Duck (*Oxyura leucocephala*), Pygmy Cormorant (*Phalacrocorax pygmeus*), Great Black-headed Gull (*Larus ichthyaetus*), White-tailed Sea Eagle (*Haliaeetus albicilla*) are common species. About 50 species of waterfowl migrate through the Issyk-Kul Lake in the spring and fall. Northern Pintail (*Anas acuta*), Northern Shoveler (*Anas chryseus*), Greylag Goose (*Anser anser*), Demoiselle Crane (*Anthropoides virgo*), Temminck's Stint (*Calidris temminckii*), Dunlin (*Calidris alpina*), Ruff (*Philomachus pugnax*), Eurasian Curlew (*Numenius arquata*) Whimbrel (*Numenius phaeopus*) are numerous.

Criterion 5: During wintering there are approximately 35 to 70 thousand waterfowl and shorebirds.

Species		2009		2010		2011		2012	
English name	Scientific name	Migratory	Wintering	Migratory	Wintering	Migratory	Wintering	Migratory	Wintering
Great Crested Grebe	<i>Podiceps cristatus</i>	100	38	200	13	80	24	134	35
Black-necked Grebe	<i>Podiceps nigricollis</i>	813	1520	520	1123	874	1078	1000	1437
Great Egret	<i>Egretta alba</i>	43	12	34	41	23	37	90	20
Grey Heron	<i>Ardea cinerea</i>	242	-	163	12	146	25	60	3
Bean Goose	<i>Anser fabalis</i>	227	-	608	-	370	-	900	32
Mute Swan	<i>Cygnus olor</i>	485	1576	180	822	378	360	217	320
Whooper Swan	<i>Cygnus cygnus</i>	-	612	-	322	45	330	18	270
Ruddy Shelduck	<i>Tadorna ferruginea</i>	2027	1070	6784	76	1330	290	1700	450
Eurasian Wigeon	<i>Anas penelope</i>	835	-	620	-	1180	-	1150	-
Northern Pintail	<i>Anas acuta</i>	1250	-	1074	-	1330	-	720	-
Red-crested Pochard	<i>Netta rufina</i>	8125	9524	3178	8360	1237	8386	7332	4248
Common Pochard	<i>Aythya ferina</i>	6300	2854	170	1369	1515	392	2658	1483

Tufted Duck	<i>Aythya fuligula</i>	2455	1680	1575	952	1164	1243	1416	1224
Common Goldeneye	<i>Bucephala clangula</i>	-	480	--	1290	-	190	894	1013
Demoselle Crane	<i>Anthropoides virgo</i>	414	-	740	-	440	-	300	-
Common Coot	<i>Fulica atra</i>	53390	47470	56445	27693	30230	56400	87000	27900

Criterion 6: This wetland regularly supports 1% the following waterfowls and shorebirds. Thresholds for birds constitute is 1% of the world and biogeographic population.

№	Russian name	English name	Latin name	1% (WPE 2012)	Number per year			
					2009	2010	2011	2012
1	Черношейная поганка	Black-necked Grebe	<i>Podiceps nigricollis</i>	250	1520	1123	1078	1437
2	Лебедь кликун	Whooper Swan	<i>Cygnus cygnus</i>	200	612	322	330	270
3	Огарь	Ruddy Shelduck	<i>Tadorna ferruginea</i>	500	2027	6784	1330	1700
4	Красноносый нырок	Red-crested Pochard	<i>Netta rufina</i>	3200	9524	8360	8386	7332
5	Лебедь шипун	Mute Swan	<i>Cygnus olor</i>	250	1576	822	378	320
6	Лысуха	Eurasian Coot	<i>Fulica atra</i>	20,000	53387	56445	56400	87000

Criterion 7:

The wetland supports biological cycle development, life history stage and habitat of all endemic and native fishes. Some of them are good ecological indicators of the quality of the site.

There are 7 endemics – Turkestan Gudgeon - *Gobio gobio lepidolaemus* Kessler 1872; Issyk-Kul Dace - *Leuciscus bergi* Kaschkarov, 1925; Schmidt's Dace - *Leuciscus schmidti* (Herzenstein, 1896); Issyk-Kul Minnow - *Phoxinus issykkulensis* Berg, 1912; Issyk-Kul Marinka - *Schizothorax issykkuli* Turdakov et Lushin, 1954, (*Schizothorax pseudoaksaiensis issykkuli* Berg, 1907); Issyk-Kul Scaleless Osman - *Diptychus dybowskii lansdelli* Gunter, 1889; , Issyk-Kul Stone Loanch *Triplophysa trauchi ulacholicus* Ankin, 1905.

8 native species: *Diptychus gymnogaster microcephalus* Imanov, *Diptychus sewerzowi* Kessler, *Diptychus gymnogaster* Kesler, *Noemacheilus dorsalis dorsalis*, *Noemacheilus stoliczkai elegans*, *Noemacheilus trauchi dorsaloides*, *Emachilus stoliczkai* Steindachner, *Noemacheilus (Nemachilus) trauchi ulacholicus var.pedaschenko*

Issyk-Kul Marinka (*Schizothorax issykkuli*), Issyk-Kul Scaleless Osman (*Diptychus dybowskii lansdelli*, Issyk-Kul Stone Loach , *Noemacheilus (Nemachilus) trauchi ulacholicus var.pedaschenko* are biological indicator fishes for Issyk-Kul Lake which can be sensitive to water quality. In addition to water quality is sensitive endemic species Schmidt's Dace (*Leuciscus schmidti* and Issyk-Kul Dace (*Leuciscus bergi*).

Criterion 9: This territory supports all fish species (native, endemic). It is important habitat, source of food and spawning ground.

28 of which 7 are endemics and not found away from Issy-Kul Lake. The endemic species are Turkestan Gudgeon - *Gobio gobio lepidolaemus* Kessler 1872; Issyk-Kul Dace - *Leuciscus bergi* Kaschkarov, 1925; Schmidt's Dace - *Leuciscus schmidti* (Herzenstein, 1896); Issyk-Kul Minnow - *Phoxinus issykkulensis* Berg, 1912; Issyk-Kul Marinka - *Schizothorax issykkuli* Turdakov et Lushin,

1954, (*Schizothorax pseudoaksaiensis issykkuli* Berg, 1907); Issyk-Kul Scaleless Osman - *Diptychus dybowskii lansdelli* Gunter, 1889; , Issyk-Kul Stone Loanch *Triplophysa strauchi ulacholicus* Ankin, 1905.

)/ Issyk-Kul lake supports 100% of the population of these species.). There are also eight native species: *Diptychus gymnogaster microcephalus* Imanov, *Diptychus sewerzowi* Kessler, *Diptychus gymnogaster* Kesler, *Noemacheilus dorsalis dorsalis*, *Noemacheilus stoliczkaei elegans*, *Noemacheilus strauchi dorsaloides*, *Emachilus stoliczkaei* Steindachner, *Noemacheilus (Nemachilus) strauchi ulacholicus var. pedaschenko*

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:

Lake Issyk Kul - Upper Chu

b) biogeographic regionalisation scheme (include reference citation):

Freshwater Ecoregions of the World (Robin Abell et al. 2008)

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.

Issyk-Kul Lake is of a tectonic origin, formed as a result of fractures, break offs and surface deflections. An extensive part went down and filled with water while adjacent areas rose to 3000-3500 m above the lake and have formed ridges of the Teskey Ala-Too in the south and the Kungey Ala-Too in the north of the lake. Isolated uplands Chaarzhoon (2722m) and the Ala-Bel close the the valley in the East and, the Kara-Koo and the Kyzyl-Ompol. Mountainous rim of Issyk-Kul ends in the west by a narrow Boom gorge through which Chu River flows. Chu River is only 4 km away from the Issyk-Kul Lake. The lake's length is 180 km, the maximum width is 60 km, average depth is 280 m, maximum is 668 m, and the area of 6236 km². Depths of 100 meters are mostly assimilated by living organisms, comprise about 38% of the landscape. The volume of water is 1738 km³, length of a coastline is 688 km. The water level fluctuates depending on seasons. Rise of the water level reaches 21-22 cm in average during the period of spring and summer heavy water entrance due to snow and glacier waters, and decreases in the period of autumn and winter.

Issyk-Kul Lake basin may be classified as oligotrophic basin because of the great depths, weak irregularity of the coastline, climatic originality and hydrologic conditions. Thus, phytoplankton production does not exceed 488 mg / m³, zooplankton - 910 mg/m³, zoobentosa-10g/m².

Issyk-Kul Lake has no outlets, therefore, the water is salty but, salinity is small 5,968 g/l and it is 5.5 times less than salinity of the seawater. The lake has a chloride-sulphate-sodium-magnesium type of mineralization. Insignificant rate of the total mineral content of water indicates that the Issyk-Kul Lake as a drainless basin is of a young age.

The water is characterized by a rich content of dissolved oxygen, differs by high transparency, which is explained by the weak development of organic life and water salinity, promoting coagulation of colored organic substances. Waters of the Issyk-Kul Lake are close to the sea and ocean water on transparency, and depending on the sun fall the lake's color changes from light blue to the dark blue color. The territory of the Issyk-Kul region can be divided into two hydrological areas according to a water balance: formation area and dispersal area of the flow. All syrt highlands to the south from the Teskey Ala-Too and flanks of ranges surrounding the Issyk-

Kul Lake up to the foothills serve as the area of formation, and only a narrow strip of coastal area of the Issyk-Kul belongs to the dispersion area of the flow. There are more than 400 rivers, creeks and streams in the territory of the basin. They belong to the basin of Naryn river, Tarim, Balkhash and undrained Issyk-Kul Lake system.

Issyk-Kul Lake is a unique basin, physical and geographical, climatic and hydrological characteristics distinguish it from other waters in arid areas. This mountain lake with basin has tectonic origin. It is in the mountains system of the Northern Tian-Shan, bordered with Kungey and Terskey Ala-Too. The lake's length is 180 km, the maximum width is 60 km, average depth is 280 m, maximum is 668 m, and the area of 6236 km². Depths of 100 meters are mostly assimilated by living organisms, comprise about 38% of the landscape. The volume of water is 1738 km³, length of a coastline is 688 km. The water level fluctuates depending on seasons. Rise of the water level reaches 21-22 cm in average during the period of spring and summer heavy water entrance due to snow and glacier waters, and decreases in the period of autumn and winter.

This is a lake without outlet, the Tup, Jergalan, Chon-Kyzyl-Suu Juuku, Barskoon rivers are the largest rivers which flow to the Lake from the eastern part of the lake.

Soil pH data for 2011

Points	pH
Petroleum station Balykchy city	8.27
Kagy-Sai village (field) North East	8.13
Tosor village (field) South	8.24
Tamga village (field) South	8.08
Barskoon village (field) South	8.28
Chong-Jargylchak village (field) South	8.51
Kichi-Jargylchak village (field) South	8.84
Darhan village (field) South	9.12
Ak-Terek village (field) South	8.84

The Issyk-Kul Lake shores' landscape is determined by a number of factors: geographical location and historical development of the natural complex, lake level fluctuation; orographic isolation, climate change from west to east (E. Azykova, A. Melnikova, 1979).

There is swampy meadow soil type on the Issyk-Kul Lake shore; it is directly near northern gray and light-brown soil. They might be in a complex with meadow soil or spot. Groundwater moistures not only lower, but the upper horizons. Therefore some soil types usually have strong salinity.

Peat soils are mostly located on the northern coast of Issyk-Kul Lake. Especially they are widely distributed in Semyonovka, Ananjevo Chon Uryukty and Kichi-Uryukty.

Issyk-Kul Lake basin is 22 080 km², of which the water is 6 236 km², the rest part are foothill plain, middle and high mountain areas, where forms runoff. Water flows to the lake mainly from the rivers in addition there is a large spring-summer run, which is determined by snow reserves in the basin. The main power of the river, and lake is derived from the alpine zone from glaciers.

The main area of glaciers located on the northern slopes of Terskey Ala-Too, there are 675 glaciers with a total area 510.1 km². Kungei Ala-Too mountain range has smaller scale glaciations, total number of glaciers is 159, with area of 140.3 km². Winter precipitation plays important role in the river flows of the valley, where the incoming part in the water balance of the lake is about 70%.

In the Issyk-Kul basin snow cover has a very distinct latitudinal change. In the west, it is extremely dry, there is almost no snow in Balykchy. In the middle part of the valley the snow depth is 3-5cm. (Cholpon-Ata) and relatively stable during December-February. There is deep

snow (35-40 cm) sometimes up to 50 cm in the East of the Issyk-Kul. In the San-Tash and Jergalan snow cover is up to 1m.

The lake raises the air temperature up to about 10°C in January and makes summers indulgent, which is unusual for the Central Asian climate. The average temperature is 16,5-16,9°C in July and August in Karakol (1774 m.), 13,9 -14,2 °C in Dzhetyoguz (2300 m.), 9,5 - 9,7 °C in Chon-Kyzylsuu Gorge and in the area of Physical-Geographical Station (2555 m.), , 6-6,2 °C in the Highlands at the snout of Karabatkak glacier (3250 m).

Cloudless weather is dominated in the Issyk-Kul due to the indulgent summer. Sun shines for 300-320 hours or 67% or 70% in June and August in Karakol but, in mid-mountain - in Chon Kyzylsuu (2555 m) for 190-240 hours. Intensive solar radiation is determined by the high solstice: 70-72° during the summer and 23° during the winter solstice. Warm and dry west wind coming through Boom Gorge (locally named "Ulan" and "Boom") (60%) dominates in the "Issyk-Kel" Biosphere Territory. Sometimes the cold east wind "Santash" meets with the western wind and causes waterspouts. Coastal winds - breezes are common in Issyk-Kul region, which blow from the lake to the shore in day-time (local name - "sea wind"), and from the shore to the lake at night time - ("Hilly"). Wind direction in the gorges is the same.

Precipitation on the mountains of the Central Asia is considerably linked with the western winds. It is amazing that air currents occurring in the Atlantic Ocean passing through thousands of miles and parching deserts of the Central Asia bring the ocean humidity to Tien-Shan and considerably define the weather character on the Tien-Shan mountains. The air passing through the Boom Gorge is expanded and drained in the Issyk-Kul Basin. Air masses are saturated with humidity of evaporations of the lake passing the surface of the Issyk-Kul Lake and create precipitations, which are essential to a warm season when they fall to the eastern part that is favorable for humidity condensation. Due to these characteristics the precipitation in the basin increases from west to east: 115 mm per year in the western part (Balykchy), 200-250 mm in the middle (Bokonbaevskoe, Cholpon-Ata), 415 mm in the eastern part (Karakol), and 570-676 mm near the Kungei Ala-Too (Kurmenty, Tup).

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 environmental systems of the Issyk-Kul basin is different from other regions of the Tian-Shan by its physical geography, climate and hydrological condition. The orographic isolation and the presence of a large ice free, deep basin creates the climate and determines the nature of the processes taking place in the region. The lake basin is a vast hollow oval form, elongated in the latitudinal direction.

The Issyk-Kul basin climate is very peculiar, local winds "Ulan" play a very important role for climate formation, blowing from the west of the Boom Gorge and wind "Santas" blowing from the east of the valley of the same name. West wind forcefully different, the largest of its speed reaches 40 m / sec. The wind increases annual precipitation from west to east: the amount of rainfall has a direct impact on coastal vegetation, which is an extremely diverse and mosaic made up of different kinds of ecotypes.

The Issyk-Kul basin vegetation is formed under the influence of several ecological factors.

- the altitude (1600-1700 m). Group of fescue, mat-grass, areas with coastal sage groups-tarragon.
- the impact of Issyk-Kul Lake. Wetlands with bog-meadow and tugai, saline area with typical habitats of flora.
- the anthropogenic impact. Areas with agricultural crops, gardens, artificial planting poplar, elm, and other plants.
- the wind impact. It is mainly expressed in the western coastal area, where there are large gravel areas, often deprived from any vegetation.

There are five natural systems within holocene terraces of the region (Azykova, Melnikov, 1979).

- sandy beaches, which include the surf zone and facing the lake is free of vegetation of the coastal slope of the shaft, which has almost disappeared due to water level increasing in the lake;
- sandy and sandy beach ridges, covered with thickets of sea buckthorn;
- ancient lagoon, which are reed marshes;
- granulated reed-sedge and grass-sedge meadows;
- ancient sand ridges.

18. Hydrological values:

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

Cultural value, Habitat for fish

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.

- Q

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.

According to E.Azykovoy A. Melnikova (1979) natural ecosystems of the coastal zone of Issyk-Kul Lake are : shrubs 2627.6 ha; wetland and waterlogged 805.3 hectares, saline areas of western and eastern zones of 3382.9 hectares, i.e the coastal band is 6815.8 hectares.

The number of water birds in the Issyk-Kul Lake depends mainly on the food, freezing shallows.

The most favorable area for wintering birds in the mild winters is the western zone (from p.

Toru-Aigyr the northern shore of the Ak-Bulun peninsula along the south shore) – where more than 50% of wintering birds are found , in the eastern zone (from Kyzylsu village on south shore up to Kuturgu village on the north shore) - up to 30-40%, and then in small northern bays up to 15-20%, on the southern part about 5-10% as shallow water is small.

In severe winters bird distribution is slightly varied and the number of birds in the northern and southern coasts increases due to the shallow freezing in the western and eastern areas.

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.*

Flora of Issyk - Kul Reserve relatively not rich, as it includes mostly coastal areas of Issyk - Kul Lake. The most part of the flora are widespread species.

The highest concentration of plant species is found in the "Prishib" north part of the Issyk – Kul Reserve. There are *Scutellaria przewalskii* Juz. and *Tulipa tetraphylla* Regel - endemic species for the Inner Tian-Shan in the Ramsar site, The last one is included in the Red Data Book of the Kyrgyz Republic.

There is unique biotic association of the special type of wet meadows in the Eastern and ephedra associations in the North West part of the Ramsar Site.

Coastal and aquatic vegetation are an essential part of territory. Coastal vegetation in the northern, eastern and south-eastern zone consists of various kinds of willows, sea buckthorn and reed beds. For the western and north-western zone is characterized by halophytes, halimodendron, wormwood-tarragon, ephedra. In the thickets of coastal aquatic vegetation of reed, cattail and bulrush waterfowls nesting.

Green algae, water spike, pondweed and comb, urrutia spiked and other are important food for waterfowl in winter. Musk grass plays significant role in form water vegetation in the Issyk-Kul Lake. They rank first both on the area of overgrowth, and form phytomass.

The small slope of the bottom, black muddy bottoms, and great transparency of water is ideal for musk grass (Charophyta) in the bays. Phytomass is between 20 and 60 kg/ m².

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.*

The Issyk-Kul Lake is the habitat of 8 native and 7 endemic species of fish. The entomofauna has not been fully inventoried in this area. According to the data of researchers there is very unique biotic association in the special type of wet meadows in the Eastern and ephedra associations in the North West part of the Ramsar Site.

In addition the wetland provides a habitat for many rare species, some of them inhabit protected wetlands: Central Asian Frog (*Rana asiatica*), Toad Pewzow's (*Bufo pewzowi*), from Mammals (*Meriones libycus*). Marsch Frog (*Rana ridibunda*), Muskrat (*Ondatra zibethicus*), Badger (*Meles leucurus*), Fox (*Vulpes vulpes*), Golden Jackal (*Vulpes aureus*) are usual species.

The lake has 13 introduced species of fish : *Cyprinus caprio* Linnaeus, *Carassius auratus*, *Ctenopharyngodon idella*, *Abramis brama* Linnaeus Orientalis, *Hypophthalmichthys molitrix*, *Pseudorasbora parva*, *Oncorhynchus mykiss*, *Salmo ischchan isykogegarkuni* Lushin, *Coregonus Lavaretus* Ludoga Poliakov, *Coregonus autumnalis* (Pallas, 1776), *Coregonus peled*, *Lucioperca Stizostedion*, *Hupseleotris cinctus*

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 seashore and lake is important for local people. It has spiritual meaning and cultural heritage for local people. It has therapeutic for some skin diseases, asthma. Lake water except for areas inside Issyk-Kul Reserve is used for amateur fishery, shipping, cargo carried from the ports of Balykchy city, Karakol city, Pokrovka city etc.

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:

24. Land tenure/ownership:

a) within the Ramsar site:
State ownership.

b) in the surrounding area:

The surrounding areas except the land area of the Issyk-Kul Nature Reserve – is private, state (public) and municipal land ownership.

25. Current land (including water) use:

a) within the Ramsar site:

Fishing, fish capture and breeding, grazing, shipping, recreation and entertainment

b) in the surroundings/catchment:

livestock farming, hunting.

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 the past reduction of the lake level it might be because of the unsustainable use of the rivers for agriculture, or natural condition and pollution with fertilizers and chemicals from nearby agriculture fields were a negative factor .

At present the main negative factor is the incompetence of the water treatment facilities with regulations and standards; increase of health resorts numbers as well as illegal fishing and illegal hunting of some small mammals badgers, muskrats and rabbits and birds.

There are also 13 introduced fish species.

Wastewater treatment plants in big cities (Balykchy, Karakol and Cholpon-Ata) are close to the shoreline, treated waste water may flow into the lake, and can affect the quality of the water.

Not all wastewater treatment plants do not meet the standards, equipment for biological treatment (radial pits, installing anaerobic) is old. Biological treatments are in ponds with aeration and solar radiation.

In Balykchy there are 6 biological ponds for waste water, treated water is used for agricultural field. In Cholpon-Ata there are 6 pond-sumps, treated water is used for agricultural field. In the city of Karakol there are stations, biological ponds, dams. Drained through the dam water fall into wetland from which further flows into the local river.

Exceeding on oil and ammonium nitrogen shows pollution these places

b) in the surrounding area:

In the neighborhood coast, coastal vegetation burning, hunting, irregular grazing.

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.

In 1998 the Issyk-Kul Biosphere Territory (administrative body of the Issyk-Kul region) was established. The Issyk-Kul State Nature Reserve has become core zone of the Biosphere Territory.

In 2001 Issyk-Kul Biosphere Territory was included in the World Network Of Biosphere Reserves based on the decision of the MAB by UNESCO.

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?

There is no special management plan. There is an annual work plan and general land inventory plan which is updated every 10 years.

d) Describe any other current management practices:

There are projects for the restoration of the number of native fish species regulated by quotas on natural resources (fishing, hunting). The reserve staff carries out the nature records, and monitor the waterfowl and patrol.

28. Conservation measures proposed but not yet implemented:

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

The Law on Moratorium on fishing and cage culture fishery and breeding farms for coast Rainbow trout (*Salmo gairdneri*) is proposed by the State Agency on Environment Protection. Now it is on consideration of the Parliament of the Kyrgyz Republic.

There is amendment to Law of the Kyrgyz Republic "About Ecological and Economical System of the Issyk-Kul" to prohibit economic and other activities that destroys the development of natural processes or has harmful effects to natural complexes, in particular:

chemical pollution of Issyk-Kul Lake, as well as the drainage area from discharge and emission of harmful substances, pesticides, agricultural chemicals, radioactive substances, transportation,

including watercraft with two-stroke outboard engines and placement and movement of waste production and consumption, as well as discharge of domestic and industrial waste water into the lake and the rivers that flow into it.

29. Current scientific research and facilities:

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

There is Research Department in the the Issyk-Kul reserve which is 6 persons. Representatives from nature protection organizations, research institutions can be involved during field work.

There are several research topics for long term monitoring conducted by Issyk-Kul reserve:

- Phenological monitoring for higher plants (tree, brushwood, medicinal herb, mushroom) for species diversity.
- Eco demographic monitoring of waterfowl;
- Mammals;
- Climate and temperature.

The Issyk-Kul reserve staff carry out regular monitoring on population wintering waterfowl and shorebirds. In addition there are regular meteorological observations at meteorological stations. Periodically, special studies are conducted jointly with other research institution.

There is project on increasing the number of native fish.

Biosphere Territory “Issyk-Kul” monitors water, soil quality, involved in seasonal bird counting, patrol. The last two years Biosphere Territory “Issyk-Kul” established a special building for endemic fish breeding. Now they are breeding Issyk-Kul Marinka (*Schizothorax issykeuli*) and releasing the lake to restore and maintain number of this fish.

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.

There is an ecological center in Cholpon-Ata, museum “Nature” in Issyk-Kul Reserve, museum “Prijevalsk” in Karakol city and other objects on social and cultural spheres. Biosphere Territory “Issyk-Kul” publishes a quarterly newspaper "Ak-Kuu" with 3 thousand copies and distributes it free of charge to all the districts and cities of the region. Various booklets on environmental topics, nature protection are regularly published and distributed. Different kinds of tours, seminars and conferences on the conservation of the unique Issyk-Kul Lake are conducted.

31. Current recreation and tourism:

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

Coast of the Issyk-Kul Lake is widely used as a recreational complex. Hotels and resorts are mostly located in the north-west, and in the southern part of the lake.

Annually more than 1 mln. tourists visit this place, out of the about 500 000 people national and foreign: 1 030 000 - 1 040 000 mostly tourists from Russia and neighboring countries for example in 2010 – 400 000 (data according to the local administrations);

2011 – 2 300 000 (according to the Ministry of Economic Regulation);

2012 – 1 104 100 (according to the data of the Department of Tourism of the Ministry of Culture and Tourism of the Kyrgyz Republic).

32. Jurisdiction:

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

Kyrgyzstan, Issyk-Kul region, The State Agency on Environment Protection and Forestry of the Government of the Kyrgyz Republic.

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.

The State Agency on Environment Protection and Forestry of the Government of the Kyrgyz Republic.

The Biosphere Territory "Issyk-Kel", the Issyk-Kul State Nature Reserve.

Name of director of Issyk-Kul State Nature Reserve: Alik ESENALIEV.

Address: Street: Lenin str., 96, City, Postal Code: Ananevo, 722324, Issyk-Kul region, Issyk-Kul oblast, the Kyrgyz Republic, office tel/fax: +996 3943 72099

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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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Appendix 1: Water quality table

Below table shows water quality the last 5 years from different checking points.

Location	data	2007	2008	2009	2011	2012	Maximum concentration limitation for fisheries management
Petroleum station Balykchy city	pH	8.67	9.2	8.45	8.39	8.56	6.5-8.5
	Biochemical oxygen demand 5	1.66	2.13	2.12	0.83		3.00
	Dissolved oxygen	8.17	9.02	8.54	8.11		Not less than 6.0
	Ammonium nitrogen	<0.05	<0.05	<0.05	<0.039	<0.039	0.39
	Nitrite	<0.01			<0.01	<0.01	0.024
	Nitrate	0.05	7.6	8.2	<0.1	0.50	9.0
	Phosphorus P 5	<0.005			<0.02		
	Ferrum Fe		0.345	1.05	<0.05		
	Calcium Ca		106.8	100.6			
	Magnesium Mg		341.5	333.1			
	Natrium Na		1807.9	1630.3			
	Calium K		92.5	75.8			
	Cuprum Cu				<0.0006	<0.0006	0.001
	Zinetum Zn				<0.0005	<0.0005	0.01
	Chrome Cr		<0.007	<0.007	<0.02		
	Marganese Mn		0.006	0.008			
	Cadmium Cd				<0.0002	<0.0002	0.005
	Lead Pb				<0.0002	<0.0002	0.006
	Nickel Ni				<0.01		
	Chloride				1829		300
	Sulfate				973		100
	synthetic surface-active substance	0.02			<0.01	<0.01	0.10
	Petroleum products	<0.02			0.05	<0.05	0.05
Shiprepairing Plant, Balykchy city	pH	8.67	9.1	8.54	8.42	8.56	6.5-8.5

	Biochemical oxygen demand 5	0.57	1.85	1.69	0.32		3.00
	Dissolved oxygen	8.04	8.54	8.47	9.10		Not less than 6.0
	Ammonium nitrogen	1.02	0.2	0.2	0.20	<0.039	0.39
	Nitrite	0.032			0.01	<0.01	0.024
	Nitrate	0.48	8.8	8.8	0.90	0.60	9.0
	P	0.006					
	Fe		0.054	0.184	<0.05		
	Cd		105.9	105.9			
	Mg		340.9	329.6			
	Na		1847	1640			
	K		85.6	76.9			
	Cu				<0.0006	<0.0006	0.001
	Zn				<0.0005	<0.0005	0.01
	Cr		<0.007	<0.007	<0.02		
	Mn		<0.003	<0.003			
	Cd				<0.0002	<0.0002	0.005
	Pb				<0.0002	<0.0002	0.006
	Ni				<0.01		
	Chloride				1772		300
	Sulfate				985		100
	synthetic surface-active substance	<0.02			<0.01	<0.01	0.10
	Petroleum products	<0.02			0.07	<0.05	0.05
Yacht Club "Cruise" Cholpon-Ata City (North)	pH	8.55	9.2	8.5	8.37	8.53	6.5-8.5
	Biochemical oxygen demand 5	0.67	2.41	2.65	0.79		3.00
	Растворенный кислород	9.26	9.28	9.69	7.60		Not less than 6.0
	Ammonium nitrogen	<0.05	<0.05	<0.05	<0.039	<0.039	0.39
	Nitrite	<0.01			<0.01	<0.01	0.024
	Nitrate	<0.08	7.7	1.5	<0.1	0.70	9.0
	P	<0.005					
	Fe		<0.006	<0.006	<0.05		
	Ca		111.7	111.7			

	Mg		414.8	414.8			
	Na		2324.9	1516.7			
	K		105.8	105.8			
	Cu				<0.0006	<0.0006	0.001
	Zn				<0.0005	<0.0005	0.01
	Cr		<0.007	<0.007	<0.02		
	Mn		<0.003	<0.003			
	Cd				<0.0002	<0.0002	0.005
	Pb				<0.0002	<0.0002	0.006
	Ni				<0.01		
	Chloride		1629	1495	1574		300
	Sulfate		1987.8	1911	1181		100
	synthetic surface-active substance	<0.02			<0.01	<0.01	0.10
	Petroleum products	<0.02			0.06	0.11	0.05
Plant “Ulan” Karakol city (North)	pH	8.5	9.0	8.7	8.39		6.5-8.5
	Biochemical oxygen demand 5	0.99	2.47	3.2	0.22		3.00
	Dissolved oxygen	7.17	9.29	10.12	7.78		Not less than 6.0
	Ammonium nitrogen	<0.05	0.06	0.05	<0.039		0.39
	Nitrite	<0.01			<0.01		0.024
	Nitrate	0.05	8.4	0.5	<0.1		9.0
	P	<0.005					
	Fe		0.594	0.032	<0.05		
	Ca		110.5	121.3			
	Mg		407.5	345.6			
	Na		2366.9	1784			
	K			85.6			
	Cu				<0.0006		0.001
	Zn				<0.0005		0.01
	Cr		<0.007	<0.007	<0.02		
	Mn		0.005	0.008			
	Ca				<0.0002		0.005
	Pb				<0.0002		0.006
	Ni				<0.01		
	Chloride		1553	1456.2	1489		300
	Sulfate		1926.8	1884.7	1164		100
	synthetic surface-active substance	0.02			<0.01		0.10
	Petroleum	<0.02			<0.04		0.05

	products						
Kagy-Sai village Beach resort "Salim" (South)	pH		9.0	8.41	8.25	8.49	6.5-8.5
	Biochemical oxygen demand 5		2.20	1.00	0.69		3.00
	Dissolved oxygen		9.43	7.54	9.30		Not less than 6.0
	Ammonium nitrogen		<0.05	<0.05	<0.039	<0.039	0.39
	Nitrite				<0.01	<0.01	0.024
	Nitrate		3.2	1.5	<0.1	0.60	9.0
	P						
	Fe		0.087	0.01	<0.05		
	Ca		113.7	121			
	Mg		317.5	308.2			
	Na		1745.9	1475.5			
	K		78.0	72.6			
	Cu				<0.0006	<0.0006	0.001
	Zn				<0.0005	<0.0005	0.01
	Cr		<0.007	<0.007	<0.02		
	Mn		0.003	<0.003			
	Cd				<0.0002	<0.0002	0.005
	Pb				<0.0002	<0.0002	0.006
	Ni				<0.01		
	Chloride		1577	1394	1616		300
	Sulfate		1973.1	1797	950		100
	synthetic surface-active substance				<0.01	<0.01	0.10
	Petroleum products				<0.04	<0.05	0.05
Tong Beach (South)	pH	8.61	9.0	8.63	8.36		6.5-8.5
	Biochemical oxygen demand 5	0.77	2.66	1.1	0.67		3.00
	Dissolved oxygen	8.25	9.54	8.04	8.61		Not less than 6.0
	Ammonium nitrogen	<0.05	<0.05	<0.05	0.039		0.39
	Nitrite	<0.01			<0.01		0.024
	Nitrate	0.04	6.0	1.5	<0.1		9.0
	P	0.018					
	Fe		0.086	0.087	<0.05		
	Ca		100.7	112			
	Mg		211.0	212.3			
	Na		1153.9	1113.5			
	K		50.1	54.6			

	Cu				<0.0006		0.001
	Zn				<0.0005		0.01
	Cr		<0.007	<0.007	<0.02		
	Mn		0.005	0.008			
	Cd				<0.0002		0.005
	Pb				<0.0002		0.006
	Ni				<0.01		
	Chloride		1053	1000.8	1560		300
	Sulfate		1336.6	1342.3	985		100
	synthetic surface-active substance	0.02			<0.01		0.10
	Petroleum products	<0.02			<0.04		0.05

Note:

The high content of sulphate and chloride is natural characteristics of Issyk-Kul Lake. Lake water sampled from the South of Issyk-Kul Lake, less mineralized than the water along the North coast. Sodium (Na), potassium (kalium K), magnesium (Mg), chlorides and sulfates (major macro-components) in the northern shore waters of the lake are on average two times higher than in the south coast waters. The ratio of anions and cations (% equivalent), i.e. internal chemicals in water, selected from different points is almost the same. The difference of salt (mg / L) in the water is probably because of the heavy river water flow from the South. The rivers which flow to the lake is classified as a calcium sulphate-carbonate.

High content of iron is probably associated with the iron cations in rivers.