# Update of the information on the status of wetlands in Kazakhstan, Kyrgyzstan, and Turkmenistan by collection and dissemination of good practices for conservation and sustainable use of wetlands by local communities

*Under the editorship of Professor E.A. Rustamov*

Проект финансирован Правительством Японии

This publication has been made possible thanks to the implementation of the project **"Update of the information on the status of the wetlands in Kazakhstan, Kyrgyzstan and Turkmenistan by collection and dissemination of good practices for conservation and sustainable use of wetlands by the local communities",** supported by the Ramsar Convention Secretariat and funded by a voluntary contribution of the Government of Japan.

| | |
|---|---|
| **Authors** | A.T. Davletbakov, A.M. Kozybakov, E.A. Rustamov, Z. Karina |
| **Translation into English** | A. Khlebnikov |
| **Corrector** | N. Kumambetova |

**Correct reference** E.A. Rustamov (editor). Update of the information on the status of the wetlands in Kazakhstan, Kyrgyzstan and Turkmenistan by collection and dissemination of good practices for conservation and sustainable use of wetlands by local communities. Almaty, 2018.

# Contents

# Summary

This publication is prepared to provide the relevant users with the information on the positive experience in the Ramsar Sites conservation and management practices in the countries of Central Asia (Kazakhstan, Kyrgyzstan, Turkmenistan).

The methods of collecting and analyzing materials, including obtaining the information from the local population, are described. The general information on the wetlands in Central Asia and the implementation of the Ramsar Convention is presented along with the practices of wetland conservation and management in each mentioned country. Particular attention is paid to ecosystem services and benefits.

The main part represents a review of the existing Ramsar Convention guidelines in the field of wetland management and conservation by the local communities. It consists of essays on the wetlands in three countries (Kazakhstan, Kyrgyzstan and Turkmenistan), where best practices of management and conservation are implemented. The document provides an analysis of the management plans, developed earlier for the Ramsar Sites in each of the above countries, highlighting their positive aspects, and presents views of the local communities as the main users of these water resources.

Short recommendations are presented for wetland conservation and development of the best available practices for sustainable use of wetlands in Central Asia. In particular, it is recommended to delineate more precisely the borders of wetlands, to expand the network of specially protected natural territories, to provide ecological corridors for migration and stopover of wetland birds, to carry out long-term scientific researches and to pay special attention to the analysis of the archival data, to involve the local population in the tasks of conservation and sustainable use of wetlands, including the provision of new opportunities for the employment in the sphere of tourism, to spread the information on the importance of wetlands conservation in mass media and social networks, and to continue involving young people in the development of environmental projects on wetlands.

This publication is intended primarily for the local communities, using economic and environmental services of wetlands, and employees of the ministries and agencies related to water distribution and water utilization schemes of the relevant wetlands, primarily for those ones, which are not only of national, but also of international importance.

# Abbreviations

**ACBK** – Kazakhstan Association for Biodiversity Conservation
**BCFK –** The Biodiversity Conservation Fund of Kazakhstan
**CAREC –** The Regional Environmental Centre for Central Asia
**CC –** Coordination Committee
**COP –** Conference of the Contracting Parties
**EBSAs** – Ecologically or Biologically Significant Marine Areas
**EIA –** Environmental Impact Assessments
**GEF –** Global Environment Facility
**GIZ** – Германское общество по международному сотрудничеству
**IBA** – Important Bird Areas
**ICSD –** Interstate Commission for Sustainable Development
**IFAS** – International Fund for Saving the Aral Sea
**IUCN –** International Union for Conservation of Nature
**IWC** - International Waterbird Census
**LLP –** limited liability partnership
**MP** – management plan
**NGO** – non-governmental organization
**RIS -** Ramsar Information Sheet
**RRI-CA** – Ramsar Regional Initiative of Central Asia
**SAEPF** – State Agency for Environmental Protection and Forestry
**SPNA** – Specially Protected Nature Areas
**UN**– the United Nations

# 1. Introduction

The role of wetlands in natural processes and in the life of communities is rather significant and diverse. Among the most important functions of wetlands are the following:

- *conservation of fresh water*
- *regulation of surface and subsurface run-off*
- *maintenance of the groundwater level*
- *natural water purification and retention of pollutants*
- *return of oxygen to the atmosphere, removal of carbon from the atmosphere and its accumulation*
- *climate stabilization, especially in relation to precipitation and temperature regime*
- *containment of shores from degradation and soils from erosion*
- *maintenance of biological diversity*
- *provision of habitats for plants and animals, including the threatened ones and/or those, which are of practical importance for humans*

In our arid region, Central Asia, wetlands are represented by rivers and canals, lakes and reservoirs, overflows and ponds, moistened and marshy lands. They all are indispensable water resources and biodiversity hotspots, connected to people's health and lives throughout the region. In our countries the human health and life itself depend on the purity and ecological state of wetlands.

At the same time, there are serious threats of anthropogenic character in the region, which lead to deterioration of the quality of wetland environment and degradation of wetland ecosystems: man-made pollution, unregulated water intake for agricultural needs, uncontrolled use of biological resources, change of natural flows and construction of dams, as well as transboundary issues of rational use of water resources.

## 1.1. The Ramsar Convention

The Ramsar Convention, which full name is “the Convention on Wetlands of International Importance, especially as the Waterfowl Habitat”, is the first global intergovernmental treaty on conservation and sustainable use of natural resources. Adopted in the Iranian city of Ramsar in 1971 and enacted in 1975, this Convention provides the basis for national action and international cooperation for the purpose of conservation and rational use of wetlands and their resources. The Convention represents the commitment of the Contracting Parties to ensure the wise use of all wetlands in their territory, to support the ecological character of wetlands of international importance and to cooperate with the neighboring countries to preserve transboundary wetlands and their biodiversity.

At present, 170 countries, including all countries of Central Asia, are Parties to the Convention. Its main, most known mechanism is the List of Wetlands of International Importance, or the Ramsar List. At present the Ramsar List includes 2,308 Ramsar Sites with a total area of 228,930,640 ha. In Central Asia, there are 21 Ramsar Sites, with a total area of 4.718,089 ha, of which 10 (3,188,557 ha) - in Kazakhstan, 3 (679,408 ha) – in Kyrgyzstan, 5 (94,600 ha) – in Tajikistan, 1 (267,124 ha) - in Turkmenistan and 2 (558,400 ha) – in Uzbekistan.

*The mission of the Convention is aimed at the achievement of the condition, when "wetlands are conserved, wisely used, restored and their benefits are recognized and valued by all".*

*This vision is presented in the Fourth Ramsar Strategic Plan for 2016-2024. The Plan includes four overall goals and 19 specific targets:*

***Goal 1:** addressing the drivers of wetland loss and degradation*

***Goal 2:** effectively conserving and managing the Ramsar Site network*

***Goal 3:** wisely using all wetlands*

***Goal 4:** enhancing implementation of the Ramsar Convention*

The United Nations Organization for Education, Science and Culture (UNESCO) serves as the Depositary of the Ramsar Convention. However, the Convention is not a part of the UN/UNESCO system of the environmental conventions and agreements. The Convention is subject only to the Conference of the Contracting Parties (COP), and the responsibility for the ongoing monitoring of its implementation is vested in the Convention Secretariat, which operates under the Standing Committee, elected by the COP.

The Secretariat of the Ramsar Convention is located in the office of the International Union for Conservation of Nature (IUCN), in the city of Gland, Switzerland. In each Contracting Party, there is a national focal point, that is, a representative, appointed by the country itself from among its citizens and specialists, through which the communication with the Secretariat is carried out.

All Central Asian states, including Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan, are the Parties to the Ramsar Convention. In November 2015 three of them (Kazakhstan, Kyrgyzstan and Turkmenistan) agreed with the official proposal of the Ramsar Convention Secretariat to establish the **Ramsar Regional Initiative for Central Asia (RRI-CA)** in order to strengthen regional cooperation for conservation and rational use of wetlands. Tajikistan and Uzbekistan expressed their desire to be involved in the work of the initiative with a possibility of their further official accession. The main provisions and principles of the RRI-CA activities were presented at the regular Meeting of the Interstate Commission on Sustainable Development of the International Fund for Saving the Aral Sea (ICSD IFAS) in Ashgabat, in May 2016. The Coordination Committee (CC RRI-CA) is the responsible body for taking decisions within the frames of the initiative, which includes the

most experienced experts – scientists and practitioners from Kazakhstan, Kyrgyzstan and Turkmenistan.

## 1.2. Objectives of the research

The project "Update of the information on the status of wetlands in Kazakhstan, Kyrgyzstan and Turkmenistan by collection and dissemination of good practices for conservation and sustainable use of wetlands by local communities" is the first project, proposed by the RRI-CA and approved by the Ramsar Convention Secretariat. Adylbek Kozybakov (Kazakhstan), Askar Davletbakov (Kyrgyzstan) and Eldar Rustamov (Turkmenistan) were selected on a competitive basis as national experts for the project implementation. The project was supported and implemented at the expense of a voluntary contribution from the Government of Japan.

The goal of the project was to collect, update, and disseminate the information on the good practices, which the local communities have in managing and sustaining the Ramsar Sites in Kazakhstan, Kyrgyzstan, and Turkmenistan.

***The project had the following objectives:***

- *To update the information on selected wetlands in Kazakhstan, Kyrgyzstan, and Turkmenistan*
- *To study awareness of the local communities of the value of wetlands and services they provide, and to conduct discussions in order to increase their awareness of the importance of wetlands*
- *To carry out large-scale events timed to the World Wetlands Day, involving the local population*
- ***To prepare the relevant guidelines on the best practices for the wetland conservation and management in Central Asia: Kazakhstan, Kyrgyzstan, and Turkmenistan, which present the final and main result of the project***

In the process of preparation of this publication, the main goals and objectives for informing all stakeholders of those wetlands, where on the positive practices for their management and conservation, were implemented. The information on the Central Asian region and its wetlands, implementation of the Ramsar Convention in the corresponding countries, and on the methodological approach for the project implementation was presented.

## 1.3. Methodology

The main principles of selection of wetlands for further analysis of their management were the following:

- *The wetland should be in the Ramsar List and it should already have a management plan.*
- *It should be a potential Ramsar area.*
- *The areas, where any corresponding international projects have been carried out.*
- *The areas, which management has already given some positive examples (even in case of unavailability of a management plan itself).*
- *The areas, where local communities have people (activists) carrying out the traditional methods of management.*

On this basis during the RRI-CA meeting in Almaty on May 11, 2017, the national focal points of the Ramsar Convention in the RRI-CA countries preliminarily proposed the wetlands for consideration by the CC RRI-CA, which were later approved on the operating level for studying their practices and management plans in the course of the project implementation.

Ten wetlands were selected from all wetlands of the region for the purpose of studying practices and their management plans *(Table 1).* Among them, six wetlands are Ramsar Sites, and their management plans were assessed according to the five-point grading scale.

***In Kazakhstan:*** *1. Tengiz-Korgalzhyn Lake system; 2. Alakol-Sassykkol Lake system; 3. Lesser Aral Sea and Delta of the Syrdarya River; as well as – 4. Karakol Lake as a wetland, which has not been yet included in the Ramsar List*

***In Kyrgyzstan*** *these are the following Ramsar Sites: 1. Issyk-Kul Lake; 2. Song-Kul Lake; 3. Chatyr-Kul Lake*

***In Turkmenistan*** *these are the following wetlands: 1. Turkmenbashy Bay; and the potential Ramsar Sites: 2. Kurtli Lake; 3. Zeyit Reservoir named after the 15th anniversary of Independence of Turkmenistan with the Kelif Lakes*

The collection of the material was based on the route-field survey, during which visual examinations of the reservoirs, descriptions of the area and condition of the shores, registration of all types of wetland birds and other peculiar features were carried out. On the basis of this material is was possible to indirectly estimate a possibility of these wetlands to provide ecosystem services.
A polling survey was carried out among the local communities. The purpose of the survey was to find out how local people use the wetlands, what benefits they derive, what problems they have, and what wishes and suggestions they propose for overcoming these problems.

On the basis of the questionnaire survey *(see Attachment 1),* the awareness of the local communities of the value of wetlands, their understanding of the peculiarities of the environmental services and the importance of conservation and sustainable use of wetlands on which they live were identified. **A total of 505 people was interviewed, of which 77 on the wetlands in Kazakhstan, 240 in Kyrgyzstan, and 188 in Turkmenistan.**

***Table 1.*** *The wetlands examined under the project*

| Name | Date of registration: the Ramsar list and area | Coordinates | Administrative belonging | |
|---|---|---|---|---|
| | | | Protected area | Administrative territory (oblast or velayat, district or etrap) |
| Tengiz-Korgalzhyn Lake system | 11.10.1976<br>**353,341 ha** | 50°25′59″ N<br>69°11′20″ E | Korgalzhyn State Nature Reserve | Korgalzhyn district, Akmola oblast, Nurin district, Karaganda oblast |
| Alakol-Sassykkol Lake system | 25.11.2009<br>**914,663 ha** | 46°16′00″ N<br>81°32′00″ E | Alakol State Nature Reserve | Alakol district, Almaty oblast, Urdzhar district, East Kazakhstan oblast |
| Lesser Aral Sea and Delta of the Syrdarya River | 02.02.2012<br>**330,000 ha** | 46°20′50″ N<br>61°00′09″ E | Barsakelmes State Nature Reserve | Aral district, Kyzylorda oblast |
| Karakol Lake | **3,773 ha** | 43°53′44″ N<br>51°30′93″ E | Karakiya-Karakol Sanctuary of the Ustyurt State Nature Reserve | City of Aktau, Mangistau oblast |
| Issyk-Kul Lake | 26.12.1976<br>**624,439 ha** | 42°22'17″ N<br>77°21'58″ E | Issyk-Kul State Nature Reserve | Issyk-Kul, Jeti-Oguz, Tyup, Aksu districts, Issyk-Kul oblast |
| Son-Kul Lake | 23.01.2011<br>**38.869 ha** | 41°55'03″ N<br>75°08'32″ E | Karatal-Japyryk State Nature Reserve | Ak-Talaa district, Naryn oblast |
| Chatyr-Kul Lake | 08.11.2005<br>**16,100 ha** | 40°33'31″ N<br>75°09'03″ E | | Naryn district, Naryn oblast |
| Turkmenbashy Bay | 03.07.2009<br>**267,124 ha** | 39°47'47″ N<br>53°21'70″ E | Hazar State Nature Reserve | Turkmenbashy etrap, Balkan velayt |
| Kurtli Lake | **1,421 ha** | 38°01'00″ N<br>58°22'00″ E | - | Shakher Ashgabat |
| Zeiyt Reservoir named after the 15th anniversary of Independence of Turkmenistan and Kelif Lakes | **8,488 ha** | 37°31'00″ N<br>65°06'00″ E | Kelif Sanctuary of the Amu Darya State Reserve | Kerki and Halach etraps of the Lebap velayt |

## 1.4. General overview of wetlands of Central Asia

The sovereign states of Central Asia are the five countries: Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan. The total area of this territory is more than 4 million km$^2$. There are about 12 thousand large and small rivers in the region. Herewith, the catchments of more than 10 thousand rivers, including the main ones such as Amu Darya and Syr Darya, Ili and Irtysh Rivers, are located in the mountainous areas. The uneven distribution of the surface waters is stipulated by the peculiarities of the landscape and climate. The mountains are the area of collection and concentration of waters; the plains are the area of water discharge, including evaporation. This is the most important of the hydrological and economic characteristics of the region: alongside with the aridity of the Central Asian deserts, Tien Shan, Pamir and Turkmen-Khorasan mountain systems, adjoining the deserts from the south, are characterized by the presence of surface waters. Starting high in the mountains, many rivers have abundant nourishment due to the melting waters of high-mountain snows and glaciers. As rivers flow from the mountains to the plains, their waters are intensively used for irrigation, and many of them are completely exhausted, ending with irrigation fans. These are, for example, the Tejen, Murghab, Zeravshan, Kashkadarya, Chu, Talas rivers, and others.

The total number of lakes in the region is about 10 thousand. The region is characterized not only by a large number of water reservoirs, but also by their exceptional diversity. The largest of the natural lakes are the Caspian Sea, Balkhash Lake and Issyk-Kul Lake, and among the artificial ones are the Sarykamysh, Aydar-Kaynasar, Dengizkul and others. The average and small lakes are divided into four groups according to their natural conditions and geographical location: 1) plain lakes, 2) coastal lakes, 3) hillside lakes and 4) highland lakes.

The plain lakes are divided into: steppe and semi-desert, and loop lakes. The steppe and semi-desert lakes are widely spread in Kazakhstan. The basins are rather flat, saucer-like, with no clearly defined catchment areas. Most lakes represent the floods of steppe-rivers or temporary streams. The coastal lakes are basically represented by bays, which are separated from the sea and retain or lose the connection therewith. Some of them are relict lakes – the residual reservoirs of the Caspian Sea. Along its coast there are dry depressions, the bottom of which is located considerably below sea level. The most famous of them are the depressions at Mangyshlak: Batyr (-132 m), Kaundy (-55 m). The Kara-Bogaz-Gol Bay may also be referred to the group of coastal lakes. The hillside lakes are few in comparison with the plain lakes. Finally, the highland lakes are located, mainly, on the flat passes; they are, mainly, tectonic, having a rounded shape and insignificant sizes. Among the largest lakes of this group one can name Kara-Kul (at an altitude of 3954 m), Chatyr-Kul (3486 m) and Song-Kul (3047 m).

The water resources of Central Asia are environmental, economic and political factors influencing the region. Central Asian countries are characterized by disproportionate volumes of water consumption and require a regional approach to ensuring the safety of water resources. The situation is intensified by global climate change and is aggravated by slow transformation of the water management system, left as a legacy of the Soviet period, when water resources were used inefficiently.

## 1.5. Implementation of the Ramsar Convention provisions and management of the Ramsar Sites in the region

The Ramsar Convention does not require the Parties to create a body or a system of bodies for wetland management, giving the countries the right of determining conditions and means for fulfilling their obligations. In this connection, each of the Central Asian countries has developed its own practices for wetland management.

### *Kazakhstan*

Kazakhstan joined the Ramsar Convention on 2 May 2007 and has 10 Ramsar Sites at present *(Table 2).* Besides, five potential wetlands have been identified for the inclusion in the Ramsar List in the years 2018-2021.

The Laws of the Republic of Kazakhstan No. 593-II, dated July 9, 2004 "On Protection, Reproduction and Use of Wildlife", and No. 175-III, dated July 7, 2006 "On Specially Protected Natural Territories" were adopted in Kazakhstan, which included the legal norms and regulations of wetland issues (as amended of June 15, 2017); the rules for assigning reservoirs to wetlands of international and national importance were established (Decree of the Government of the Republic of Kazakhstan, No.18-03/94, dated February 11, 2015); the lists of the wetlands of International and Republican importance were approved (Order of the Ministry of Agriculture of the Republic of Kazakhstan No.18-03/369, dated April 24, 2015).

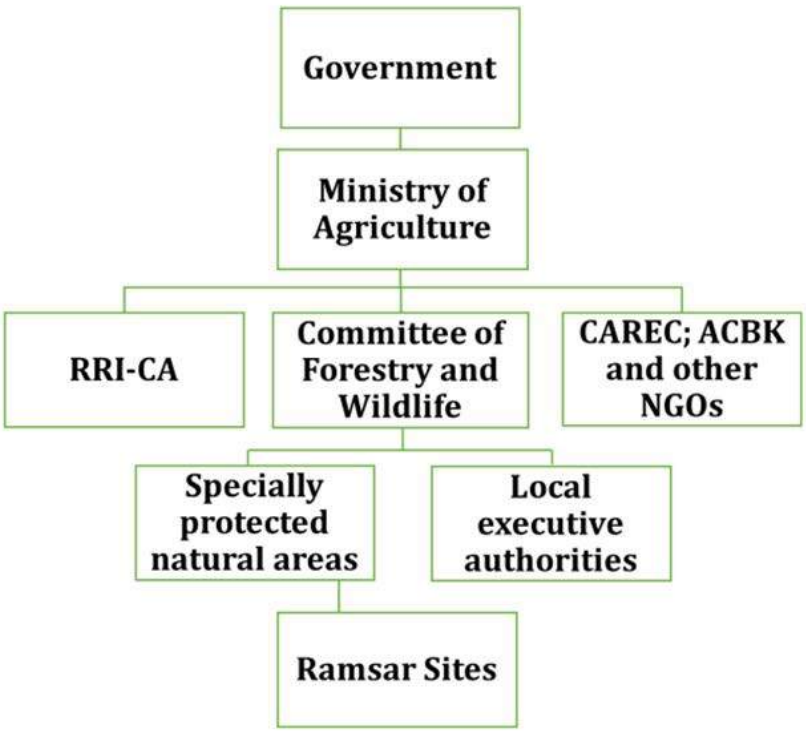


***Fig 1.*** *The management structure of the Ramsar Sites in Kazakhstan*

By Law of the Republic of Kazakhstan No.242-IV, dated January 21, 2010 "On amendments and additions to certain legislative acts of the Republic of Kazakhstan on flora and fauna", Article 39-1 "Wetlands. On the Regulation of the Wetlands" was added to the Law of the Republic of Kazakhstan No.593-II, dated July 9, 2004 "On Protection, Reproduction and Use of Wildlife".

Law of the Republic of Kazakhstan No.175-III, dated July 7, 2006 "On specially protected natural territories" was supplemented with the regulations for the Important Bird Areas (IBAs) (as amended of June 15, 2017): the habitats for a significant number of birds, rare and endangered species, bird communities, characteristic for certain landscapes, significant nesting or migration gatherings of land birds, waterfowl and semi-aquatic birds. In these territories, if they are not parts of the protected areas, a protection regime was established. Thus, in Kazakhstan, 121 IBAs are protected by the state.

***Table 2.*** *Ramsar Sites in Kazakhstan*

| Wetland name | Administrative territory (oblast, district) | Area, ha | Coordinates |
|---|---|---|---|
| Teniz-Korgalzhyn Lake system | Akmola oblast | 353 341 | 50°25'00''N 069°15'00''E |
| Alakol-Sassykkol Lake system | Almaty oblast, East Kazakhstan oblast | 914 663 | 46°16'00''N 81°32'00''E |
| Ili River Delta and the southern part of Balkhash Lake | Almaty oblast | 976 630 | 45°36' N 74°44' E |
| Lakes of the lower Turgay and Irgiz | Aktobe oblast | 348 000 | 48°42'00''N 062°11'00''E |
| Ural River Delta and adjacent Caspian Sea coast | Atyrau oblast | 111 500 | 46°58'00''N, 51°45'00''E |
| Zharsor-Urkash Lake system | Kostanay oblast | 41 250 | 51°22'00''N 62°48'00''E |
| Koibagar-Tyuntugur Lake system | Kostanay oblast | 58 000 | 52°39'00''N 65°45'00''E |
| Kulykol-Taldykol Lake system | Kostanay oblast | 8 300 | 51°23'00''N 61°52'00''E |
| Naurzum Lake system | Kostanay oblast | 139 714 | 51°32'00''N 64°26'00''E |
| Lesser Aral Sea and the Syr Darya River Delta | Kyzylorda oblast | 330 000 | 046°20'50"N 061°00'09"E |

All Ramsar Sites in Kazakhstan, in accordance with the current national legislation, in whole or in part are protected areas, and are influenced by the local authorities indirectly. To date, only Kulykol-Taldykol and Koibagar-Tyuntyugur Lake systems are not within a protected territory, but the work for their inclusion in the structure of the protected area has already

started. Lesser Aral Sea and the Delta of the Syr Darya River have not been yet transferred to the Barsakelmes state nature reserve.

Within the frames of the preparation of the State Programme for Water Resources Management in Kazakhstan, by the Protocol Resolution of the Prime Minister (Minutes of the Meeting No.11-5/07-168, dated July 2, 2013) it was commissioned to include the issues of water reservoirs, located in protected areas, including wetlands of international importance. It was also commissioned to determine the necessary actions for the wetland remediation.

### *Kyrgyzstan*

The Kyrgyz Republic joined the Ramsar Convention in accordance with the Law No.54, dated April 10, 2002 "On Accession to the UN Convention on Wetlands of International Importance, Especially as the Waterfowl Habitat, dated February 2, 1971". The State Agency for Environmental Protection and Forestry under the Government of the Kyrgyz Republic coordinates and ensures the fulfillment of the obligations, related to the implementation of the Ramsar Convention in the Republic. The activities aimed at studying and conserving the wetland complexes comprise development and implementation of the projects of the Agency and the National Academy of Sciences of the Kyrgyz Republic for the inventory of wetlands, elaboration of the standard provisions for the regime of use and protection of wetlands, their Management Plans, including the "Strategy for the Wetland Conservation in Kyrgyzstan (2013-2023)".

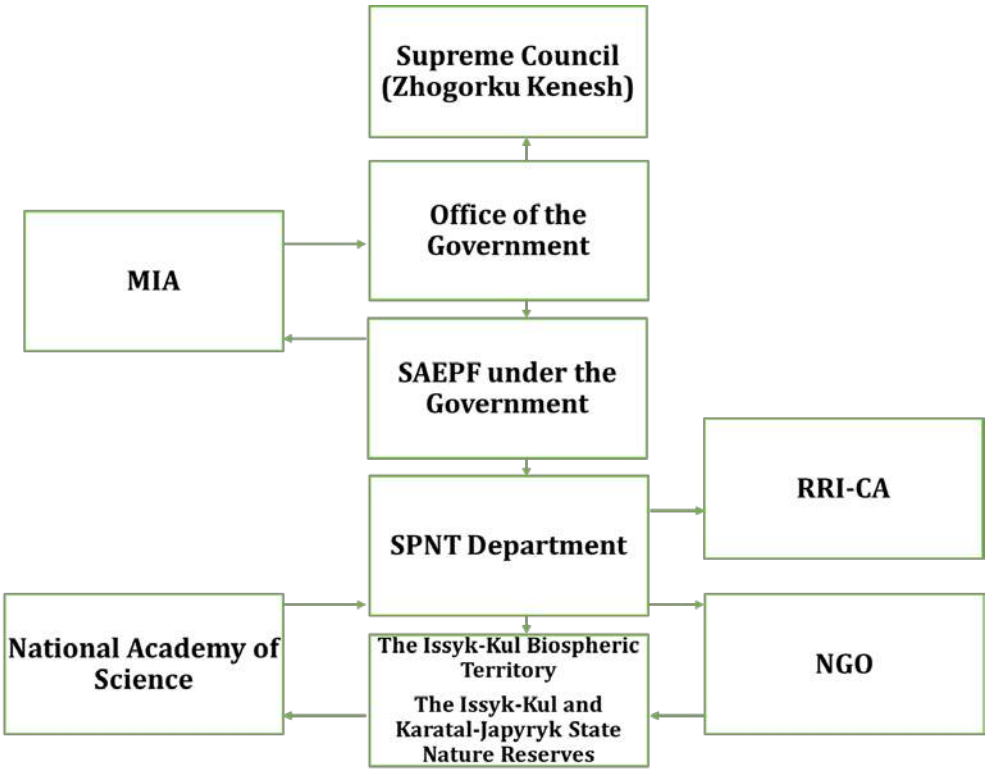


***Fig 2.*** *The management structure of the Ramsar Sites in Kyrgyzstan*

Upon fulfilling the obligations of Kyrgyzstan under the Ramsar Convention, a working group consisting of the representatives of the State Agency for Environmental Protection and Forestry and the national expert members of the RRI-CA Coordination Committee (B. Mamatayirov, R. Akulov, A.T. Davletbakov, A.N. Ostashchenko) selected the most promising wetlands for the inclusion in the Ramsar List: Chardaktusu, Kara-Suu and Sary-Chelek lakes, as well as the Orto-Tokoy and Toktogul reservoirs *(Table 3).*

The task of the working group includes studying these wetlands in order to develop management plans for their sustainable use and the basis for the conservation measures. Besides, the wintering of wetland birds is being monitored with the frames of IWC not only on the Ramsar Sites but also on the IBA. The above-mentioned experts, together with the staff of the protected areas, National Academy of Sciences and relevant hunting farms, monitor both the Ramsar and other wetlands in Kyrgyzstan.

***Table 3.*** *The wetlands in Kyrgyzstan, proposed for the inclusion in the Ramsar List*

| Wetland name | Coordinates | Area, ha | Administrative belonging |
|---|---|---|---|
| Chardaktusu | 41°46'50.20″ N.<br>76°44'10.36 ″E. | 2,600 | Naryn oblast, Kochkor district |
| Kara-Suu | 41°34'10.13″ N.<br>73°13'34.30 ″E. | 417 | Jalalabad oblast,<br>Toktogul district |
| Sary-Chelek | 41°52'26.23″ N.<br>71°58'32.32 ″E. | 486 | Jalalabad oblast, Aksy district |
| The average current of the floodplain of the Sussamyr River | 42°11'14.15″N.<br>73°45'53.14″E. | 3,100 | Chu oblast,<br>Zhaiyl district |
| Orto-Tokoy | 42°18'48.21″ N.<br>75°53'52.47 ″E. | 2,600 | Naryn oblast, Kochkor district |
| Toktogul | 41°47'32.62″ N.<br>73°07'25.69 ″E. | 28,400 | Jalalabad oblast,<br>Toktogul district |
| Kirov | 42°36'41.61″ N.<br>71°41'47.67 ″E. | 4,500 | Talas oblast, Kara-Buura district |

### *Turkmenistan*

Turkmenistan became a party to the Ramsar Convention in July 2009, and so far, nominated only one Ramsar area – the Turkmenbashy Bay. Nevertheless, as far back as 2010, under the State Commission for ensuring the implementation by Turkmenistan of its obligations resulting from the UN Conventions and Programs on the Environment, a Working Group was created for monitoring the implementation of the provisions of the Convention in the country and management of wetlands, existing and potential Ramsar Sites. The Working Group took part in the development of the RRI-CA.

The participation of Turkmenistan in the RRI-CA will help the State Committee for Environmental Protection and Land Resources in fulfilling the international obligations of Turkmenistan within the frames of the Ramsar Convention, as well as moving towards the

achievement of the following main objectives: to organize, as in the other countries, a network of the Ramsar Sites, to nominate in the Ramsar list such potential areas as Zeyit Reservoir named after the 15th anniversary of Independence of Turkmenistan and Kelif Lakes, Kurtli Lake as a city wetland, Ogurjaly Island together with South Cheleken and Turkmen Bays, Altyn-Assyr Lake of Turkmenistan, Sarykamysh Lake, Soltandag-Kyzylburun Lake system; and to continue the monitoring of wintering of wetland birds, including marine (EBSA/CBD) and territorial wetland sites, such as the Important Bird Areas (IBA).

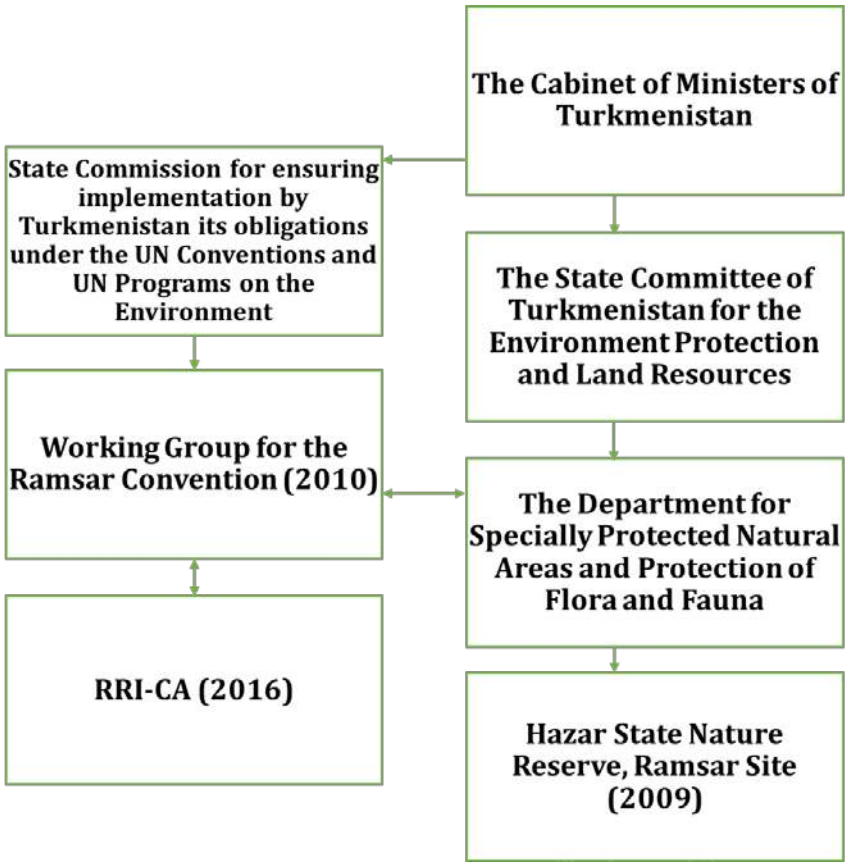


***Fig.3.*** *The management structure of the Ramsar Sites in Turkmenistan*

The experts of the Working Group (E.A. Rustamov, A. Veiyssov, Sh. Karryyeva), in accordance with the Ramsar Convention procedure, started preparing nominations (the RIS information document) for the Ogurjaly Island along with the South Cheleken and Turkmen Bays and have carried out, in accordance with the Working Plan, the monitoring of the wetlands not only of the nominated area (the Turkmenbashy Bay), but also of other wetlands. The main tasks facing the Working Group and the State Committee for the Protection of the Environment and Land Resources of Turkmenistan in the study and protection of the wetlands consist in carrying out their complete inventory, ensuring their legislative protection and elaborating the relevant Management Plans.

# 2. Guidelines and practices for wetland management in the region

## 2.1. General information on the guidelines for wetland management

The Ramsar Convention developed and adopted a number of documents, including Resolutions and Guidelines, which are aimed at providing scientific and methodological assistance in the implementation of its goals. They are intended for all organizations and individuals, which are interested in promoting the objectives of the Ramsar Convention – conservation and sustainable use of wetlands. Among them there are such documents the subject matter and tasks of which are close to the solutions our Guidelines are aimed at, specifically, practical solutions of the tasks of conservation and wise use of wetlands.

***That is why we draw attention to these three documents, which are most applicable to Central Asia:***

1. *Guidelines for integrating wetland conservation and wise use into river basin management, adopted by Resolution VII.18 (1999) of the Ramsar Convention*
2. *Issues for stakeholders to address in achieving sustainable tourism and recreation in and around wetlands (Resolution XI.7, annex 2, 2012)*
3. *Recommendations for carrying out the events devoted to the theme "Wetlands for sustainable future of the cities" (February 2, 2018)*

It is noteworthy that in all documents, first and foremost, a scientific approach should be applied to conservation and wise management of wetlands, including selection and operation the areas on the basis of an integrated watershed principle and an ecosystem approach, and taking into account the dependence of wetlands on the overall state of the watershed (if this is a river) to which it belongs, or, in general, on the global trends at the sea level. For example, the main scientific idea of the "Guidelines for integrating wetland conservation and wise use into river basin management" is based on the management and restoration of wetlands and their biodiversity on the basis of the basin approach. The Guidelines propose to involve all organizations, which are users of natural resources, in financing the works for conservation and remediation of wetlands through the mechanism of distributed costs. It is recommended to involve administrations, municipalities, organizations responsible for water management and water use, scientific institutions, industrial enterprises, farmers, local communities, NGOs, i.e. all interested parties, which can play a role at the basin level, in the creation of the scientifically-based management schemes. The development of works for careful and reasonable management of wetlands at the basin level should be necessarily accompanied by special educational activities that can effectively raise the level of awareness and understanding of the importance of the problem by different groups of people.

Since the development of tourism in Central Asia is on its initial stage, it is necessary right now to introduce into practice mandatory measures for organization of sustainable tourism, which would not lead to the degradation of wetlands. Such recommendations are presented in the document "Issues for stakeholders to address in achieving sustainable tourism and recreation in and around the wetlands". The key idea, which is stated in this document, is as follows: it is necessary to recognize that wetlands are a natural value and an indispensable part of the natural capital of the country, and that the effective protection and management thereof is mandatory for both the natural object itself and for the prosperity of the tourist business.

***The sustainable and competent tourist business on wetlands should ensure the following issues:***

- *mandatory investment in the development of the local communities and involvement of the local residents into business, which will create a favorable basis for the development and support at all levels of the local community, including the mandatory involvement of the indigenous population*

- *compulsory education and control over the behavior of tourists, so that the ethical and cultural traditions of the local community are respected and the tourist activities are compatible with the maintenance of the ecological properties of wetlands*

- *tourist business should work in cooperation with the organizations that manage wetlands, monitor the impact of tourism and recreation upon wetlands, and assist in analyzing the received information (in accordance with the document "Sustainable Tourism"), not allowing the impact of recreation to surpass the tolerance threshold of wetlands*

- *obligatory use of the Ramsar logo on the Ramsar Sites and promotion of the ideas and objectives of the Ramsar Convention for all tourists, visiting wetlands of international importance (Ramsar Sites)*

- *investments received from tourism should be necessarily directed to the maintenance or remediation of wetlands*

- *assessment, monitoring and management of the tourism activities should be included in the management plans of wetlands*

One of the important directions in the development of the Ramsar Convention in 2018 is preservation and sustainable management of wetlands, which are located in large cities. The celebration of the World Wetlands Day on February 2, 2018 was held under the slogan: "Wetlands for sustainable urban future". Indeed, urban wetlands determine the viability of cities in various ways. They reduce flooding, replenish drinking water, filter waste and improve water quality, improve urban air quality, promote human well-being and enable people to earn a living. All this will be even more important, since at present the number of people living in the cities exceeded 4 billion and is constantly growing. According to the forecasts, more than 66% of the mankind will live in the cities by the year 2050, as people will strive to live in the cities in search of easier and more profitable work. Unfortunately,

people are poorly informed about the important role of wetlands in the cities, until now many people consider wetlands in the city as wastelands where garbage is stored, wetlands are degraded, filled in and built upon. It is estimated that since 1900 at least 64% of wetlands disappeared, and, on the contrary, the number of cities has increased very much. The urban wetlands should be included in the urban development plans, wherein their conservation and wise management will be ensured with the preservation of all their ecological properties.

## 2.2. Definition and criteria of the practices for wetland management

In general, many projects and proposals on water resources, water hydro-ecosystems and water use programs and/or appropriate transboundary cooperation were developed in the Central Asian countries. In many of these developments the opinions are expressed and/or calls are sounded for reasonable and sustainable use of the biological resources, and consideration of certain benefits and services for the people living on wetlands. However, no special guidelines for sharing experiences and analyzing the good examples of wetland management were developed to date. This is explained simply: there was no understanding that wetlands, like ecosystems, possess a potential of services and benefits, and their wise use by local communities only increases this potential.

Earlier the two Guidelines were compiled for the Central Asian region: 1. The most important wetlands of North Kazakhstan (within the limits of the Kostanai and western parts of the Northern Kazakhstan oblasts) (Bragina, Bragin 2002); 2. The Guidelines for the Ramsar Convention on the Wetlands in Central Asia (Young et al., 2012). The first document showed the international importance of the lake systems of Northern Kazakhstan, their role for the migratory route of wetland birds, and provided certification of the surveyed wetlands and systematization of the lake ecosystems, which served for their nomination to the Ramsar list. The second guidelines represented a Russian translation of the information package of the Ramsar Convention: the information on the Convention as a whole, its strategic plans (2009-2015), the Ramsar list and the criteria for the definition of wetlands, manuals and handbooks important at that time for developing approaches to the wise use of wetlands, etc. These selected chapters, as well as the information package itself, are important for the supervisory authorities and managers in respect of the wetlands inventory and preparation of management plans for their sustainable use.

The definition and criteria for the best practices in wetland management depend directly on the initial development and subsequent implementation of management plans. As it is outlined in the Chapter of the Handbook-16: Managing wetlands *(3rd edition),* issued by the Ramsar Convention Secretariat in the year 2007, the most important functions of the planning process for wetland management should be as follows:

***Function I. To identify the objectives of site management***

This is the single most important function of the planning process. It is essential that management objectives be defined for each important feature of the ecological character of the site and for all other important features related to the functions and values of the site, including socio-economic, cultural and educational values. In other words, those responsible for developing the management plan must be clear about what they are trying to achieve.

***Function II. To identify the factors that affect, or may affect, the features***

The ability to achieve wise use and conservation objectives for wetlands will always be influenced to some extent by a number of factors, including trends, constraints and obligations, in fact anything that has influenced, is influencing, or may influence the features of the site for which objectives are set. It is essential that all the important factors should be identified, and that their impact on the site, particularly on the features of its ecological character, be considered. For the most significant factors, it may be necessary to undertake Environmental Impact Assessments (EIA) as part of the planning process.

### *Function III. To resolve conflicts*

On most sites there will be some conflicts of interest and difficulty in identifying priorities. It is essential that the planning process should be recognized as a forum for resolving conflicts and establishing commitments for the future.

### *Function IV. To define the monitoring requirements*

A function of monitoring, in the context of management planning, is to measure the effectiveness of management. It is essential to know, and to be able to demonstrate to others, that the objectives are being achieved. Thus, monitoring must be recognized as an integral component of management and planning. It should be designed to identify and manage change in ecological character of the site.

### *Function V. To identify and describe the management required to achieve the objectives*

In most cases where habitats or species require safeguarding, some action, i.e. management, will be necessary. Having established that a plan identifies the objectives of management, it follows that it must also identify, describe, and estimate the cost of the action required.

### *Function VI. To maintain continuity of effective management*

Continuity of effective management and monitoring is essential. Management processes must be adapted to meet a wide range of varying factors. Although management will change as circumstances require, the purpose of management should remain more or less constant. This is why continuity of effective management must be maintained, and not simply the continuity of any specified process. Continuity of monitoring is as important as is continuity of management.

### *Function VII. To obtain resources*

Management planning must identify and quantify the resources required to manage a site, and this should include the preparation of a detailed budget. This information can then be used to support and justify bids for resources. It is often difficult, particularly in developing countries, to allocate funds for the implementation of management plans, but it is essential that the management plan identify mechanisms for financing management. These mechanisms may include generating income on the site, for example, through tourism, harvesting of reeds, fishing, etc., and/or the establishment of a Trust Fund for the site or other long-term funding mechanism. In many cases it may be necessary to assess the capacity of the organization responsible for implementing the management plan at an early stage in its preparation. Shortfalls identified in the capacity assessment should be addressed in the Action Plan section.

### *Function VIII. To enable communication within and between sites, organizations and stakeholders*

Communication is essential within organizations, and also between organizations and individuals. Management plans and the management planning process are a means of presenting information in a structured and accessible format that will inform others about the site, the aims of management, and the management processes. Planning and management for the maintenance of ecological character are largely dependent on the availability of information. It is also important that those responsible for developing the plan should be aware of management techniques and procedures developed or improved elsewhere. The communications, education and public awareness (CEPA) components of the plan from its inception to full implementation should be clearly defined.

***Table 4.*** *The point assessment[1] of the management plans for the Ramsar Sites in Kazakhstan, Kyrgyzstan and Turkmenistan*

| Wetlands | Functions of the process of preparation and implementation of the Management Plans | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | I | II | III | IV | V | VI | VII | VIII | IX | X |
| Tengiz-Korgalzhyn Lake system | 5 | 5 | 2 | 3 | 4 | 4 | 3 | 4 | 4 | 3 |
| Alakol-Sassykkol Lake system | 4 | 4 | 1 | 2 | 3 | 2 | 2 | 3 | 3 | 2 |
| Issyk-Kul Lake | 4 | 5 | 3 | 3 | 4 | 4 | 2 | 4 | 3 | 4 |
| Song-Kul Lake | 5 | 5 | 3 | 3 | 4 | 4 | 2 | 4 | 3 | 4 |
| Chatyr-Kul Lake | 4 | 4 | 3 | 3 | 3 | 4 | 2 | 4 | 3 | 4 |
| Turkmenbashy Bay | 5 | 5 | 3 | 3 | 3 | 4 | 3 | 4 | 3 | 4 |

### *Function IX. To demonstrate that management is effective and efficient*

Those responsible for developing the plan must always be in a position to demonstrate that they are making the best use of resources and that management will be effective. In other words, the plan should provide the basis for any cost benefit analysis. It is also important that the need for accountability is recognized.

### *Function X. To ensure compliance with local, national, and international policies*

It is essential that the management plan recognizes and is compliant with a wide range of policies, strategies, and legislation. Occasionally policies may be contradictory, and consequently one of the functions of a plan must be to integrate the various policies. A National Wetland Policy and related national biodiversity plans and policies provide the context and framework for the development of a site management plan. In particular the plan should contribute to the implementation of the National Wetland Policy and/or national biodiversity strategy and other related plans and policies.

[1] Points for each function: from 1 (lowest) to 5 (highest)

# 3. The existing and potential Ramsar Sites, whereupon positive practices for conservation and management are implemented

## 3.1. Kazakhstan

### 3.1.1. Tengiz-Korgalzhyn Lake system

| | |
|---|---|
| ***Name*** | *Tengiz-Korgalzhyn Lake system* |
| ***Registration in the Ramsar List*** | *October 11, 1976* |
| ***Relation to the SPNT*** | *Korgalzhyn state nature reserve* |
| ***IBA*** | *KZ 051* |
| ***Area*** | *353.341 ha* |
| ***Coordinates*** | *50°25′59″ North latitude & 69°11′20″ East longitude* |
| ***Administrative belonging*** | *Korgalzhyn district of Akmola oblast and (partially) Nura district of Karaganda oblast* |

**Brief description**

Tengiz-Korgalzhyn system of lakes *(Fig.4)* is a set of shallow (mostly from 0.5 to 2.5 m) fresh, brackish and salt-water bodies, typical for Northern Kazakhstan. The largest of them are Tengiz, Issey, Sultankeldy, Assaubalyk. The origin of Korgalzhyn Lakes is associated with the same-named trough embracing the vast deltas of the Nura and Kulanotpes rivers. The entire territory of this lake system is a part of the Korgalzhyn state nature reserve, that was expanded from 258,963 to 543,171 ha in 2008. Due to the availability of several dams, the water level in most reservoirs of the reserve is quite stable. About 50% of water enters the system through the Nura River. The Tengiz Lake is the largest reservoir of the steppe zone with an area ranging from 113,600 ha to 159,000 ha, the maximum depth of 6.7 m and mineralization of 22-127 g/l. On most of the lakes extensive reed thickets are developed, but the Tengiz Lake has mainly open banks without high vegetation.

**Ecosystem services**

Tengiz-Korgalzhyn Lake system is one of the Important Bird Areas of Central Asia, through which millions of waterfowl and semi-aquatic birds migrate annually, including several thousands of globally threatened species such as white-headed duck and lesser white-fronted goose. Steppe landscapes surrounding the wetland area, serve as the habitat for colonies of globally threatened species – black-sided lapwing, numbering while nesting up to 150 pairs, which is close to the number of threatened black-winged pratincole - more than 700 pairs.

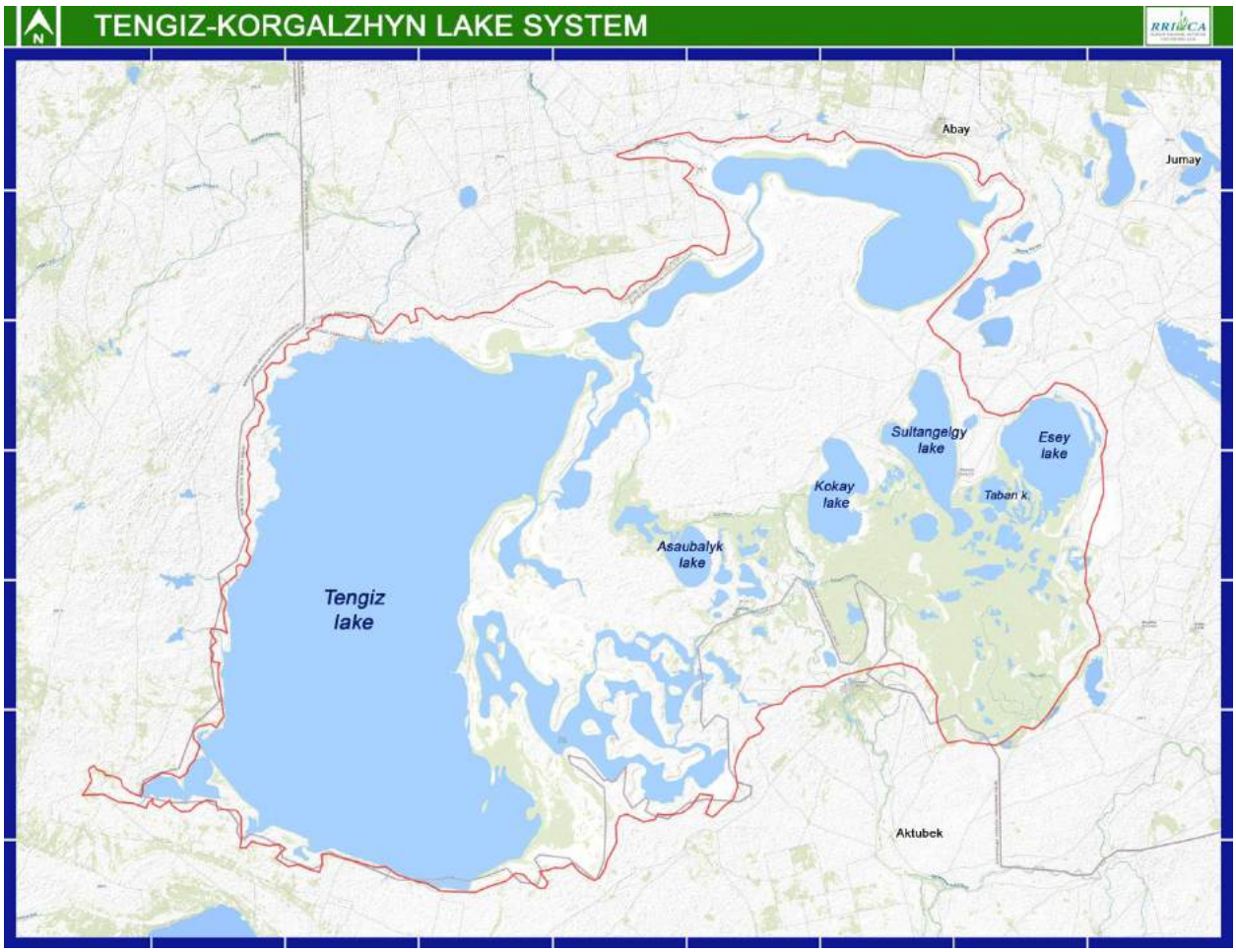


***Fig.4.*** *Localization of the wetlands of the Tengiz-Korgalzhyn Lake system*

The location of the central homestead of the reserve in 130 km from the capital of Kazakhstan, Astana, makes it possible to receive visitors the year round both in a well-equipped visitor center of the reserve, and on the tourist routes. Outside the reserve, but within the wetland area, cattle breading is developed in the form of farm households *(Fig.5).*

The overall socio-economic status of the local population is satisfactory according to the expert assessment. This is explained by the availability of rich steppe pastures, sufficient fish stocks and the proximity of a large city, where local fishermen, farmers and farm households sell their products, obtained on and around the wetlands: fish, beef, horse meat, mutton, poultry, milk and sour milk derivatives (koumiss, kurt, irimshik, sour cream, etc.).

## Local communities

The population of Korgalzhyn district of Akmola region (as of January 1, 2010) makes up 9,855 people. About 39 agricultural enterprises, 145 farm households are engaged in agricultural activities, for which 486,2 thousand ha of land is leased out, and 2,600 inhabitants of the district have personal farmsteads. On the Korgalzhyn-Astana highway the "Astana Agro Product" meat-processing plant is located. The meat-processing plant operates since September 14, 2011, its production capacity is 5,400 tons of meat per year and 138 employees work at the enterprise.

***Fig.5.*** *Cattle grazing in the wetland area, adjacent to the Korgalzhyn reserve (photo by A. Kozybakov)*

## Value of wetlands for local population

According to the results of the questionnaire survey the value of the wetlands for the local population is mainly determined as a habitat and migration place of birds (83% of the respondents), a place of excursions and field practices for schoolchildren and students (75%) and a place of animal and plant protection (58%).

## Assessment of the wetland condition

The respondents noted a rise in the water level in the reservoirs over the past few years, which contributed to an increase in the number of fish and birds and ultimately produced a beneficial effect on the socio-economic status of the local residents. In their opinion the greatest positive effect on the wetlands is produced by tourism (67%), the maximum negative effect is produced by such potential factors as desertification (100%), mining (92%), water intake, agricultural discharges and silting (83%), change of salinity and drainage (75%).

## Ecotourism

On the basis of the visitor center of the reserve open lessons and exhibitions are held on the following topics: "March of Parks", "Birds of the Korgalzhyn state nature reserve", "Festival of flamingos", etc. In 3D-tour "Virtual tour of the Korgalzhyn reserve", created in 2016, the visual information is offered, which is posted on the website of the Corporate Fund "The Biodiversity Conservation Fund of Kazakhstan" (BCFK)[2]. In the year 2016 the Reserve and its ecological trails were visited by 12,057 people with a peak of visits falling to the period of May-June. There is a website for tourism in the Korgalzhyn district: www.korg-tur.kz, where the relevant information is presented, including the number of visits to the reserve. With the assistance of BCFK the work was started for the creation of the reserve's own site. In recent years, mutually beneficial partnerships were developed with the Republican public association – "Association for Conservation of Biodiversity of Kazakhstan" (ACBK), which employees regularly bring groups of tourists to the reserve.

[2] 3http://www.fsbk.kz/node/1671

For the accommodation of tourists the local entrepreneurs offer guest houses, which meet the sanitary and hygienic requirements. The prices of the guest houses are acceptable for an average Kazakhstani. According to the owner of one of the most popular guest houses among the tourists, Amanzholova Bibinur Yermekbayevna, the foreign tourists staying at her house are basically "birdwatchers" *(Fig. 6).* She emphasizes, that "they are usually interested in a particular kind of bird, which is not remarkable very much for us. And if they manage to see this or another kind of bird, they are happy, like children, saying that they traveled over nearly half the world in search for this particular bird. The Kazakhstani are more interested in the very nature of the Reserve, as a whole, and in large and bright birds - these are mostly flamingos and pelicans".

The owners of the guest houses and yurts generally take care themselves for the cleanliness of the banks and wetlands, as the tourists, in their opinion, are much more attracted by the clean objects.

***Fig.6.*** *The family of birdwatchers from Germany with the family of the guest house hostess (photo by A. Kozybakov)*

**Conclusions on the work with the local population**

According to the results of the polling survey of the focal groups of the local communities 75% of the respondents determine the value of the wetlands as a place for excursions and field practices for schoolchildren and students. This circumstance can serve as the basis for the arrangement and development of an educational center in the protected area of the Korgalzhyn Reserve. The proximity of the wetlands to the capital of Kazakhstan allows us to hope for the flow of schoolchildren and students, sufficient to ensure the self-financing of its activities.

**The expert's opinion**

The local entrepreneurs provide services for the development of tourism mainly to the tourists-birdwatchers. Herewith, the bird-watching tours on horseback, bicycles and on foot not only to the banks of the wetlands, but also to the steppe areas beyond the wetland

borders, remain undeveloped. A certain potential for the development is also reserved for agro- and ethno-tourism.

## Wetland Management Plan

In the years 2006-2007 within the frames of the GEF/UNDP Project on wetland conservation, the first Management Plan (MP) for the Korgalzhyn State Nature Reserve for the years 2007-2011 was developed. The analytical report on the implementation of this MP was submitted to the Forestry and Hunting Committee of the Ministry of Agriculture of the Republic of Kazakhstan. In 2011, the second MP was developed by the Korgalzhyn Reserve for the years 2012-2016. Positive conclusion No. 03-09/2011, dated 06.06.2012, of the State Ecological Examination of the Akmola branch of the State Institution "Essil Department of Ecology" of the Environmental Regulation and Supervision Committee of the Ministry of Environment Protection of the Republic of Kazakhstan was received.

The MP of the Korgalzhyn Reserve, reflecting all aspects of the Reserve activities, including the conservation of the wetlands, was approved by the Committee of Forestry and Hunting of the Ministry of Agriculture of Kazakhstan.

## MP drawbacks

Despite more than twice increase in the area of the reserve in December 2008, the staff of the reserve remains the same up till now. There is a lack of material and technical basis for proper protection of the new area of the reserve. All this creates significant difficulties for protecting the reserve area and carrying out a complex of firefighting measures and increases the working hours of state inspectors of security service. In the spring-summer period there is a shortage of employees accompanying tourists on the ecological trails.

## MP implementation (on the basis of the results in 2012-2016)

- ***Strengthening the area protection from fires through fire prevention measures***

The workers of the reserve conduct a regular explanatory work among the population, since the area boundaries have no natural barriers. In the protected (buffer) zone, the land users grow grain crops. Besides, 6 hunting farms are located in the adjacent territories, which indirectly affect the state of the fauna of wetlands. An effective work with the population is facilitated by the fact that 7 State inspectors of the reserve protection service reside in three settlements, involved in the economic activities in the protected area, and they carry out the relevant explanatory work. The Korgalzhyn Reserve concluded an Agreement on the procedure of production of works in the buffer zone with all heads of hunting farms and land users. Besides, the joint plans for prevention and suppression of steppe fires are developed annually with the Department for Emergency Situations of the Korgalzhyn District.

In 2013-2015 one fire occurred each year in the area of the Korgalzhyn Reserve, which was liquidated by the reserve staff. In 2016 no fire was registered in the protected area. Every year a fire break is taken care of along the length of 650 km of the reserve border.

For extinguishing steppe fires the reserve has a water-carrier, 2 UAZ-Farmer vehicles with the capacity of 750 liters, 3 UAZ vehicles for 18 people, 8 radar beacons, 2 fire pumps, 2 sprayer blowers, 250 crackers. Additionally, there are fire shields at all cordons. There is a constant radiotelephone communication at 7 stationary and temporary posts with the day and night duty in the summer period for the prompt notification of the center about the incidents of steppe fires.

- ***Threatened species of birds***

When developing the Management Plan the main attention was paid to the monitoring of such species as white-headed duck, Dalmatian pelican and pale harrier, which are correspondingly observed by the reserve staff. These species were selected as threatened ones and included in the National Red Data Book Kazakhstan (2010).

- *White-headed duck (Oxyura leucocephala)*

With the expansion of the reserve one of the habitats of the white-headed duck - Saumalkol Lake was included, which level increased by 120 cm in the year 2015. In the autumn of the same year there were up to 150 species of white-headed duck, and in September 2016 - about 12,000 species. The number of species on the whole wetland is stable: in 2012 – 2,800 species, in 2013 – 2,200 species, in 2014 – 2,238 species, in 2015 – 3,000 species, but in 2016, the number of species registered was by an order of magnitude more – 23,000 species. In the specified years, during the summer period, up to 1 clutch of white-headed duck was registered on the monitoring route within 5 km, which is an average indicator. The maximum number of white-headed duck is registered in the middle of September, when pre-migratory gatherings of the migratory birds are formed.

- *Dalmatian pelican (Pelecanus crispus)*

In connection with preservation of an optimal water level in the Korgalzhyn Lake and meliorative measures, carried out for the preservation of fish stocks, the number of Dalmatian pelican species at the reservoirs of the Reserve varied within the following limits: in 2012 - 450 species, in 2013 – 430 species, in 2014 – 380 species, in 2015 – 1,200 species, in 2016 - 600 species. It is noteworthy that most of the reservoirs in summer are not accessible for accounting because of practically impassable reed thickets and the vastness of the water area. That is why the real number of these birds should be greater. To determine the number of species of Dalmatian pelican and other waterfowl throughout the Reserve area, it is necessary to use aerial census.

- *Pale harrier (Circus macrourus)*

Since 2008, after the expansion of the Korgalzhyn Reserve, large steppe areas - the habitats of pale harrier were added. Despite the fact that the boundaries of the protected area are ploughed every year, in the period of July-August steppe fires are caused by dry thunderstorms, which are eliminated by the forces of the reserve staff. By this time young birds of pale harrier and other terrestrial nesting birds usually are already fledglings, and their death from fires is almost excluded. The number of species in the reserve varies

depending on the number of mouse rodents: in 2012 - 30 species, in 2013 – 650 species, in 2014 – 960 species, in 2015 – 960 species, and in 2016 – 40 species.

- ***Work with the mass media and advertising and publishing activities***

In 2016 more than 50 publications on the actions carried out, significant events in the life of the reserve, as well as publications on the themes related to ecotourism and education were placed in the mass media. Four interviews, given by the employees of the reserve were broadcasted over the Republican television channels “Kazakhstan”, “Khabar”, “24 KZ”. In May 2016, the reserve together with the BCFK, with the support of the Eurasian Resources Group, organized an information tour for 15 representatives of the Kazakhstani media, who attended the visitor center and traveled through the area. In June of the same year, the reserve jointly with the United Nations Development Program in Kazakhstan held a press tour for such mass media as “24 KZ” television channel, “National Geographic, Kazakhstan”, “New Generation”, the “Association of Water Management of Kazakhstan”, “Strategy 2050”, "Kazakh radiosy”. In 2016 the Reserve developed, published and distributed banners, booklets, programs, press releases and other information and promotional materials in the total of 2,000 pieces.

The following materials were developed and published in Kazakh and Russian: the booklet “The Bird of the year 2016 - house sparrow”, the program “March for Parks -2016”, the booklet “Biodiversity of Korgalzhyn State Nature Reserve”, the leaflet “The rules of behavior outdoors”, the map-chart “Ecological routes of the Korgalzhyn Reserve” (with the assistance of the BCFK), the textbooks for children: “On Steppe Ecosystems for Children”, “A unique animal of the Eurasian steppes”, which have been handed over by the ACBK to the Korgalzhyn Reserve and distributed among the schools of the Korgalzhyn District. Also the wall and desk calendars with the drawings of prizewinners-contestants of the Festival “Flamingo-2016” were received from the ACBK.

In the frames of preparations for the International Exhibition EXPO-2017, a technological map of the ecological trail was developed, which was included in the register of places of visits by tourists and visitors to this International Exhibition.

- ***Carrying out ecological celebrations, competitions, actions***

According to the Management Plan, all scheduled actions and events in 2016, timed to the environmental dates, were held. Currently, the reserve has the basic equipment, which is required for the preparation and carrying out of presentations, demonstration of films and videos on environmental topics. In recent years, the main funds for events were allocated from the money earned due to the visitors of the visitor center and provided by the sponsors. In 2016 the III Republican Festival “Flamingo 2016” was held in Astana in the Capital’s Palace of Schoolchildren with the assistance of the BCFK and the financial support of the Eurasian Group (ERG).

All activities with the participation of students were carried out in 2016 in cooperation with the District Department of Education and teachers. Programs of events, regulations for competitions, festivals, etc. were jointly prepared. The employees of the reserve work with teachers, assisting them regularly in the preparation of presentations, open lessons, wetland exhibits, scientific and educational projects, etc.

**Expert’s opinion**

The Management Plan as a whole is assessed positively. The drawback is the lack of a well-established feedback from the local communities. It is possible to install, for example, special boxes for collecting complaints, suggestions and recommendations from the natural and legal entities, and to create a corresponding section on the site: www.korg-tur.kz and on the future site of the reserve. At the same time, it is necessary to exercise a strict control over timely responding to the complaints from citizens and organizations.

According to the results of the questionnaire survey, the local population suggests to create a mobile group for the protection of the wetlands with the involvement of the representatives of the District Department of Internal Affairs and the Akimat of the Korgalzhyn district, to organize voluntary Saturday work (Public Service Days) on a regular basis and to strengthen the environmental propaganda through the mass media. It is also necessary to organize familiarizing meetings of the local entrepreneurs with the representatives of the "Atameken" National Chamber of Entrepreneurs of Kazakhstan, the Department of Tourism and the Agricultural Administration of the Akmola region for consultations on the issues of the state support of the priority business directions, which include tourism and agricultural production. It is also necessary to create conditions for the development of transhumance as an agricultural activity that does not violate the balance of the natural steppe ecosystem.

**Recommendations**

It is necessary to pay particular attention to the organization of monitoring of the condition of the water bodies, in particular waterfowl and other components of biodiversity. The Management Plan should be focused on the analysis of the existing and potential threats to the wetlands and possible solutions to face, in particular, increasing water consumption and pollution by the cities and large industrial centers in the basin of the Nura River.

### 3.1.2. Alakol-Sassykkol Lake system

| | |
|---|---|
| ***Name*** | *The Alakol-Sassykkol Lake system* |
| ***Registration in the Ramsar List*** | *November 25, 2009* |
| ***Relation to the SPNT*** | *The Alakol State Nature Reserve* |
| ***IBA*** | *KZ 115* |
| ***Area*** | *914.663 ha* |
| ***Coordinates*** | *46°16′00″ North latitude & 81°32′00″ East longitude* |
| ***Administrative belonging*** | *Alakol district of Almaty oblast, Urzhar district of East Kazakhstan oblast* |

**Brief description**

Alakol-Sassykkol Lake system is partly included in the specially protected natural territory – the Alakol State Nature Reserve *(Fig. 7).* The area of the reserve makes up 65,671.9 ha (of which 17,776.9 ha is in the territory of the Alakol district, and 47,795 ha is in the territory of the Urzhar district). The central homestead of the reserve is located in Usharal. Alakol-Sassykkol Lake system occupies a desert depression between the mountain systems of Dzungarian Alatau and Tarbagatai in the south-eastern part of Kazakhstan. In the center of the depression there is a system of large lakes: Sassykkol, Koshkarkol, Uyaly, Alakol,

Zhalanashkol. The full-flowing Tentek River, taking its beginnings in Dzungarian Alatau, disgorges its waters into Sassykkol Lake from the south.

The wetlands of the Tentek River Delta present a complex system of channels, lakes, reaches and swampy lowlands, densely overgrown with reeds and forming a smooth-littoral landscape. The greatest value for the nesting of waterfowl and semi-aquatic birds in the eastern part of the delta is represented by the wetlands between Onagash, Zhalykol, Pelikaniya and Baklaniya Kuriya lakes, and in the western part – by the wetlands between the Baibal and Karamoyin lakes. In the Tentek River Delta the main nesting sites of many birds – Dalmatian and European white, black cormorant, spoonbill, gray and large white herons, black and white-winged black term, Caspian gull, little and Eurasian bittern, gallinule, rail, little crake and marsh crake are concentrated from the olden times. Coot, red-crested pochard, red-headed duck, great crested grebe and gray duck prevail on the delta lakes; black-necked grebe, gray goose, mute swan, common shoveler, teals (garganey and European teal), Ferruginous duck are small in number; black-throated loon, red-necked grebe and little grebe, whooper, pintail, white-headed duck, etc. are rare. White-cheeked tern appeared here on nesting for the first time in 2000, and little gull – in 2004.

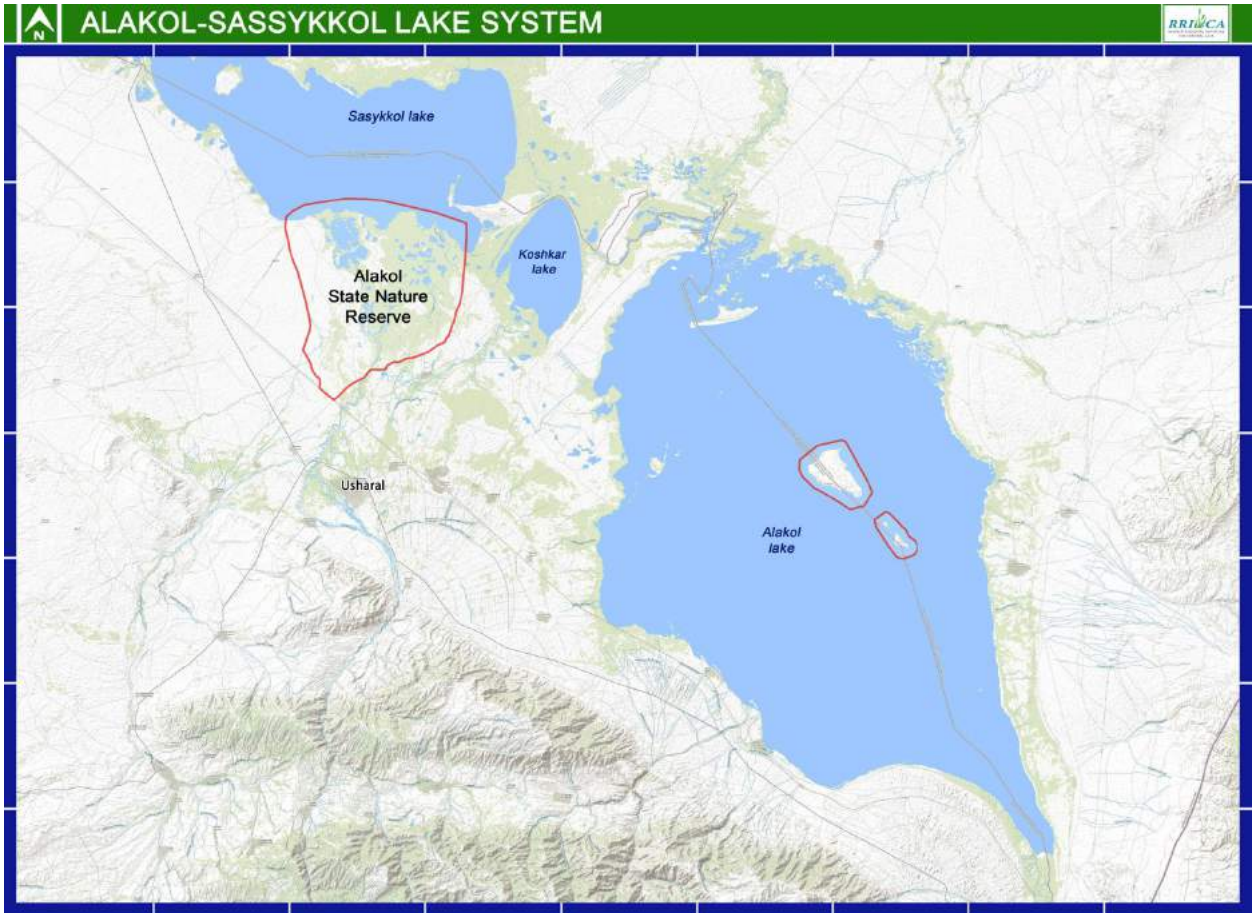


***Fig.7.*** *Locatization of the wetlands of the Alakol-Sassykkol Lake system*

## Ecosystem services

Tourism is poorly developed, not taking into account the recreation areas on the shores of Alakol Lake, which are popular, mainly, among the Kazakhstani and tourists from Russia. This is explained by the remoteness from the large cities: the distance from Usharal to Ust-Kamenogorsk is 510 km, and to Almaty - 582 km. The reserve does not deal with tourism, although it carries out environmental propaganda among the local population. In the vicinity

of Lake Baibal a tour circuit “Unique Flora and Fauna of the Alakol Nature Reserve” is functioning, which is open for visitors from mid-August to September. It is intended for carrying out educational excursions for local schoolchildren. This is a hiking trail with the length of 500 m, with information boards and a viewing platform along the route *(Fig. 8).*

***Fig. 8.*** *Observations from the viewing platform (photo from the archive of the Akakol Reserve)*

**Local communities**

The population of *the Alakol district of the Almaty region* (as of January 1, 2013) makes up 72,883 people. In the district there are 28 shops for processing vegetable oil, a shop for processing milk, 12 mills, 16 bakeries, a jam producing shop, two shops for the production of pike perch fillet and two shops for the production of fish meal. The industry of the Alakol district is also represented by such enterprises as Alakol Agro LLP - plant growing and cattle breeding, Uigentas-Bereke PC - bakery and confectionery production, Shygys Munai Onimderi LLP - oil refining, Alakol zholdary LLP - asphalt plant, etc.

The development of the district is determined by the natural and geographical location, significant production and economic potential of the district, proximity to the state border, passing through the district of Almaty-Ust-Kamenogorsk, Almaty-Usharal-Druzhba motor roads of Republican subordination, a section of Almaty – Urumchi international railroad and a section of Atasu-Alashankou international pipeline.

The population of the Urdzhar district of the East Kazakhstan oblast (as of January 1, 2013) makes up 80,612 people. The economy of the region is represented mainly by agriculture, based on crop production (oil and grain crops) and cattle breeding (big cattle, small cattle), processing of agricultural products and medium industrial enterprises. The Urzhar district is famous for its meat processing plant. To date, the district provides the oblast with meat and sausage products, produced by Shwabskiye Kolbaski LLP. There is also a company specializing in coal mining - Madina LLP. A total of 6,365 small and medium-sized businesses was registered in the district, including 76 legal entities (1.2%), individual entrepreneurs - 3,903 (61.3%) and farm households - 2,386 units (37.5% %).

The geographical location produces a favorable effect upon the economy of the Alakol and Urzhar districts. Both districts have large customs terminals on the border with China: Bakhta customs in the Urzhar district and Dostyk station in the Alakol district.

## Value of wetlands for the local population

According to the results of the questionnaire survey, the value of wetlands for the local population is determined mainly as a habitat and a place of migration of birds - 65%, as a place for the protection of animals and plants - 61%, and as a source of income, as a source of water and as a place of recreation of the population - 39%.

## Assessment of the wetland condition

The respondents noted that over the past few years the water level in the reservoirs has increased, recreation areas have expanded, and tourism is developing. The greatest positive effect on the wetlands is produced by tourism (87%), shut-off/regulation of the water regime (74%), and development of settlements (65%), the maximum negative effect is produced by such potential factors as mining (87%), desertification and agricultural waste (78% each), silting (65%), construction of new enterprises and water intake (61% each).

## Ecotourism

- ***Development of eco-tourism in the Alakol district***

In recent years the shore of the Alakol Lake is steadily developing. According to the plan of the lake shore infrastructure, approved in 2006, the recreation area makes up 1,042 ha. In 2012 the number of vacationers in the villages of Akshi and Koktuma made up 28,540 people, but in 2013 their number increased up to 35,000. In 2012 three projects were financed according to the Program "Business Road Map-2020". According to the data of the year 2013, 7 hotels, 51 health resorts, 11 recreation centers and 3 recreation camps operated in the sphere of tourism, including the "Zhalyn" camp for 200 persons, and the following boarding houses: "Koktuma" for 200 persons, "Pelikan" for 250 persons, "Ala Tengiz" for 150 persons, "Alassu" for 150 persons, etc. The services at the camp sites and private houses are offered at an affordable price, but it varies during the summer period.

At present there is a tourist company, called "Alakul Tour", which is a branch of the "Asia Safari Service" travel agency and has a license for tour operator activities. The travel agency works mainly with foreign tourists, has partners in European countries, with which it works to attract tourists and to organize tourist trips. The work of the company is aimed at the development of tourist programs, which satisfy demand of clients in extreme sports travels. The company has an airfield in the village of Akshi at Alakol Lake, on the Zhabyk plateau, in the area of Kolassu Lake (1,850 m above the sea level), and a camp consisting of 5 prefabricated houses with the appropriate amenities. The company also has Ural vehicles with trailers, which are also equipped for relevant housing. In the season from May to November, up to 80 foreign tourists are accepted. The tour is designed for 10 days. Eco-tourism is mainly for ornithological purposes, many tourists from European countries come for bird-watching tours.

- ***Development of eco-tourism in the Urzhar district***

The "Barlyk-Arasan" health resort is situated in the foothills of Arasan-Tau, in the Barlyk valley, where water of the local sources is similar by chemical composition and weak

radioactivity to mineral waters of Tskhaltubo, Sary-Agash, Alma-Arasan. In the area adjacent to the health resort, in the upper reaches of Arasan River, originating in Barlyk Mountains, just in half a kilometer from the health resort, Barlykarasan spring wells are located, which have 13 water outlets. Waters of spring wells are weakly hydrogenous, sulfate-chloride, sodium, calcium, with a high content of silicic acid. The water temperature is 20-42°C, in the bedrock and at a depth of 35 m it reaches 44.5°C. Free-effervescing gases contain nitrogen. Hot spring baths are used in summer to treat skin, rheumatic, and joint diseases. Such natural factors as pure mountain air, picturesque landscape, steppe herbage, bathing in the bitter-saline Alakol Lake also play an important role for the treatment of guests.

Currently, more than 60 health resorts and recreation centers operate on the shore of this lake, such as “Aigerim”, “Dorozhnik”, “Alakol”, “Asem”, “Barlyk Arasan”, etc.

**Conclusions on the work with the local population**

The main problems, faced by the local communities and visiting tourists, include: the lack of sewage networks (30%); unsatisfactory condition of highways (26%); undeveloped trade of souvenirs, guides, maps (22%); absence of fencing from livestock and vehicles in the shore area (17%); poor regulation of tourism by the local authorities (13%).

The Management Plan, embracing all territory is not developed. And the MP of the Alakol Reserve cannot substantially reflect the management of the Alakol-Sassykkol Lake system, since the reserve occupies only 7% of the wetland territory.

Nevertheless, the main goal of the future MP in this wetland should be the preservation in the natural state of typical, rare and unique natural complexes, with the whole system of their components, and harmonization of the relationship between human and nature.

***To achieve this goal, the following tasks must be fulfilled:***

- *Conservation and restoration of natural ecosystems, biodiversity*
- *Identification of patterns of natural development of natural complexes, obtaining new scientific knowledge about the state of the environment, species and communities*
- *Introduction of the system of monitoring of the habitat and its components, assessment of their condition, detection of interference and threats and their elimination*
- *Ensuring compliance with the wetland protection regime*
- *Timely elimination (prevention) of the negative processes, ensuring sustainable functioning of habitats*
- *Environmental education and informing the public*

**Recommendation**

The entrepreneurs in the sphere of tourism have proposed to create a public utility company at the expense of the owners of the recreation areas for constant cleaning the shores of Lake Alakol. To ensure the effective management of the wetlands it is recommended that an appropriate Management Plan will be developed with the involvement of the experts from the Alakol State Nature Reserve. Besides, it is important to organize Public Councils for the management of these wetlands under the administrations of the Alakol and Urzjar districts, consisting of the representatives of the farmers' associations, tourism and non-governmental organizations, the Alakol State Nature Reserve, and scientists. Public Councils should also include the representatives of the local authorities as technical secretaries of the Councils (but with the rights of observers)[3].

### 3.1.3. Lesser Aral Sea and Delta of the Syrdarya River

| | |
|---|---|
| ***Name*** | *Lesser Aral Sea and Delta of the Syrdarya River* |
| ***Registration in the Ramsar List*** | *February 2, 2012* |
| ***Relation to the SPNT*** | *Barsakelmes State Nature Reserve* |
| ***IBA*** | *KZ 043 (Lesser Aral Sea) and KZ 044 (Syr Darya River Delta)* |
| ***Area*** | *543.171 ha* |
| ***Coordinates*** | *46°20′50″ North latitude & 61°00′09″ East longitude* |
| ***Administrative belonging*** | *Aral district of the Kyzylorda oblast* |

**Brief description**

The wetlands of the Aral Sea and the Syr Darya River Delta are not a specially protected natural territory at the moment *(Fig. 9).* However, the process for inclusion of the "Syr Darya River Delta" section into the neighboring Barsakelmes State Nature Reserve is at the final stage of coordination with the local authorities. After joining of the wetland site to the reserve the total area of the latter, which currently makes up 160,826 ha, will increase by 2,300 ha, and taking into account the protection area - by 5,851 ha. The central homestead of the reserve is located at the town of Aral in Kyzylorda Oblast.

**Ecosystem services**

The local population is mainly engaged in fishing *(Fig. 10),* and, to a lesser extent, in cattle breeding and melon-growing. Tourism is practically not developed.

[3] Recommendations or requests of the Public Councils should be forwarded in writing to those state bodies, which competence includes the issues considered by the Councils. If the issues are not satisfactorily resolved by state bodies, the recommendations are forwarded to the higher authorities. Financing of the activities of the Public Councils may be envisaged within the frames of the state social procurement.

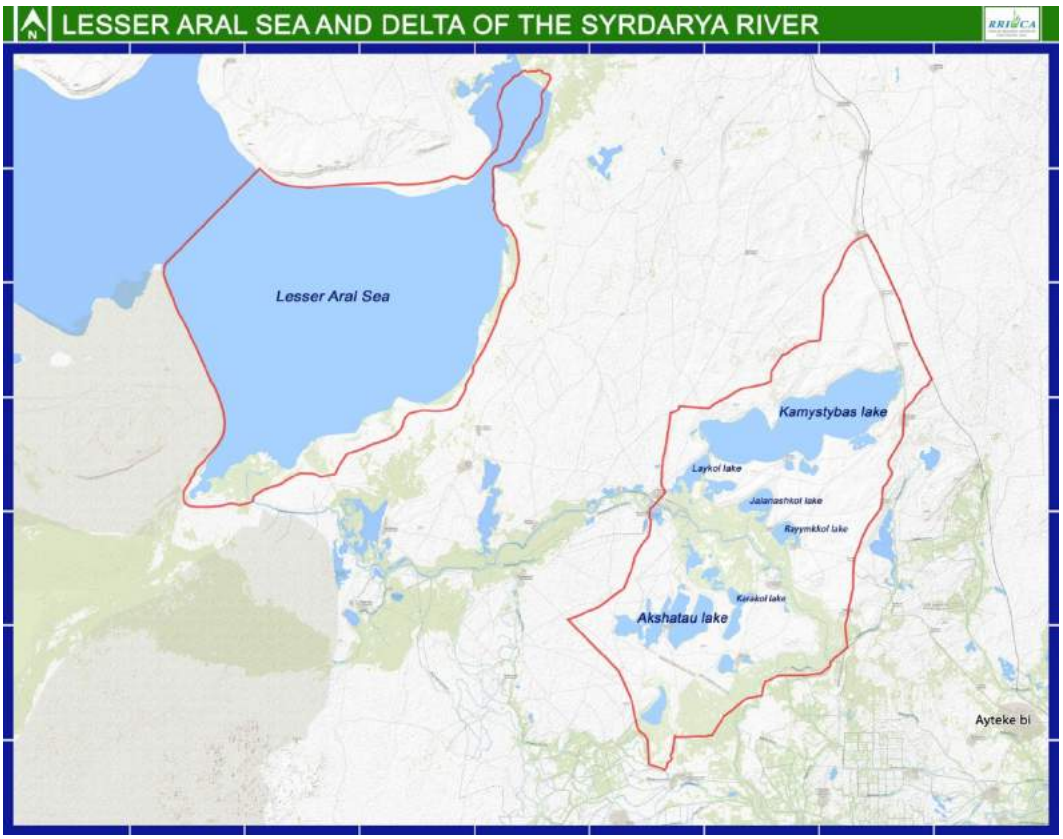


***Fig. 9.*** *Localization of the wetlands of Lesser Aral Sea and Delta of the Syrdarya River*

## Local communities

The population of *the Aral District of the Kyzylorda oblast* (as of January 1, 2015) makes up 77,029 people. The main branches of the national economy are fishery and fish processing, salt extraction and cattle breeding.

***Fig.10.*** *Local fishers (photo by A. Kozybakov)*

In the region there are huge reserves of sodium chloride and sodium salt, merabilite, thenardite and quartz sand for the glass industry. 376 agricultural enterprises are engaged in agricultural activities, of which 368 are farm households. The main agricultural enterprises are Kulandy LLP, Bereket, Koktem, Nessibe, Ykylas and Baidaulet farm households. The total number of livestock: cattle - 43,035, sheep and goats - 90,236, horses - 22,439, camels - 21,123, birds - 1,496. About 61 entities are engaged in fishing, wherein 187 people are employed. The hotel and restaurant business embrace 18 entities, employing 78 people.

**Value of the wetlands for the local population**

According to the results of the questionnaire survey the value of wetlands for the local population is mainly determined as the habitat and migration place of birds - 85%, as a place for the protection of animals and plants - 55%, and as a source of income - 35%.

**Assessment of the wetland condition**

Most respondents believe that the greatest positive impact on the wetlands is produced by tourism (85%), construction of new enterprises (75%), introduction of animal and plant species (70%) and development of settlements (65%), the negative effect is produced by desertification (75%), silting and agricultural wastewater discharges (60% each). Accounting for the fact, that the wetland is not yet included in the reserve, the sanitary condition of the water area and shore area can be assessed as satisfactory.

**Ecotourism**

Tourism is poorly developed in comparison with the above-described Ramsar Sites of Kazakhstan.

**Expert's opinion**

Not all rural residents welcome the appropriation of the Syr Darya River Delta as a specially protected natural territory, as this will entail a complete ban on economic activities, including fishing, which for many families is a traditional source of food and income.

There is no Management Plan for this wetland. The MP should correspond to the same provisions proposed for the Alakol-Sassykkol Lake system, taking into account a possible increase in the level of the Lesser Aral Sea and the subsequent construction of new dams. It is necessary as an integral part (with the prohibition of economic activity) within the limits of the wetlands, which will be included as a part of the Barsakelmes State Reserve.

**Conclusions on the work with the local population**

According to the results of a polling survey of the focal groups of the local population, 40% of the respondents consider that such potential factor as mining would produce a positive effect. This fact, as well as the fact, that most respondents consider the construction of new enterprises and the development of settlements as a positive effect, indirectly point to social deprivation of the local population. Practically all respondents receive income from either

fishing or hunting, or in the form of wages, and to a lesser extent from tourism. Every second respondent believes that the water level has increased over the last decade, and the number of birds and fish has increased.

**Expert's opinion**

To ensure the effective management of the wetlands, it is recommended to organize a permanent Public Council for the management of the wetlands under the Administration of the Aral district of the Kyzylorda oblast from the representatives of farmers' associations, tourism and non-governmental organizations, the Barsakelmes Reserve, and individual scientists. The Council should also include a representative of the local authorities as a technical secretary of the Council without the right to vote. The recommendations of the Public Council should be sent in writing to those State bodies, which competence includes the issues considered by the Councils. If the issues are not satisfactorily resolved by State bodies, the recommendations should be sent to the higher authorities. Financing of the activities of the Public Councils can be envisaged within the frames of the State social procurement.

### 3.1.4. Karakol Lake

| | |
|---|---|
| ***Name*** | *Karakol Lake* |
| ***Relation to the SPNT*** | *The Karakiya-Karakol Wildlife Sanctuary* |
| ***IBA*** | *KZ 012* |
| ***Area*** | *3,773 ha* |
| ***Coordinates*** | *43°53′44″ North latitude & 51°30′93″ East longitude* |
| ***Administrative belonging*** | *Aktau, the Mangystau oblast* |

**Brief description**

Karakol Lake is located within the administrative boundaries of Aktau, in its industrial zone, and is fed by the discharge waters (normatively clean) of the enterprise MAEK-Kazatomprom LLP. The area of the lake depends on the dynamics of its production capacities and varies within the range of 3,500-5,000 ha *(Fig.11)*.

Within the frames of the project of construction of thermal power stations TPS-1 and TPS-2 in the Karakol mountain area, a so-called pond-cooler was built in a natural topographic low as an element of the cooling system of the corresponding equipment of the stations. The water taken from the Caspian Sea, after passing the cooling cycle in the pond, returns to the Sea as normatively clean water. As a result of the long-term passage of large volumes of the sea water (about 1 billion cubic meters per year), the cooling pond has turned into a shallow lake. Upon the organization of this reservoir it was not supposed that the latter would turn into a lake with the favorable conditions for the habitation of aquatic and semi-aquatic animals, in particular, migrating, nesting, and wintering birds.


***Fig.11.*** *Localization of Karakol Lake*

So, here is the nesting place for mute swan, big and small bittern, small white, gray and red herons, sheld duck, wild duck, gray duck, common shoveler, rufous-crested duck, marsh harrier, quail, dikkop, various seagulls, terns and waders. Dalmatian and European pelicans, little cormorant, flamingo, pond, cattle egret and little herons, spoonbill, glossy ibis, swans (mute swan, whooper swan, Bewick's swan), white-eyed pochard, white-headed duck as well as common crane and demoiselle crane, black-bellied sandgrouse piper and Pallas's sandgrouse and Pallas's gull flow over.

***Fig. 12.*** *General view of Karakol Lake (photo by A. Kozybakov)*

Besides, 7 species of carnivorous birds may be observed: osprey, snake eagle, booted eagle, steppe eagle, imperial eagle, golden eagle, white-tailed eagle. In total 175 species of birds, 11 species of mammals, 8 species of reptiles and 1 species of amphibians have been recorded, and more than 500 species of invertebrate animals (insects and arachnids)[4] have been observed.

***Fig.13.*** *Flamingo (Phoenicopterus roseus) on Karakol Lake (photo by A. Kozybakov)*

## Ecosystem services

Hunting and fishing are prohibited on the Lake Karakol as part of the Karakiya-Karakol Wildlife Sanctuary. The wetland is used by non-governmental organizations and educational institutions in Aktau for educational purposes *(Fig. 14).* Every year children and young people take part in voluntary Saturday works (Public Service Days) on the shores of the lake, organized by the Administration of the Ustyurt State Nature Reserve within the frames of the international environmental action "March of Parks" *(Fig. 15)*

***Fig.14.*** *Birdwatching by schoolchildren at the Karakol Lake (photo by A. Kozybakov)*

[4] Inventory and determination of the status of animals have been conducted by the "Ken Dala" Public Association at the instruction of MAEK-Kazatomprom LLP with the involvement of the scientists from the Institute of Plant and Animal Ecology of the Ural Branch of the Russian Academy of Sciences and the Ustyurt State Nature Reserve.

Technical support is provided by MAEK-Kazatomprom LLP, which also annually installs and updates the information stands along the shore of the lake.


***Fig. 15.*** *In the course of the regular environmental action "March of Parks" (photo by A. Kozybakova)*

## Local communities

The population of the city of Aktau makes up 185,9 thousand people. In 1961 the Aktau village appeared here, with lately transformed into a modern city-port. Aktau has no natural sources of drinking water and it is practically completely supplied with the desalinated sea water, which is produced by its dilution with the distillate, produced in multiple-effect evaporative units.

The water is divided into drinking and technical - hot and cold. In 1968 industrial desalination plants were built for the water supply of the city, using secondary steam from TPS (including the BN-350 fast neutron reactor, currently decommissioned). Aktau is one of the Kazakhstani centers for the development of oil and gas fields.

## Value of wetlands for the local population

According to the results of the questionnaire survey, the value of the wetland is determined mainly as a habitat and migration place of birds - 82%, a place of recreation for local population - 50% and a place of excursions and field practices for schoolchildren and students - 41%.

## Assessment of the wetland condition

The water level of the lake varies between 3,500–5,000 ha, depending on the production capacity of the MAEK-Kazatomprom enterprise. The sanitary condition of the shores is estimated by the expert as satisfactory.

The respondents have noted that the greatest positive impact on the wetland is produced by tourism (82%), the maximum negative effect is produced by such potential factors as mining (82%), construction of new enterprises (68%), development of settlements and agricultural effluents (64%) from small farm households. Many respondents (64%) also believe that the level of control over hunting and fishing is insufficient.

**Ecotourism**

Lake Karakol is under the protection of the Ustyurt State Nature Reserve. It is used for educational purposes by educational institutions and non-governmental organizations of the city of Aktau. The organized tourism is not developed.

**Expert's opinion**

The Department of Tourism of Mangistau oblast and the local entrepreneurs do not use the available tourist potential of the wetland. It could be possible to arrange an educational wetland center, make ecological trails, and install viewing platforms for bird observation. Thus, it is possible to contribute to the improvement of the state of the wetland ecosystem by reducing the pollution with the wastes of unorganized tourism and excluding bird poaching, as well as by developing small businesses, providing services to the visitors and local vacationers.

There is no Wetland Management Plan. However, in the future, it should comply with the principles and provisions, which are proposed in relation to the Alakol-Sassykkol lake system, but with the following condition. The fact is that Karakol is of a technogenic nature, its water regime depends on the production capacity of the enterprise of MAKO-Kazatomprom LLP, and the whole lake is located within the administrative boundaries of the city of Aktau. Therefore, the MP should take it into account and fit itself into the development plan for the entire socio-economic agglomeration of the city of Aktau.

To ensure the effective management of the wetland it is recommended to organize a Permanent Public Council for the management of the wetlands under the Administrations of the city of Aktau from the representatives of the associations of farmers, tourism and non-governmental organizations, the Ustyurt State Nature Reserve, and individual scientists. The Council also should include a representative of the local authorities as a technical secretary of the Council without the right to vote.

## 3.2. Kyrgyzstan

### 3.2.1. Issyk-Kul Lake

| | |
|---|---|
| ***Name*** | *Issyk-Kul Lake* |
| ***Registration in the Ramsar List*** | *December 26, 1976* |
| ***Relation to the SPNT*** | *Issyk-Kul State Nature Reserve* |
| ***IBA*** | *KG 231* |
| ***Area*** | *624,439 ha* |
| ***Coordinates*** | *42˚02˝and 42˚88˝ North latitude 76˚44˝ and 78˚57˝ East longitude* |
| ***Administrative belonging*** | *Issyk-Kul, Jeti-Oguz, Tyup, Aksu and Tong districts of the Issyk-Kul oblast* |

**Brief description**

The Issyk-Kul Lake is located in the north-eastern natural and climatic zone of Kyrgyzstan and occupies a large high-mountainous (the height is more than 1,600 m) and deep tectonic basin. It is framed by the Kungei Ala-Too ridge from the north and by the Terskey Ala-Too from the south. The area of the Issyk-Kul basin valley, including macroslopes of the surrounding ridges, a narrow strip of the piedmont plume and many rivers, which flow into the lake, makes up more than 250 $km^2$, the greatest width is 100 km. The relief is very complex, three main complexes are distinguished: flat, foothill and mountainous.

This basin is a part of the geographical province of the Northern Tien Shan. It is stretched from the west to east for 240 km, from the north to south - 75 km. The length of the Issyk-Kul Lake itself is 182 km, the largest width is 58 km, the average depth is 270 m, and maximum depth is 702 m. The water surface area is 6,236 $km^2$, it ranks the seventh among the lakes of Northern Eurasia and ranks the third for the depth (after the Baikal Lake and the Caspian Sea), and it surpasses 1.7 times Lake Balkhash by the volume of water (1,732 $km^3$).

The Issyk-Kul State Nature Reserve is administratively located in the Issyk-Kul oblast, which borders on the Chuy oblast in the west, the Naryn oblast in the south, Kazakhstan in the north, and China in the east and south. The oblast is divided into 5 administrative-territorial districts: Aksu, Jeti-Oguz, Issyk-Kul, Tong, Tyup districts.

The highest peaks of the world, such as the Victory Peak (7,439 m) and the Khan Tengri Peak (6,995 m) are located in the oblast territory. The territory as a whole is in the belt of middle latitudes. The climate is significantly influenced by the mountain relief and the Issyk-Kul Lake itself, stipulating a soft winter in the region. The precipitation level varies from 130 mm/year in the area of Balykchy, up to 1,000 mm - at the border with Kazakhstan. The Reserve sites are located in 4 administrative districts and border on the lands of 17 ayil okmotus. The Administration of the reserve is located in the city of Balykchy. The total area of the Issyk-Kul State Nature Reserve makes up 18,999 ha, of which the water area occupies 16,720.2 ha and the land occupies 2,278.8 ha *(Table 5).*


***Fig. 16.*** *The Map of the Biospheric Territory of the Issyk-Kul Lake*

***The core zone (the main zone)* –** any economic and other activities are prohibited, except for the measures, aimed at preserving the natural complexes in their natural state, remediation and preventing the change of natural complexes and their components as a result of an anthropogenic impact, maintaining conditions, which ensure sanitary and fire safety; implementation of the environmental monitoring, carrying out of researches, implementation of the state control over the compliance with the established regime.

***The buffer zone* –** the following activities are prohibited: creation of new settlements, provision of new territories for hunting grounds and bases, organization of hunting farms, construction, deployment and operation of production facilities, exploration and mining, all types of woodcutting, except for selective forest sanitation in coordination with the relevant scientific institutions, introduction (acclimatization) of new plant and animal species, actions, which change the hydrological regime of the reserve core, and other activities, which produce a harmful effect on the ecosystems, and economic activities, that threaten the state of natural complexes and objects.

***The protected zone* –** the main types of economic activities are allowed provided that they do not damage the state of natural components. It is prohibited to collect medicinal raw materials, fruits, berries and flowers, as well as plant species, which are listed in the Red Data Book of Kyrgyzstan and are under the threat of extinction, to conduct hunting and trapping animals, destruction of nests, burrows, various shelters and dwellings of wild animals, as well as the collection of eggs of birds and reptiles, acclimatization of wild animals, other activities, which entail a reduction of natural, scientific, cultural and aesthetic importance of the territory.

***Table 5.*** *Functional subdivision of the territory of the Issyk-Kul State Nature Reserve*

| Sites and their area, ha | Core zone (the main zone) | Buffer zone | Protected zone | Total |
|---|---|---|---|---|
| Toru-Aigyr | 2,408.1 | | 1.9 | 2,410 |
| Prishib | 5.0 | | | 5 |
| Homestead | 1.5 | | 3.5 | 5 |
| Zharkymbayev | 74.8 | | 0.2 | 75 |
| Orukty | 951.8 | 4.1 | 9.1 | 965 |
| Oi-Tal | 1,022 | | | 1,022 |
| Sary-Bylak | 443.0 | | 135.0 | 578 |
| Sukhoi Khrebet | 210.0 | | | 210 |
| Koi-Sary | 1,139.4 | 22.4 | 180.2 | 1,342 |
| Ala-Too | 610.0 | | | 610 |
| Karagoo | 193.0 | | | 193 |
| Ottuk | 11,584 | | | 11,584 |
| **Total** | **18,642.6** | **26.5** | **329.9** | **18,999** |

Upon zoning of the reserve area, the interests of the local communities, which traditionally use the shores of the lake for recreation, especially near the settlements, were taken into account in order to minimize conflicts between the interests of the local population and the reserve. The zoning complies with the adopted environmental legislation of the Kyrgyz Republic and corresponds to the purposes of conservation of biodiversity and unique landscapes.

The lake is fed from the rivers originating high in mountains from the glaciers (60% of the run-off) surrounding the basin. There are 834 rivers in the Issyk-Kul basin. The three areas are distinguished by the nature of the hydrographic network and water flow of the rivers. The first one is the poorest in surface waters, along the northern shore to the Chaktal river and along the southern shore to the Tosor river. The second area is also located along the northern shore to the Shaty river (the right-bank tributary of the Tyup River). Here are more than 20 rivers, which are used out for irrigation, and only the Ak-Suu (small and large) rivers bring their waters to the lake. The third area occupies the eastern and south-eastern part of the basin and is rich in surface waters. There is a lot of precipitation, Dzhergalan, Tyup, Karakol, Chon-Kyzyl-Su, Zauka, Barskaun and Tossor rivers have permanent streams. To the west, in 6 km from the shore, the floodplain of the Chu river is located, which gives a part of its waters in certain years to the Kutemaldy channel during the spring floods. The Issyk-Kul Lake itself has no overflow stream, the water therein is brackish, but the salinity is insignificant (almost twice less than that in the Aral Sea), the color of the water is dark-blue, greenish near the shore, the transparency is great: the visibility limit in the central part of the lake is equal to 1.5 m on the average (up to 20.4 m in September).

**The vegetation cover in the shore area depends on the following factors:**

**1. The effect of zonality (1,600-1,700 m above the sea level).** At these altitudes, in accordance with the vertical zonation, a meadow-steppe belt is located with separate segments of fescue and wormwood, segments of seaside wormwood, estragon, Hungarian brome grass, meadow grass, and barberry bushes here and there. **2. The influence of the Issyk-Kul Lake itself,** which leads to the emergence of the wetland shore habitats with swampy-meadow and tugai vegetation, as well as saline sites. **3. Anthropogenic factors:** above the coastal stripe on the macro-slopes there are scattered numerous villages and large areas of fields of various crops, including weeds (blewit, bittercress, oxtongue, etc.), which have also penetrated into the coastal stripe.

***Fig. 17.*** *The south-west shore of Issyk-Kul Lake. The wetlands with swampy-meadow and tugai vegetation (photo by A.T. Davletbakov)*

The swampy-meadow and tugai associations prevail throughout the shore, because the limiting factor of the spread of other plant groups is the water regime of soil. The swampy-meadow vegetation occupies the shore areas and all lower areas with closely occurring ground waters. The shallow coastal stripe of the Issyk-Kul Lake is gradually being overgrown: in the deepest places, only plankton algae are spread, closer to the shore - charophytes, which are replaced by pondweeds. They are followed by reeds: scirpus, reed mace, cane and horsetails. The latter populate either shallow areas, or periodically flooded areas. This is already a transitional group of plants from water to land plants. Further from the shore are plant groups, composed of various sedges with the addition of the buttercup, orchis, etc. Still higher, with a decrease in moisture there are bog soils.

***Fig.18.*** *The north-west shore of Lake Issyk-Kul with reeds and swamp-foxtail grass on the swampy-meadow saline soils (photo by A.T. Davletbakov)*

The main associations are replaced by meadow grasses or mixed herbs with a continuous cover, composed of barley, estrogen, foxtail and a large number of meadow herbs. Here are also the areas overgrown with weeds, mostly spread close to agricultural crops. With soil salinization separate types of cheegrass appear in the meadow associations, which are especially spread in the area of Balykchy, forming continuous thickets. Such are the transitions of plant groups in fine-grained soils. On the pebbles, where aeration of the soil is better, there are thickets of bushes, consisting mainly of sea-buckthorn (dzherganak), on the same pebbles, on the woodcutting sites the vegetation cover is absent.

Dry steppificated area. This type is zonal and is represented by steppe plant groups, composed of steppe fescue, sea wormwood, feather grass with winter fat and various weeds. Saline sites on the territory are very common, especially near the city of Balykchy. These are slightly saline soils, occupied by cheegrass tugai or meadows with barley. In the areas with a strong salinity, occupying a relatively small area, lime-saltwort vegetation usually grows with the addition of weeds, or ephemeral-saltwort and biyurgum vegetation.
Ichthyofauna of Lake Issyk-Kul consists of 26 species, of which 7 species are aboriginal, including the two species included in the “Red Data Book” (the Issyk-Kul scaleless osman and Issyk-Kul marinka). Such species as the Schmidt’s dace, stunned fish, and European carp have become rare. Minnow, gray mullets, gudgeon are rough fish; most of them are spawn-eaters, their number in the lake, especially that of gray mullets, is high.

In the Issyk-Kul State Nature Reserve, there are 9 types of reptiles and 3 types of amphibians. The Turanian toad and the Central Asian frog are among the amphibians, and the lake frog was occasionally brought in the early 1960-s from the ponds of one of the fish farms and mow is considered usual.

Lake Issyk-Kul is a place for mass wintering of waterfowl. In general, in different years from 50 to 100 thousand species (30 types) of birds winter on the lake, that is 66,231 species on the average. Mallard ducks, gray ducks, pintails, European teals usually find food and rest near the shore; further from the shore, in the 20-30 m in the shallow waters there are coots, bullheads; in the sublittoral zone there are rufous-chested and Common pochards, grebes (horned, black-necked, little, great-chested, red-necked grebes), tufted ducks, buff-breasted mergansers, as well as swans - mute and whooper swans, less often Bewick's swans. The shallow coastal stripe with the depths of no more than 10 m covers an area of 478 ha and, in fact, is the main food reserve for the wintering birds.

***The western zone*** of the lake embraces the shore part of the lake from the Chyrpykty Cape of Balykchy Bay and Ak-Olenskiy - Ak-Bulun Island to the mouth of the Ak-Terek River. This zone is characterized by an abundance of shallow areas, rich in submergent vegetation with an area of 114 $km^2$. On the average, the density of wintering waterfowl is 256 species/$km^2$. In this part of the lake, the main number of swans (mute and whooper swans), gray ducks, rufous-crested ducks and Common porchards, tufted ducks, coots, gulls (Caspian, common, Pallas's gulls, etc.) winter. Tufted duck and gray duck are found in small groups in the Balykchy Bay, usually in close proximity to the large flocks of rufous-crested duck. Mute and whooper swans are flocked along the shore from the Ak-Bulun Island to the Balykchy Bay from several species to dozens and hundreds, several dozen wintering along the shoreline of Toru-Aigyr-Chyrpykty. As in the entire coastal stripe of Lake Issyk-Kul grebes are observed in flocks of several dozens, rarely hundreds of species in the western zone. The majority of these birds winter in Balykchy Bay, near the Kara-Bulun Island, the Toru-Aygyr Cape.

Mallard ducks keep around the west shore in small flocks. Most of the rufous-crested ducks and Common pochards winter in the Balykchy Bay or at the entrance thereto, as well as around the Ak-Bulun Island. Rufous-crested ducks are grouped in flocks of up to several thousand species; the flocks of Common pochards consist of a small number of birds.

***Fig.19.*** *The northern shore of the Issyk-Kul Lake (the Toru-Aigyr village), wintering places of waterfowl (photo by A.N. Ostashchenko)*


***Fig20.*** *The south-east shore of Lake Issyk-Kul (the Pokrovka village), wintering places of flamingo (photo by I.V. Turkovskiy)*

***Puc.21.*** *The southern shore of Lake Issyk-Kul (the Jeti-Oguz village), a breeding colony of grey heron (Ardeacinerea) (photo by A.T. Davletbakov)*

***Fig.22.*** *The western shore of the Issyk-Kul Lake (the Ottuk village), a breeding colony of common cormorants (Phalacrocoraxcarbo) (photo by A.N. Ostashchenko)*

***The Eastern zone*** is located within the boundaries of the area from the Chon-Uryukty-Tyup Bay - the Sukhoi Khrebet Peninsula – the Dzhergalan Bay to the Kara-Bulun Cape. The shallow water area in this area makes up 108 км$^2$. It is characterized by large angularity of the shoreline, an abundance of various depths in broadlands, which are usually covered with ice in the second half of November. In the eastern part of the lake, 30% of waterfowl and semi-aquatic birds are located, of which the bulk is represented by rufous-crested duck. In addition to it, European teal, bullhead, a significant part of common pochards, grebes and coots winter here. In the eastern zone a larger number of swans (mute and whooper swans) are observed in comparison with the northern and southern zones. Swans stay here in the proximity of the northern coast of the Sukhoi Khrebet Peninsula, several dozens of species are located along the coast of the Oi-Tal-Kuturg and the Bozbeshik Bay. Rufous-crested duck is concentrating since the autumn in the Tyup Bay. The flocks of mallard ducks, numbering up to several dozens, rarely hundreds of species, are spread mainly along the shore from the Oi – Tal village to the Kuturga village, and in the Bozbeshik Bay. In the area under consideration 25% of grebes winter annually, their main location areas being the Tyup Bay and shallow waters from the Koi-Sary stow to the Bozbeshik Bay.
The northern zone occupies a shallow coastal stripe from the Chyrpykty Cape to the Chon-Uryukty village, its area makes up 151 km$^2$, the bird population density is equal to 65 species/km$^2$ on the average. 20% of wintering birds are located here, which, as a rule, are spreading in the bays. The main places of concentration of swans in this zone are the Chyrpykty-Choktal and Ananiyevo-Chon-Uryukty area.

***The southern zone***, where an average of 10% of the total number of wintering birds is located, embraces the shore part of the lake from the Kara-Bulun Cape to the mouth of the Ak-Terek River, with an area of 105 km$^2$. The bird population density is equal to 61 species/km$^2$. In this zone, the wintering conditions for waterfowl and semi-aquatic birds are

worse: stony or sandy bottom, scarce submergent vegetation. Birds concentrate mostly in the bays, the bulk being concentrated in the Kyzyl-Sui Bay, one of the largest bays of Lake Issyk-Kul. In the southern zone, in separate winters, grey goose, merganser and loot are utterly absent.

At Lake Issyk-Kul and in the shore area there are four species of mammals: Eurasian water shrew, otter, muskrat and American mink. The latter two species were acclimatized in the last century (the years 1944 and 1956). There are also 4 species of amphibians: green toad, Pevtsov toad, lake frog and Central Asian frog.

23 species of birds, 2 species of mammals and 2 plant species have been entered into the Red Data Book of Kyrgyzstan (2005).

## Ecosystem services

Issyk-Kul Lake is included in the number of the largest mountain lakes in the world and it is rightly called the pearl of Central Asia. By water transparency it is the second most transparent lake in the world, after Lake Baikal. The mild winters of the basin and the warmth of water, as well as the salinity of the lake, prevent it from freezing during the winter period.

The wetland serve as a place for mass recreation of people in the warm season. Here is the most developed infrastructure: a large number of health resorts and holiday homes, which receive tourists from many countries. The total number of tourists, who have visited the Issyk-Kul oblast in the year 2016, was 1,159,656 people. On the northern shore there are 102 boarding houses and health resorts, their number on the south bank is 22. Most tourists are concentrated in the Issyk-Kul district (the city of Cholpon-Ata, the village of Bosteri, etc.) – up to 1,1 million people. The Tong district is comparatively less popular - 17,300 people.

Up to 120 tons of fish of various species: Schmidt's dace, pike perch, carp, peled, whitefish, etc. are caught in the lake annually. The lake is one of the Important Bird Areas in Central Asia: shallow waters, water area and its coastal wetland ecosystem are valuable places for migrations, wintering and nesting for more than 240 species of waterfowl and semi-aquatic birds. Issyk-Kul Lake, as a wetland, is of great importance as a reserve of various benefits and services.

## Local communities

The concept of sustainable development of the "Issyk-Kul" ecological and economic system considers the development of the Issyk-Kul oblast as an ecosystem in general, which ensures high quality of the environment, economic growth and welfare of the population. In 2016 the population of the Issyk-Kul oblast has made 330,2 thousand people. More than 2/3 of the population lives in rural areas. The oblast is divided into 5 administrative-territorial districts: Aksu, Jeti-Oguz, Issyk-Kul, Tong, Tyup districts. There are 3 cities: Karakol, Balykchy, Cholpon-Ata, 5 urban-type settlements, 64 ayil okmotus (village government) and 181 villages. The administrative center is the city of Karakol.

In the depths of the Issyk-Kul oblast such minerals as tin, tungsten, uranium, molybdenum occur, there are reserves of bituminous and brown coal. The agricultural sector is also an important branch of the economy: it mainly specializes in the production of grain crops, potatoes, vegetables, fruits and berries, which are exported to other regions of the Republic

and abroad. Only a small part of the total agricultural output is processed in the region: grain crops - 20%, vegetables - 5-6%, fruits - 10-12%, meat - 0.5-1%, milk - 20-25%. The total cultivation area of the oblast makes up 190 thousand ha. The oblast produces 12% of the Republican volume of grain. About 70 thousand tons of grain is grown for nourishment of population, 32,000 tons - for seeds, 50 thousand tons is exported outside the oblast, the remaining part, up to 20-25 thousand tons is forwarded for cattle fodder. The Issyk-Kul oblast remains a major supplier of potatoes, its production accounts for 41-45% of the gross output of the Republic. Potatoes are practically not processed in the area. The Issyk-Kul oblast is rich in fruit and berry crops. 20% of the total area of fruit and berry plantations of the Republic belongs to the Pre-Issyk-Kul region. The output of fruit and berry crops is about 40 thousand tons per year.

In recent years, a tendency for livestock increase is observed in cattle-breeding. The traditional sheep breeding with the priority of meat production is relevantly developing. With an increase in the livestock of sheep and the improvement of their breed composition, an increase in the production of mutton for export is expected in the future. The livestock of cattle is also growing. The breeding industry has become a highly profitable industry in the recent decades and is characterized by a rapid increase in livestock. Dairy cattle breeding acquires an ever-increasing importance in the development of livestock production, milk is one of the main sources of income for population. Milk processing plants play a significant role, they purchase the products from the local population. At the same time, the oblast is a major exporter of the processed dairy products in the form of different types of cheese. The enterprises of the Issyk-Kul oblast, “Ak-Zhalga”, “Sut-Bulak” export up to 50% of the total Republican volume of the export of cheese products.

Rabbit breeding, poultry farming and, strangely enough, fish farming, which is represented by the three fish factories for the cultivation of fries of valuable species (trout, whitefish), are poorly developed. The cage method of fishing, including endemic species, is not sufficiently developed.

Beekeeping is a highly profitable industry. The unique mountain, ecologically pure honey of Issyk-Kul is highly valued. All necessary conditions are available for its development.

Besides, the branch is represented by the production of canned vegetables and fruits, fruit and berry alcoholic products. The products of the processing enterprises of the oblast are supplied to other regions of the Republic and abroad (Kazakhstan, some regions of Russia). In the long term the region has a great potential in increasing export volumes of fruit juices and jams.

Tourism at Lake Issyk-Kul is a kind of socio-economic activity, based on the use of geographical and natural climatic conditions of the region, unique in its composition and combination. Tourism is supported by hosting of tourists in hotels, private hotels and guest houses. There are 53 deposits of mineral-thermal waters of various chemical compositions and deposits of therapeutic mud in the region.

## Wetland value for the local population

Lake Issyk-Kul for a long time plays a special role in the Central Asian region, it is its pearl and the sanctuary of the Kyrgyz people. The wetland is extremely important, and sometimes indispensable for ensuring health and well-being of the people living on or near it. The

wetland of Lake Issyk-Kul is of a special importance as a part of the cultural heritage of mankind, for example, for holding the World Nomadic Games. It is connected with the spiritual values, being a source of aesthetic and artistic inspiration, and forming the basis of the important local traditions of social, economic and cultural nature. Besides, Issyk-Kul ensures the concentration of rich biodiversity.

The results of the questionnaire survey have shown that the population estimates this wetland as a source of water (91%), a habitat and migration place of birds (86%), a resting place (86%), a place for animal and plant protection (66%), hunting and fishing (46%), a source of income and food (43%).

## Assessment of the wetland condition

The use of water for irrigation purposes produces a negative effect upon the fauna of the small rivers of the Issyk-Kul basin. As a result of the regulation of the flows of large rivers, floodplains are becoming degraded, marshes dry up, river floodplains disappear, river beds are leveled due to heavy rains and increased melting of glaciers; in summer, the unconfined flood waters lead to numerous destructions. Water pollution with the industrial and domestic wastewaters occurs in the Issyk-Kul basin, they are often discharged into water bodies without any cleaning, or the purification facilities do not provide the proper quality of treatment.

The introduction of alien fish species into the reservoirs creates a threat of extinction of the native species. Despite the fact that the use of floodplain forests for obtaining timber is prohibited by law, illegal cutting of trees and bushes, alongside with grazing, lead to their degradation.

A polling survey among the local communities has shown that tourism produces the most positive effect on the wetland (86%). The negative effect is produced by drainage - 66%, introduction of animals and plants - 51%, enhancing of cattle-breeding - 63%, construction of new enterprises - 57%, mining - 43%.

## Ecotourism

Issyk-Kul Lake is one of the favorite places both for local and foreign tourists. The most popular places among tourists at Issyk-Kul are the towns and villages of the northern shore: Cholpon-Ata, Bostery, Sary-Oi, Chon-Sary-Oi, Tamchi, and of the southern shore - Kaji-Sai and Tamga villages. The length of the beach zone is about 600 km, more than 120 km of which are natural beaches (of the 1st and 2nd categories). More than half of the beach zone is occupied by accumulative straightened shores, composed of sands, small and medium pebbles, and, to a lesser extent, boulders. Most of the tourists are the residents of Kyrgyzstan, Kazakhstan, and Russia. According to the statistics, Issyk-Kul receives about 1 million tourists per year, and about 30-40 thousand foreign tourists come from abroad.

The infrastructure is highly developed: there are many boarding houses and health resorts, which accept tourists from many countries. On the northern shore there are 102 boarding houses and health resorts, and on the southern shore their number is 22.

The Issyk-Kul State Nature Reserve by its status is a regional scientific research and protection institution. Besides, the shallow part of the water area with its shore wetland

ecosystem is the most important wintering, migrating and nesting area for waterfowl and semi-aquatic birds.

***The potential benefits of this wetland include:***

- *increase of the attractiveness of the lands in ecologically clean zones for the arrangement of health and tourism facilities*
- *attraction of additional incomes and investments due to the development of ecological tourism, expansion of the employment opportunities for the local population*
- *economic benefits due to the improvement of health of population in the clean environment around the SPNT (reducing the costs of the population for medical treatment, increasing people's productivity by reducing the days of illness, etc.)*
- *receiving grants for biodiversity conservation*

## Conclusions on the work with the local population

The results of the questionnaire survey have shown an interest in the issue of conservation of wetlands. Polling surveys of people of different social status and different age groups have been carried out. The analysis has shown that besides the Internet and television the population is interested in other channels of communication - conversations with the environmental specialists, release of colorful posters, booklets, popular brochures in Kyrgyz language, taking into account the national peculiarities, everyday life, publication of articles in the national newspapers, filming and demonstration of amateur movies.

## Expert's opinion

It is necessary to expand the tasks of protecting and studying the entire natural complex of the wetland, restoring its biodiversity, educating the local population and promoting environmental ideas. It will help to preserve the most typical parts of the lake's wetland complex in its natural state; to continue work for monitoring the number and species composition of avifauna, and to collect the data on meteorological indices of weather and climate in general. Based on the obtained data measures should be developed for the conservation and remediation of biodiversity of the Issyk-Kul wetland.

It is also necessary to intensify the work for the year-round environmental education of the local population and vacationers in the summer period, and for monitoring the flow of the local people and vacationers in the Issyk-Kul oblast. For this purpose, it is necessary to raise the level of material and technical security of the Issyk-Kul State Nature Reserve, to raise the qualification and professional level of both the scientists and gamekeepers, engaging relevant specialists. It is necessary to organize seminars and trainings for security workers, to increase the level of scientific observation on place by constant monitoring over the quality of keeping observation diaries and making phenological cards. It is necessary to constantly increase the awareness of the local communities and their educational level in order to enlist their support and participation in the environmental activities in the region. To do this, one should conduct lectures and conversations in all organizations and institutions of the region, in the rural administrations with a wide coverage in all mass media.

The Management Plan of the Issyk-Kul State Nature Reserve No. 01-9/132 for the years 2016-2021 was developed and approved on 07.06.2017 by the General Directorate of the "Issyk-Kel" Biospheric Territory for the performance of the functional duties of the reserve as a regional scientific-research and protection institution.

The reserve is entrusted with the task to protect and study the entire natural complex of the lake, including its flora and fauna. The main direction is monitoring of waterfowl and semi-aquatic birds. The employees of the reserve issue annual volume of the Annals of Nature, wherein all the results of observations of natural processes, monitoring of the dynamics of the number of animals, phenological observations, as well as the chronicle of scientific, economic and environmental activities of the reserve are registered.

Based on the goals and objectives set in the Management Plan the following results are achieved: the boundaries and area of the wetland were updated, special documents (the Regulations), regulating an economic activity and protection regime were developed; while carrying out the inventory, the types of vegetation and their associations are determined, and the richness of biodiversity was revealed on the basis of the compiled lists of the main types of vascular plants and vertebrate animals, including rare and endangered species.

When assessing the impact of various types of economic activity, it was revealed that the Issyk-Kul wetland has been slightly modified by anthropogenic activities. The types of the use of natural resources (hunting, fishing) are currently carried out to a small extent. In the future, the growth of fishing, especially illegal fishing, may produce a significant negative effect upon the ecosystems of this wetland. Mining of mineral resources also causes a potential threat.

The main directions for Issyk-Kul conservation are determined. The strategy for conservation of its ecosystems is based on the principles of compliance with the volumes of fishing and fishing technologies, environmental standards for the development of the natural reserves.

Economic mechanisms for biodiversity conservation from the anthropogenic effects have been developed. The maintenance of quality monitoring over the state of the natural ecosystems is determined as one of the main priorities upon the creation of an environmental management system. To implement this measure an organizational monitoring scheme has been developed.

An important component of the organization of wise management of the natural resources is the wide propaganda of the conservation of the unique ecosystems and lands, first and foremost, as a vital arena for the local people leading a traditional way of life.

***MP strengths:*** an experience in the practical work for carrying out a scientific research is accumulated; a database of many-years recording of the wintering birds is created; a large educational program is carried out on a regular basis: conferences, seminars, slide shows, video clips, booklets and posters; qualification level of scientific employees is increasing.

***MP weaknesses:*** an insufficient material and technical base; lack of a system of targeted involvement of young professionals; loss of personnel; an insufficient level of financing of scientific research; inconsistency of the team of specialists of the scientific department with the objective priorities of the scientific research activity.

The experience in the creation of the MP has been extended to all Ramsar Sites of the Republic. As it is seen from the obtained results, these sites represent the unique reserves for biodiversity conservation in Central Asia, and they have been slightly modified by human activities.

It is also obvious that serious threats and challenges will arise in these territories in future. To prevent these negative changes, as well as to monitor the state of ecosystems, real actions are required, which necessitate organizational efforts and financial costs. It is necessary to raise awareness of the local population and their educational level in order to enlist their support and participation in the environmental activities in the region, and to participate in the implementation of the MP for wetland conservation.

**Recommendations**

It is necessary to elaborate the norms regulating the number of people and livestock, which, without damage to the natural ecosystems, may be permanently located in the region, to develop a limit for the number of vacationers in the summer period in the shore area of the lake, to regulate the construction of recreational facilities, industries with the emissions, harmful to the environment, to develop methods for remediation of biodiversity of the Issyk-Kul basin.

It is necessary to elaborate a program for developing contacts with the local population and mass media in order to enlist the support of the local and central authorities. This program could include: contacts with mass media; informing and educating the local communities; familiarization of visitors with the protected objects; environmental advocacy; publishing activity. The goal is to convince public in the need to protect wetlands, explaining what to do in order to gain benefits and services, giving the locals the responsibility of the control over the environment. The local communities can and should play a significant role in the management of these wetlands. The goal of the propaganda should focus on the education of a sense of unity and responsibility. The more knowledge is available, the more actively this knowledge will be involved in the matters, related to the protected object and wetlands.

### 3.2.2 Son-Kul Lake

| | |
|---|---|
| ***Name*** | *Son-Kul Lake* |
| ***Registration in the Ramsar List*** | *January 23, 2011* |
| ***Relation to the SPNT*** | *Karatal-Japyryk State Nature Reserve* |
| ***IBA*** | *KG 1943* |
| ***Area*** | *38.869 ha* |
| ***Coordinates*** | *41˚55.03˝ North latitude & 75˚08.32˝ East longitude* |
| ***Administrative belonging*** | *Kochkor, Jumgal, Naryn and Ak-Talaa districts of the Naryn oblast* |

**Brief description**

Son-Kul Lake is located in the intermountain basin between Molodo-Too, Songkel-Too and Boor-Alba ridges at an altitude of 3,016 m. The inmost depth is 22 m, the average depth is 9.2 m, the length is 29 km, the largest width is 18 km, the coastal stripe is 96 km, and the water volume is 2.64 $km^3$.

The climate of the basin is sharply continental, summer temperature reaches 15-18°C, in winter it drops down to 35-38°C. The number of days with snow cover is 180-200 per year. The thickness of the ice cover on Son-Kul Lake can reach up to 1 m. The number of frost-free days is 50-60. The ice cover on the lake is established in the middle of October, shore areas begin to thaw in the middle or at the end of April, during about a month. The ice comes off completely in the second half of May. The nival belt (from 3,500 m) of rocks, snowfields and glaciers is the moisture accumulation belt. Even in the lower part of this belt the mid-July temperatures do not exceed + 4, + 7°C, and the mid-January temperatures drop down to -22°C.

The bottom of the lake is flattened, smoothed. The deep-water zone is somewhat displaced to the northern part of the water area. The eastern part is shallow, a gradual increase in depth down to 4-5 m is observed on the site of 7-8 km from the source of the Son-Kul River, and at a distance of 10-11 km from the source the depth reaches 10-12 m. The relief of the bottom of the western part is characterized by a sharp lowering already at the first 200 m from the water's edge.

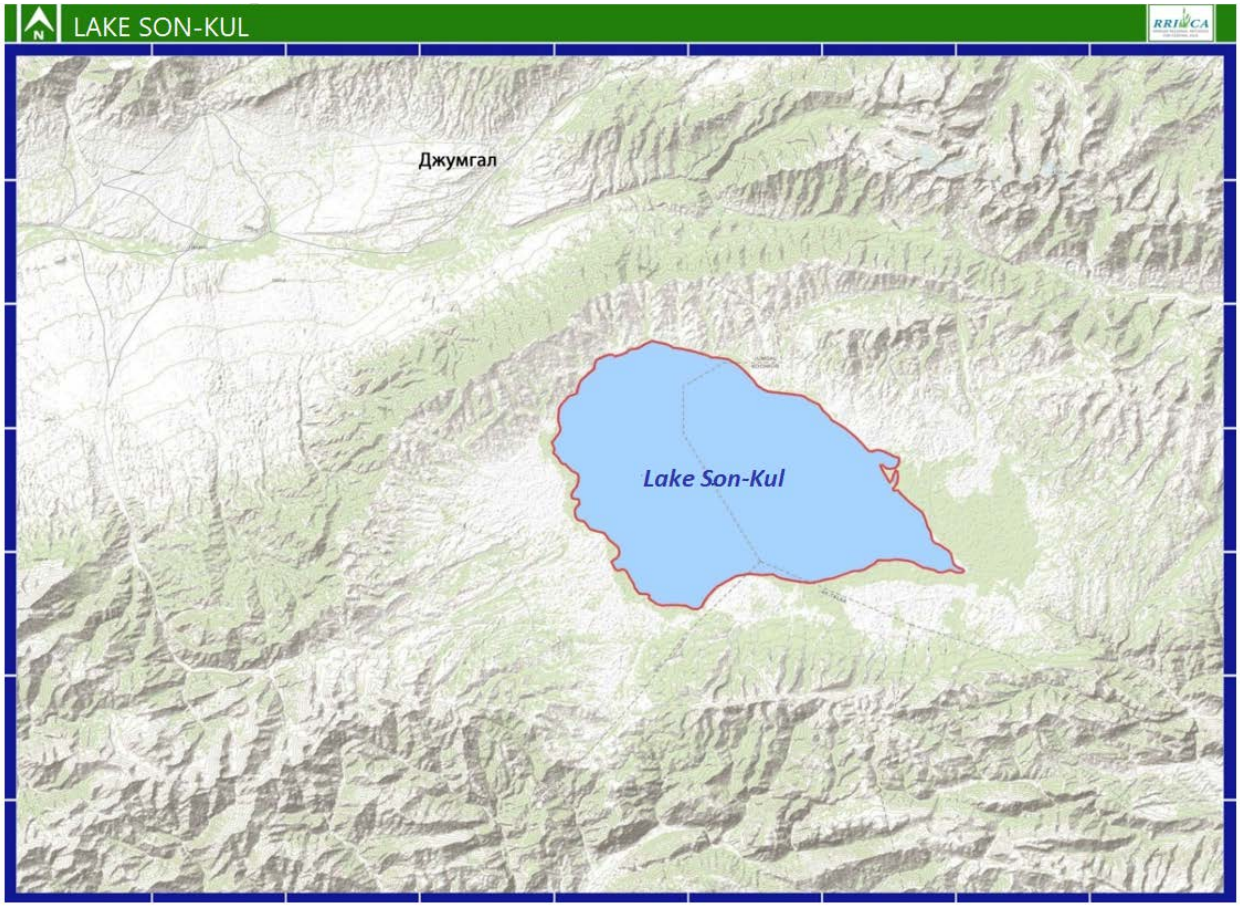


***Fig. 23.*** *Localization of the wetlands of the Son-Kul lake and the site of the Karatal-Japyryk State Nature Reserve*

In the southeast the structural uplifts are “sawn through” by the waters of the lake. Only one river - the unique river Kok-Jerty flows from the lake, which discharge during the intensive snowmelt makes up 3-5 $m^3/s$, at other time it is insignificant. The surface of the fluviolacustrine plain is poorly dissected, which causes a very weak drainage of the underground waters (the depth of the surface dissection rarely exceeds 0.8-0.1 m).

The Son-Kul basin is characterized by a poorly developed network of surface stream-flows and the presence of a significant underground run-off. In total there are 45 water-erosion cuts, depressions, ravines, streamlets and rivulets within the Son-Kul syrts, through which water can pass into the lake. Almost the entire river network in the lake basin is temporarily operational. It is relatively water-saturated only during the periods of snow melt and rains. Only four rivers bring their waters to the lake in the form of a constant stream flow: Kum-Bel, Ak-Tash, Tash-Dobo and Kara-Keche rivers. The basin contains large reserves of underground waters.

***Fig. 24.*** *The eastern shore of the Son-Kul lake (photo by A.T. Davletbakov)*

On the shores of the lake within the lacustrine-boggy plain, swampy areas are polluted by the remains of putrefying vegetation. All natural outcrops of underground waters are used for supplying water to the summer pastures of the Son-Kul depression.

At present, the amplitude of water level fluctuations is regulated by the threshold of the outflowing river and does not exceed 100-150 cm. Its maximum stream flows are, as a rule, of mixed origin from rain and melt waters, with the dominant role of the latter. The low-water period occurs in the cold season, when melting processes fade and the river runoff is formed due to underground waters. The low-water period is characterized by relatively stable and low water consumption. The long-term average turbidity of the rivers is 100-2,560 $g/m^3$.

The south-eastern part of the lake (its area is 36,449 ha) belongs to the Karatal-Japyryk State Nature Reserve, which was created in 1994 to preserve the unique natural complexes, rare species of animals and plants of the Inner Tien Shan. It is located in the territories of Naryn, Ak-Talin, Kochkor and At-Bashin districts of the Naryn oblast. The territory of the reserve consists of 3 remote sites.

The Son-Kul site - the total area is 36,869 ha, 27,961.8 ha of which is the water area, and the land area – 8,907.2 ha. The site is 110 km away from the administrative center of the Naryn Reserve. There is a motor road from Naryn to Son-Kul with 2 mountain passes: Zhon-Blak (2,700 m) and Teskey-Torpo (3,030 m), and from the Ak-Talaa district through the Moldo pass (3,050 m), from the Kochkor region through the Kalmak-Ashuu pass (3,400 m), from the Jumgal district through the Kara-Keche pass (3,432 m). The moto transport does not function from November to May due to significant snow precipitation.

According to geobotanical zoning the reserved areas belong to the Asian desert region of the Inner Tien Shan province, Suussamyr belongs to the Karakudjur region, Son-Kul district - meadow-steppe area with the fragments of saz steppe (Son-Kul Reserve zone). Middle Naryn region, Pre-Naryn district – semi-desert area with the fragments of forest-meadow (Karatal, Acha-Tash protected areas).

Arid vegetation. Steppes. In the conditions of dry and sharply continental climate of highlands, cryophytic steppes, covering the ancient terrace of Son-Kul Lake, are widely spread. Cryophyte associations are characterized by the predominance of xerophytic microthermal turf grasses. Fescue-feather grass steppes are most widely spread in the lake basin.

Swamp vegetation is widely spread in the eastern part of the Son-Kul basin. In the Central Tien Shan bogs are more common in highlands than in lowlands. The most significant massifs of moss and sedge-moss bogs are found in the eastern part of Son-Kul Lake. In the eastern part of Son-Kul Lake the shore is covered by the Carexpamirensis associations, framing the lake. Just from the water edge marshy, impenetrable swamps arise, which consist exclusively of green moss (Aulacominumpalustre, Bryumventricosum, etc.). Further from the shore, on higher elevations closer to the mountain slopes, moss bogs are replaced by sedge-moss ones (Polytrichumjuniperinum, Tortularuralis, etc.). Sedges are widely spread (Carexmelanantha, C.oxyleuca, etc.). Still further from the lake, on higher elevations, the sedge-moss bogs are replaced by moss-cobresia-sedge hillock bogs (Carexmelanantha, C.Oxyleuca, S. Stenocarpa Cobresiacapilliformis).

An increase in livestock, belonging to the local population of the border areas and a haphazard use of pastures, have resulted in increasing of weed areas. In the buffer zones there is a change of typical natural grain, sedge plants, prevailing in the past, for other plants, which are not used as cattle fodder.

The list of birds, observed at Son-Kul Lake, numbers 131 species, of which 34 are nesting species, and 3 species are likely to nest. Another 11 species nest in the vicinities and use the territory adjacent to the lake as feeding stations. 17 species of birds, inhabiting the area of Son-Kul Lake, are listed in the Red Data Book of the Kyrgyz Republic (2005).


***Fig. 25.*** *The eastern shore of the Son-Kul lake, a breeding colony of sea-gulls (photo by I.V. Turkovskiy)*

## Ecosystem services

The wetland ecosystems play a very important role in the ecological and economic stability of the area. Most of the considered wetlands are used for pasture. The lands are used productively for cattle breeding. Milk and meat dominate in the branch, due to the availability of large pastures. Horse meat also takes a leading position among the products at the market, as a large number of horses are used in different directions of agricultural activities. An increase in the number of livestock owned by the local population and haphazard use of pastures result in an increase in weed vegetation. In buffer zones a change of typical natural grain, sedge plants, prevailing in the past, for other plants, which are not used as cattle fodder, is observed. Nevertheless, the condition of vegetation in such areas is considered as satisfactory, despite the fact that in most areas a significant unauthorized grazing takes place. Accounting for the fact that the territory of the reserve is located in the densely populated areas, it is very difficult to prevent cattle from passing into its territory.

For the tourist service, an appropriate infrastructure is being developed, where a significant part of the local population is involved. The lake basin is traditionally used by the residents of the adjacent areas for various cultural events and celebrations. The Son-Kul Lake has a high tourist potential for development, which is facilitated by the following factors: the nature of high mountain lake, which is not affected by human activities, clean air, culture, customs and, in general, the way of life of the local communities. The traditional way of life of the local people, and a national yurt with its decoration are of a particular interest to foreign visitors.

The region is included in the integrated tourist routes of the Great Silk Road. Here is one of the most favorable places for the development of eco-tourism. These are remarkable landscape objects, which are of a great interest to tourists. Son-Kul Lake is open for visits in summer from May to September, the largest number of visitors falls on July-August.

For the local residents, who host tourists, there is a number of advantages: financial income, raising the educational level, an opportunity to simultaneously conduct traditional economic activity. In the adjacent territory transhumance is practiced, cattle breeders appear at the end of May and move off towards the end of October, they graze mainly sheep and horses, and to a lesser extent, cows and yaks. The production of koumiss is developed, which is used not only for own consumption, but also for sale.

In the last century, more than a dozen alien species of fish were introduced into the reservoirs of Kyrgyzstan. The previously fishless Son-Kul and Chatyr-Kul lakes were stocked-up with fish. Some of fish species have become commercial, although the total catch is insignificant. Annually 40-50 tons of fish of different species is caught in Son-Kul Lake. Outside the reserved area fishing is managed by the Son-Kul fishery under the Fisheries Department of the Ministry of Agriculture of the Kyrgyz Republic. Two types of the introduced fish, fera and peled, are of commercial importance. The products in the form of fresh fish are delivered to the domestic market.

## Expert's opinion

The studies have shown that the population is not fully aware of the wetland, its significance and role. The level of environmental knowledge of the population is still low. One of the most important tasks is to attract the local people to cooperate in the environmental protection.

There is no special program for tourism, but it is desirable to publish booklets about the wetlands of the region in order to inform the local population. Posters and booklets for schoolchildren will be especially useful.

## Local communities

The population of the Naryn oblast in 2016 made up 227 people. The main activities of the population are cattle breeding, folk craft, services for tourists. Fish farms and farm households are engaged in fishing. The production is represented by fresh and cooled fish.

Upon the organization of the Karatal-Japyryk State Nature Reserve in 1971 an error was made: bar-headed geese, which main nesting sites are located in the protected area, after bringing out nestlings move beyond the boundaries of the protected area. The main feeding areas for bar-headed geese are located at the southern and western shores of the lake. The main shedding places of adult geese are also situated here. This omission has led to the fact that the bar-headed geese are outside the protected area in the most vulnerable periods of their life.

As a result of the introduction of fish into the lake, the reserves of invertebrate hydrobionts, which served as the main food for wetland birds, have significantly decreased. The use of nets for fishing has resulted in a significant reduction of underwater higher vegetation. And if before the commercial fishing all bottom of the lake was covered with algae thickets, which reached several meters, now only small areas of underwater vegetation are preserved. This has significantly reduced food resources for wetland birds. The introduction of fish has

resulted, on the one hand, in an increase in the number of fish-eating species of birds (great-crested grebe, cormorant, grey heron, Caspian gull and great black-headed gull); on the other hand, stocks of aquatic invertebrates, which served as the main food for horned grebe and black-necked grebe, reduced as well as the number of ducks gathering for shedding. Fishing in summer also leads to the death of wetland birds, entangled in networks.

Unfortunately, illegal fishing is widespread. Besides, catching of nestlings of molting birds is practiced. The presence of numerous swimming devices on the lake, which have no state registration, makes it difficult to carry out anti-poaching operations and significantly increases anxiety. High concentrations of cattle lead to exhausting of pastures and degradation of vegetation. This contributes to wind and water erosion, changes in the species composition of vegetation. Bird clutches and nestlings are dying under the hoofs of domestic animals. The shepherd camps, located on the shore of the lake outside the protected territory, deprive the bar-headed geese of the opportunity to come ashore for feeding.

During the summer period, cattle-breeders of Jumgal, Kochkor, Ak-Talaa and Naryn districts stay at the Son-Kul jailoo (summer pastures) from the beginning of May to October for the purposes of cattle-breeding and tourism. The population is engaged in breeding horses, large and small cattle. There are no outside land users in the protected area. Outside the buffer-border area, about 200 shepherds of farm households from Kochkor, Naryn, Ak-Talaa districts are engaged in cattle breeding.

**Value of the wetlands for the local population**

Son-Kul Lake provides the conditions for the development of fishing, cattle breeding, recreation and tourism. In order to develop the rational use of pastures, pasture committees are being established. In the remote rural areas the facilities for processing the products of cattle-breeding and plant growing, such as potatoes, cabbage, cucumbers and other vegetables, are organized. The local population is trained in agro-technical skills and sustainable technologies, for example, energy-saving technologies. Nevertheless, because of the continuing land degradation the ability of ecosystems to provide goods and services for population is decreasing.

In the research aspect the work is underway to create registers and a database, aimed at preserving the knowledge, related to the use of natural dyes in the manufacture of felt products. The work is underway for breeding yaks on highland pastures and a local breed of a mountain horse on the basis of the traditional experience and knowledge. The traditions of careful use of pastures are being revived. The local enthusiasts have started growing the ancient Kyrgyz breed of dog – taigana.

Besides, the Son-Kul area is the bearer of a part of the cultural heritage, for example, the monuments left by the troops of Manas (“Tash Tulga”) (“Nine Hearths”). It is connected with the historical and spiritual values, it is a source of an aesthetic and artistic inspiration, contains invaluable archaeological evidence, and forms the basis of important local traditions of social, economic and cultural nature.

The participants of the sociological survey have assessed the value of the wetlands as a source of income - 53%, a source of water - 53%, a place for the protection of animals and plants - 46%, a habitat and migration place of birds - 46%, a source of food - 28%, a hunting and fishing place - 21% and a place of recreation of the population - 54%.

***Fig.26.*** *The yurt town for tourists at Song-Kul Lake (photo by A.T. Davletbakov)*

## Assessment of the wetland condition

Son-Kul Lake is unevenly protected within its different parts. This fact is especially disturbing in connection with the existing practice of illegal fishery. At the same time, public and scientific organizations are actively working to substantiate a creation of a representative SPNT network in the area. First of all, it is necessary to consider the task of conducting a systematic inventory of all components of Son-Kul biodiversity in terms of significance for maintaining its integrity, water balance and system of hydrological regulation. It is necessary to take targeted actions for the conservation of populations of mountain geese, migratory birds, and coordination of basic conservation activities during the nesting period. A sociological survey of the local population has shown that the greatest positive effect on the wetlands is produced by tourism-46%, the negative effect is produced by mining - 31%, desertification - 28%, construction of new enterprises - 29%.

## Ecotourism

The total number of tourists, visiting Son-Kul Lake in 2016, was 270 thousand people. The yurt towns of 5 tourist companies are located on the northern shore. On the southern shore there are also yurt towns of 3 travel agencies. The hiking ecological trails, as well as car and bicycle routes have been developed. The shows of national games, for example, horse racing, kok-bor (goat dragging game), kyz kumai (catching up with a girl), etc. are being organized. The processes of installation and dismantling of yurts, ancient dwelling of nomads, is presented for tourists. The local women make and sell products, manufactured of felt. Provision of tourism services is an alternative type of activities for the population. The provision of services here is the second largest after that at Issyk-Kul Lake. Tourists have a

couple of months to visit Son-Kul Lake: from September to June the lake is covered with ice. It is this place where shepherds bring cattle, build up yurts. These places are being used as a jailoo from ancient times, as it is evidenced by the rock carvings.

## Conclusions on the work with the local population

As the questionnaire survey has shown, the local population is interested in acquiring ecological knowledge. Therefore, one of the most important tasks is to involve the local communities in the protection of the wetland. The reserve has an insufficient number of literature and methodological developments for working with the local communities. It is necessary to strengthen the work for eco-education, to create a library. This will allow one to arrange a stable systematic work with the local communities and public at large, to engage them in active support of the reserve's activities, to find new forms of interaction with the population, to cultivate in them a careful conscious attitude to nature. It is desirable to publish booklets about the wetlands of the region in order to inform the local population thereof. Posters and booklets for schoolchildren will be especially useful.

The results of the questionnaire survey of the local population have shown that the propaganda work with the residents of the neighboring reserves or national parks requires a special attention. It is necessary to pay more attention to improving relations with the local residents, to take measures for ensuring support of the wetlands on their part. It is necessary to develop on a system level a program for developing contacts with the local population and the mass media in order to provide the local and state support for the protected area. This program could include: contacts with the mass media; informing the society and educating the public; familiarization of the visitors with the protected objects; environmental advocacy; publishing activity. The SPNT staff, in this case the staff of the Karatal-Japyryk State Nature Reserve, should be trained in the methods for disseminating information, carrying out environmental propaganda and preparing the materials for mass media. The purpose of this activity is to convince the local communities in the need to protect wetlands, to explain them how to do this, to get support from the local residents and to create an atmosphere of a constant concern for the reserve management.

Unfortunately, as it has been shown by the survey data, the work, which is being carried out with the local population, is insufficient. It has turned out that many people have only superficial knowledge about the wetlands. It is necessary to conduct a systematic study of the efficiency of the advocacy activities based on the protected natural areas. The local community should play a big role in their management. The purpose of propaganda should aim at cultivation in them a sense of responsibility for the wetlands. The more knowledge is available to them, the more actively they are involved in the process.

It is possible to take an example as it is done in a number of foreign national parks, for example, the Yellowstone National Park: to put up the work plan of the park for the next month at a certain place, and to distribute it among the local population through press releases. Everyone has the right to make suggestions. This promotes mutual understanding between the administration of the protected object and the local population. It is desirable to involve the local residents in the protection of the reserved area, scientific work, and maintenance of ecological trails.

MP of the Karatal-Japyryk State Nature Reserve No.01-9/173 has been approved on 24.06.16.

The main objectives are: to preserve unique, freshwater mountain lakes, rich gene pool, biodiversity, grassy ecosystems of middle mountains and highlands - habitats of rare and endemic species, maintenance of natural processes and ecosystem, remediation of the previously depressed pasture areas, ensuring natural reproduction and restoration of the population of bar-headed goose, Karelin Tien Shan arkhar, carrying out monitoring of the success of biodiversity management by the state of indicator species and communities, and promotion of public awareness and education on biodiversity issues in order to ensure support and participation of the local community in management tasks.

At all sites of the reserve there is no buffer zone, intensive grazing of cattle, active economic activity is carried out. This leads to a disorder of the ecosystem of the protected area. The Naryn Forestry directly adjoins the reserve. Patrolling of the territory and control of poaching are poorly carried out. Near the core zone of Karatal site, where the migration area of the Karelin Tien Shan arkhar is located, wood cutting takes place, which produces a negative effect and causes irreparable damage to the fauna and flora. Despite the introduction of moratorium, fishing on motor boats is carried out on Son-Kul Lake. This factor of anxiety produces a negative effect upon nesting of bar-headed goose. Consecutive draughts and presence of the grass cover in dry years contribute to the occurrence of fires.

**The management of the reserve faces a number of problems:**

- *Imprecise selection of the priority control objects, the lack of management planning for separate objects. The current state of the priority objects for conservation of the flora and fauna of the reserve is insufficiently studied. There is a need for ranking the objects of conservation and identification of the groups and species, which existence in the reserve is not threatened;*

- *It is necessary to identify the species and communities that are threatened by certain circumstances and for which special protection measures should be developed. These studies are needed to specify the management of biodiversity, which will make it possible to identify the most valuable areas, where their integrated protection is possible, as well as to determine the periods of the year, which are most significant for breeding of species;*

- *The short-stuffing and lack of qualified specialists and advanced training, a low level of communication networks: there is no communication between the employees inside and outside the reserve;*

- *Insufficient number of cordons for seasonal and year-round patrolling, insufficient budget financing of scientific research. A decrease in the quality of the scientific work, outflow of highly qualified scientific personnel due to the difficult material and social situation of the reserve;*

- *Unavailability of fire-fighting equipment and appliances;*

- *Lack of skills of the personnel in terms of the work with the local population on the issues of environment protection of the reserve in the current economic situation;*

- *The existing boards and notice plates are outdated and have not been updated for a long time. Many of them do not meet the required standards (they are not installed in proper places; poor quality paint and poor-quality material is used for their manufacturing). The local community draws only a small benefit from the creation of the reserve due to the limited use of natural resources.*

In the long run, to ensure the stable existence of the wetlands and sustainable nature management, it is necessary to solve a number of problems and tasks: **(1)** Improvement of the regulatory and legal framework, which ensures the conservation of the wetlands. **(2)** Study and regulation of the recreational load. The need to solve this problem has become significant in recent years. It is supposed that it will be possible to solve it in the frames of ensuring the functioning of the Biospheric Reserve with participation of the guard personnel of the Karatal-Japyryk State Nature Reserve. **(3)** The territory of the wetland should not be a place for poaching fishing. The main activity direction should be the protection and effective regulation of the use of natural resources. This requires an appropriate level of governmental funding, that is why the problem cannot be resolved at the oblast level.

Besides, one of the problems of the wetland existence is the lack of the integrated monitoring of these territories, their functional zoning and plans of sustainable use. The state of the wetland and the success of nesting of water and semi-aquatic birds are adversely affected by fires, unregulated grazing, which causes degradation of plant communities and reservoirs, as well as by the loss of wild animals from loose dogs, the use of net fishing, a high level of poaching, indifference of the local population to solving the problems.

Based on the conducted analysis of the condition of the wetland, the following has been identified as most important elements in the MP: the main directions and problems of the biodiversity inventory, the need to create a centralized system of ecological monitoring, the functional zoning of the territory, taking into account its environmental and economic significance, advocating the ideas for wetland conservation and involvement in the wetland management system of the economic entities and local population, development of a plan for cooperation with international organizations. The MP represents an aggregate of scientific studies of the territory and interpretation of the results, obtained in the form of specific recommendations for the practical use of each natural complex. It includes characteristics of the peculiarities of the territory, a description of valuable and threatened ecosystems, an analysis of their sustainability, the location of the reserve in the system of the protected areas in the region, and an analysis of the cultural and socio-economic characteristics of the territory. The objectives of functioning of the protected natural area, the tasks for ensuring the regime of sustainable nature management have been defined. The Management Plan has been coordinated with the State Agency for Environmental Protection and Forestry (SAEPF) under the Government of the Kyrgyz Republic.

The educational work of the reserve embraces various segments of the population, mainly young people. The main forms and methods of educational activities are as follows: an annual participation in the international environmental action “March of Parks”, annual olympiads and quizzes among the schoolchildren for the best connoisseur of the flora and fauna of the reserve; contests and exhibitions of children's drawings, etc. Every year the staff

of the reserve on the World Wetlands Day carries out activities on Son-Kul and Chatyr-Kul lakes to clean the territories of domestic garbage together with the local population. Within the frames of the International Environmental Campaign "March of Parks" planting of seedlings in the territories of schools of the villages adjacent to the reserve, contests for best drawings and essays on environmental themes, quizzes, games, excursions to the Reserve have been carried out.

Taking into account the experience of the past years and changed social and economic conditions, it is necessary to create a nature museum to raise the awareness of the population, tourists and other visitors of the rich and unique nature of the reserve, to increase environmental awareness among the population, to engage it in the environmental activities, to conduct corresponding classes, trainings. The reserve has an insufficient number of literature and methodological developments for working with the local communities. The employees of the reserve have faced the fact that the experience, information does not accumulate. There is no place where it would be possible to conduct regular trainings of the population, where visitors could come and receive the necessary information on the reserve.

## Recommendations

First of all, it is necessary to carry out a systematic inventory of the entire Son-Kul biodiversity in terms of developing measures for its conservation, as well as the maintenance of the wetland, as a system of hydrological regulation and preservation of the functional integrity of the entire ecosystem. Large-scale measures should be taken to conserve populations and habitats of the nesting and migrating birds.

***Besides, the following is required:***

- *provision of a regulatory and legal framework at the regional, national and international levels*
- *coordination and implementation of a unified environmental policy*
- *development and implementation of specialized conservation programs for rare species*
- *justification and implementation of model projects for sustainable development of the area, nature management and conservation of biodiversity*
- *organization of campaigns for environmental education, initiatives for public relations, education and rising awareness of population*

It is necessary to restore natural ecosystems on the territories subject to economic impact and to ensure natural reproduction and restoration of the main conservation object - the population of bar-headed goose and Karelin archar, as well as other objects. Based on the existing threats, it is necessary to carry out the following measures for the management of the reserve resources: remediation of natural vegetation in the degraded areas; creation of a database, since all data related to the biodiversity of the wetlands is disparate, non-uniform, its availability is limited. This makes it difficult to use the available information and its further accumulation. Traditional ways of collecting and storing information do not meet modern requirements for managing biodiversity and wetlands in general.

The database for wetland management should be adapted for collecting and providing the following information: faunistic and floristic information; thematic maps, monitoring data, information on the management decisions and activities, migration routes and movements within and outside the reserve, a number of animals retained by poachers and the impact on

the population, maintenance of the "Nature Annals", meteorological and phenological observations.

### 3.2.3. Chatyr-Kul Lake

| | |
|---|---|
| ***Name*** | *Chatyr-Kul Lake* |
| ***Registration in the Ramsar List*** | *November 8, 2005* |
| ***Relation to the SPNT*** | *Karatal-Japyryk State Nature Reserve* |
| ***IBA*** | *KG 1588* |
| ***Area*** | *16.100 ha* |
| ***Coordinates*** | *40°22″ and 40°32″ Northern latitude, 75°52″ and 75°71″ Eastern longitude* |
| ***Administrative belonging*** | *Naryn oblast, At-Bashy district* |

**Brief description**

Chatyr-Kul Lake is located in the western part of the Ak-Sai Valley at an altitude of 3,530 m. The water area is 161 $km^2$, the length of the lake is 23 km, the width is 18 km, and the depth is down to 19 m. The lake is framed by the At-Bashy ridge in the north and the Torugart-Too ridge in the south. The shores are mostly flat, being at a distance of 3-6 km from the foothills of the ridges. The total area of the reserve makes up 22,344 ha, including 16,100 ha of the water area and 6,244 ha of the land area.

The Chatyr-Kul site of the Karatal-Japyryk State Nature Reserve is located at a distance of 250 km from its Administration in the city of Naryn. There is a road from Naryn with 2 passes: Sary-Bel (2,500 m) and Tuz-Bel (3,500 m), motor transport communication functions all the year round.

The Chatyr-Kul basin as a whole is characterized by the relief of the slightly dissected fluviolacustrine accumulative plain. The bottom of the lake has a hummock-and-hollow structure. The shores, consisting of 6 terraces, are mostly low, and marshy in the south and east. But in the northern part, where the rocks come up immediately adjacent to the water's edge, the shores are high and look like abrasion scarps. Soils are represented by light gray and yellowish carbonate loams with a high content of organic constituents. In the dark gray (to black) silts of the deeper layers, the content of hydrogen sulfide is marked.

The waters of the lake are characterized by low mineralization, related to the chloride-hydrocarbonate-sodium-magnesium type. The total mineralization of water is within the range of 0.5-1.0 g/l. The water color is yellowish green, transparency is up to 4 m, and salinity is 2%. The water temperature in summer is $10^0$C, and at a depth of 0.6 m - down to $4.4^0$ C. The water balance of Chatyr-Kul Lake is negative due to considerable evaporation from the water surface. The water is characterized by deficiency in oxygen, especially at a depth of more than 10 m. The lake freezes in October and melts at the end of April. The ice thickness is 0.25-1.5 m.

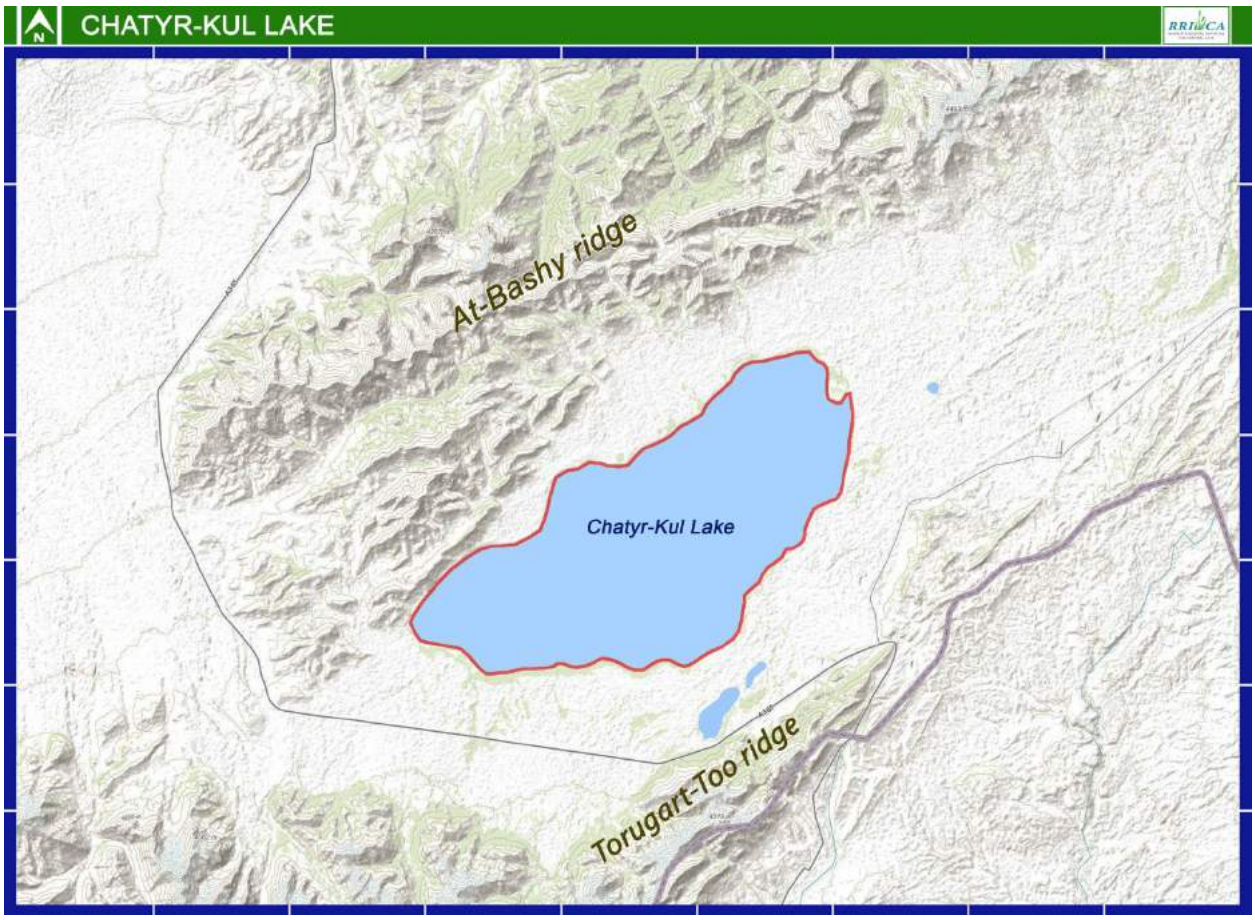


***Fig 27.*** *The Map of the Biospheric Territory of the Chatyr-Kul Lake*

Due to insignificant development of contemporary glaciation in the mountains, the river network is poorly developed. About 41 small rivers flow into the lake, the largest of them are Kara-Suu River with the length of 17 km, Kara-Tai River, with the length of 12 km and others, but only Kek-Argyn River, with the length of 19 km, has a permanent stream. In winter riverbeds freeze to the bottom. Many mineral springs are located in the south-eastern part of the lake.

According to the geobotanical zoning the area belongs to the Asian desert region of the Inner Tien Shan province, the Ak-Sai valley belongs to Upper Naryn region, Chatyr-Kul lake belongs to Ak-Sai meadow-steppe region.

Arid vegetation. Deserts. These are cryoarid varieties of deserts, which are typical to the area near the lake and are confined to the terraces and adjoining adyrs. The grass canopy is sparse. Projective cover makes up 15-20%. Salt efflorescence is on the soil surface. Here is a high abundance of Salsolacollina. Hordeumbrevisubulatum, Potentillahololeucum, Festucakryloviana, Artemisiaviridis, Taraxacumsyrotum, Drabasybamrlex, Oxytropispulvinata also grow there. Wormwood deserts are more widely spread: large massifs of Artemisiarhodantha are located near the lake. Steppe grasses are characterized by Festucakryloviana, Stipasublessiliflora, S.Purpurea (the Central Asian species), Poalitvinoviana; from the sedge family - Carexstenocarpa; from herbs - Potentillamoorcroftii, Androsacesericea, Dracocepalumpausenii.

The vegetation of high-altitude steppes is not distinguished by dynamism, which is characteristic of low-mountain and middle-mountain steppes. Festucakryloviana and Puccinella Hackelliana dominate here most often. The monodominant (Puccinella Hackelliana) steppes are formed on clay and saline soils, coming into direct contact with high-mountain fescue-ptilagrostis steppes, and wormwood deserts here and there with the sections of bare saline soil. The floral composition is not rich, numbering dozens of species, and is not very specific, since the species, which form it, are also found in other high-mountain communities.

In the south-eastern part of the lake a large area is occupied by marshy, impenetrable swampy places. Marshes in these places are hillocky, with various sedges growing on hillocks, intertwined with green mosses. In addition to them here are found Festucatianschanica, Primulaalgida, Leontopodiumochroleucum, Colpodiumaltaicus, etc. To the west from the lake swamps are found on smooth syrtous sections, but they do not occupy large areas. They are confined to river floodplains, they are also hillocky, with sedges, green mosses and some species of dicotyledon plants growing on hillocks, Myriophyllumspicatum, Potamogetonpectiniformis, Ranunculusnatans, etc.

Cryophilic cushion plants are distributed unevenly: in the western and southern parts of the Chatyr-Kul syrt. Dryadanthatetranda represents a powerful edificator of cryophylic cushion plants. Its cushions reach 150-170 cm in length and more than 100 cm in width, and its height does not exceed 5-10 cm. Peaty Alpine meadow or high-mountain polygonal tundra-like peaty soils are formed under cushions. Tree and shrub vegetation in forest-meadow-steppe belt is mainly represented by Schrenk's spruce, Turkestan juniper, heteropodal barberry, Caragana jubata and Lonicera karelinii.

In the northwestern part of the basin, high-mountain grasses are widely spread. The northern part is characterized by grass-saltwort communities, and the eastern part – by high-mountain grass steppes. The floristic composition of associations is poor, the grass cover is low (6-15 cm). In the southern part of the basin considerable areas are occupied by herb-bunchgrass steppes. The floristic composition of the communities is rich in comparison with the eastern part.

Chatyr-Kul is the main habitat and a place for concentration of the Tien Shan population of mountain geese (Eulabeia indica). At the same time, the lake is located on the flyway of other waterbirds. The fish fauna is poor. In the Kek-Argyn river, there are Tien Shan char and such rare endemic as Severtsov's osman.

## Ecosystem services

Being located high in the mountains, the lake justifies its name – the "heavenly lake". It is the third largest lake in Kyrgyzstan. However, shoreline sections are marshy and hardly suitable for tourist camps. In the proximity of the lake in the south-eastern part an underground balneary of Narzan is located, local residents and tourists come here for the medicinal water.

Potential benefits for the local population include: increasing attractiveness of lands in the ecologically clean areas for recreation and tourism facilities, drawing additional revenues and investments through the development of eco-tourism, expanding employment opportunities for the local population, obtaining grants for biodiversity conservation.

## Local communities

The population of Naryn oblast made up 227,5 thousand people in 2016. The wetlands of Chatyr-Kul Lake provide the conditions for the development of cattle breeding, but no permanent population is present. In the warm period of the year the population is represented by cattle-breeders. A network of roads has been developed to ensure the passage of motor transport all the year round. In the territory adjacent to the lake transhumance is practiced. Mainly sheep and horses, and, to a lesser extent, cows are grazed.

***Fig.28.*** *The nest of bar-headed goose (Eulabeia indica) with an egg-clutch at the Chatyr-Kul Lake (photo by A.T. Davletbakov)*

***Fig.29.*** *Nesting places of bar-headed goose (Eulabeia indica) at Chatyr-Kul Lake (photo by A.T. Davletbakov)*

## Value of wetlands for the local population

There is production of koumiss, used for own consumption and sale. In summer, tourism is increasingly developing on the lake, although it is not yet developed enough. An adequate infrastructure for tourism, in which a large part of the local population could be involved, is not available. The territory is traditionally used by the residents of the adjacent areas for various cultural events and holidays.

The lake has remained practically the only high mountain lake not only in Kyrgyzstan, but also in the Central Asian region, almost unaffected by an anthropogenic impact (except for the motor road along the shore connecting Kyrgyzstan with China). Due to the severity of the high mountain region the wetland is extremely vulnerable and unprotected against the human economic activity, and its rehabilitation will take several decades.

The value of the wetland has been assessed by the survey participants as a place for migration of birds (84%), a place for biodiversity protection (61%), a source of water (61%) and food (23%), a source of income (60%), recreation facilities for people (14%). %), hunting and fishing (7%). The wetland is being conserved not only as the habitat of birds and other components of biodiversity, but also as a water reservoir, a productive ecosystem, regulator of water regime and climate. The territory, adjacent to Chatyr-Kul Lake, is also used as a pasture.

***Fig.30.*** *The southern shore of Chatyr-Kul Lake (photo by A.T. Davletbakov)*

## Assessment of the wetland condition

The analysis of the residents' survey results has shown that the majority of respondents believe that the greatest positive effect upon the wetland is produced by tourism - 48%, the negative effect is related to the construction of new enterprises - 80%, mining - 70%, silting - 52%. According to the respondents, the shoreline clean-up measures are rather often on the reserved site – 95%. Besides, 55% of the respondents have noted that positive changes have taken place over the past 10 years. The hunting guards service is well maintained, sufficient attention is paid to the protection of biodiversity on the part of the State. The issues of wetland protection are covered in the mass media. As our studies have shown, the local population would like to receive more information.

## Ecotourism

Chatyr-Kul Lake, like Son-Kul Lake, has a tourist potential for development, which is facilitated by the following factors: the nature of the high mountain lake, which is not affected by human activities, clean air, culture and customs of the local population. The Chatyr-Kul Lake is one of the favorable places for the development of tourism - acquaintance with the local sights, life and games of nomads, historical monuments, etc. The lake is on the tourist route of the Great Silk Road, which determines its inclusion in international tourist routes. Though, unfortunately, services and infrastructure for eco-tourism remain at a low level.

## Conclusions on the work with the local population

All surveyed respondents in one way or another are interested in wetland issues. Accordingly, those people, who wish to receive from the experts as much information as possible, express also their suggestions. The population living in small remote villages and towns is not widely influenced by the popular mass media: radio, TV, Internet. Therefore, other channels of communication are recommended for working with them: conversations with environmental specialists, training of personnel, production of colorful posters and booklets in the national language, publication of articles in the national newspapers, filming and showing movies.

A special attention should be paid to the propaganda work with the local residents. It is necessary to pay more heed to improving the relations with them, to take measures for ensuring the support of the wetlands on their part. It is necessary to develop on a system level a program for developing contacts with the local population and the mass media in order to provide the local and state support for the protected area. This program could include: contacts with the mass media; informing the society and educating the public; familiarization of the visitors with the protected objects; environmental advocacy; publishing activity. The SPNT stuff should be trained in the methods for disseminating information, conducting the corresponding propaganda and preparing the information for mass media. As a result of this activity the local communities should embrace the need to protect the wetlands; it is necessary to explain to them how to do this, to get support from the local authorities and to create an atmosphere of responsibility.

Unfortunately, as it has been shown by the survey data, the work, which is being carried out with the local population, is not up to par, many people have only a superficial knowledge of the wetlands. It is necessary to conduct a systematic study of the efficiency of the advocacy activities based on the protected natural areas. The local communities should play a big role in the wetland management. The purpose of propaganda should be to cultivate in them a sense of unity and responsibility for the SPNT. It is desirable to involve local residents in the protection of the reserved area and to scientific work, maintenance of ecological trails. Undoubtedly, the creation of a unified system for monitoring and proper management of waterfowl populations will not only enable them to better understand the current situation of the wetlands, but also actively influence the solution of its regulation and protection issues.

***Fig. 31*** *Tash-Rabat – one of the must-visit places of the tourist program "Great Silk Road" (photo by A.T. Davletbakov)*

## Wetland Management Plan

The main objectives are: to preserve the unique, freshwater mountain lake in the natural state, the grassy ecosystems of the highlands - the habitats of rare and endemic species, remediation of the previously depressed pasture areas, ensuring natural reproduction and restoration of the population of the bar-headed goose, Marco Polo's sheep, introduction of monitoring of biodiversity, especially of key species and their communities.

At the Chatyr-Kul site of the reserve, zoning has not yet been carried out, therefore, uncontrolled grazing of cattle takes place. Nevertheless, Chatyr-Kul lake is in the least affected by an anthropogenic factor due to the marshy shore area, and this has a positive effect upon nesting and flying waterfowl. At Chatyr-Kul lake there is a nesting population of bar-headed geese, which does not exceed 50 pairs.

***The implementation of MP faces a number of problems:***

- *the current state of the priority objects for conservation of the flora and fauna of the reserve is insufficiently studied*
- *species and communities, which are threatened by certain circumstances and for which special protection measures should be developed, are not specified*
- *communication network is poorly developed: there is no communication between employees inside and outside the protected area*
- *unavailability of cordons for seasonal and year-round patrolling, which is carried out spontaneously*
- *poor budget financing of the scientific researches*

- *unavailability of fire-fighting equipment and appliances*
- *no biotechnical measures are taken to support the vital activity of wild animals*
- *existing boards and notice plates have become outdated and have not been updated for a long time. Many of them do not meet the required standards (they are not installed in the proper places, poor quality paint and poor-quality material have been used for their manufacturing)*
- *local community draws only a small benefit from the creation of the Reserve due to the limited use of the natural resources*
- *insufficient work with the local population on the issues of conservation of the environment of the Reserve*
- *lack of integrated monitoring, functional zoning and sustainable use standards*

The state of the wetland is adversely affected by unregulated grazing, which causes degradation of the plant communities, death of wild animals from loose dogs, and high levels of poaching.

A number of tasks are to be solved: to improve the regulatory framework, which ensures wetland conservation, to combat poaching, especially with regard to waterfowl and hoofed animals.

**Expert's opinion**

One of the most important tasks of the Karatal-Japyryk State Nature Reserve, namely, that of Chatyr-Kul Lake, is to involve the local communities in cooperation in the field of nature conservation. The employees of the reserve are working for environmental education. Within the frames of the action "March of Parks and Reserves" seminars, roundtables, exhibitions, lectures, talks, demonstration of slide shows, video films, albums on the topics of wetlands and conservation tasks, annual quizzes among schoolchildren for the best connoisseur of the wetland's flora and fauna, competitions and exhibitions of children's drawings, and other actions are organized. Taking into account the experience of the past years and the changed social and economic conditions, it is necessary to create a museum of nature to raise awareness of population, tourists and other visitors of the nature of the reserve, to increase environmental awareness among the local communities, to engage them in the environmental activities, conducting classes and trainings. The reserve has an insufficient number of literature and methodological developments for the work with the local communities.

**Recommendations**

First of all, the following measures are required: strengthening of the regulatory framework; development and implementation of the specialized programs for conservation of rare species – bar-headed goose, whooper swan, Marco Polo's sheep, etc.; organization of campaigns for environmental education, initiatives for establishing relations with the public

and border guards, their education and raising of awareness. Besides, it is necessary to build artificial islands as additional nesting places for bar-headed geese.

For managing the resources it is also required to restore the natural vegetation in the degraded areas, to create a database and make it available for the interested parties. Traditional methods of collecting and storing the information do not meet the modern requirements for managing biodiversity and wetlands in general.

The solution of the problems is hindered by the insufficient government funding of both the core activity of the reserve and specific measures for wetland conservation.

## 3.3. Turkmenistan

### 3.3.1. Turkmenbashy Bay

| | |
|---|---|
| ***Name*** | *Turkmenbashy Bay* |
| ***Registration in the Ramsar List*** | *July 3, 2009* |
| ***Relation to the SPNT*** | *Hazar State Nature Reserve (since 1968). Important Bird Area (since 2009)* |
| ***IBA*** | *TM 006* |
| ***Area*** | *267,124 ha* |
| ***Coordinates*** | *39˚47'47˝ Northern latitude & 53˚21'70˝ Eastern longitude* |
| ***Administrative belonging*** | *Turkmenbashy etrap and the city of Turkmenbashy of Turkmenbashy velayat* |

**Brief description**

The wetland embraces the entire water area and the shore of the Turkmenbashy Bay (the Eastern Caspian). 192,337 ha (or 72%) of the total area of the wetland occupies the northern part of the Hazar State Nature Reserve *(Fig. 32).*

The climatic conditions, depth and topography of the seabed, as well as the relief and character of the shores, their meandering - all in a complex cause the peculiarities of the hydrological regime. The shoreline of the water's edge is unstable, characterized by great variability and depends on fluctuations in sea level. The dynamics of this line is influenced by the interaction of erosion and aeolian coastal processes and surging phenomena, despite the fact, that the Krasnovodsk Spit protects the Bay from the stormy north-western winds. The formation of large waves is impeded by the embayment of the shores and the presence of islands (Ossushnye - large and small, Dagada and other small islands).

The abundance of heat contributes to warming up of the water, which impacts its density. Under the effect of an uneven distribution of this density, convection currents arise, directed towards greater density, that is, from the open sea to the bay. The water density also depends on temperature and salinity. Thus, local circular currents with low velocities (up to 12 cm/s)

are created in the shallow bays of the wetland. In the Bay these currents cause silting of the navigable channel, connecting Turkmenbashy port with the open sea.

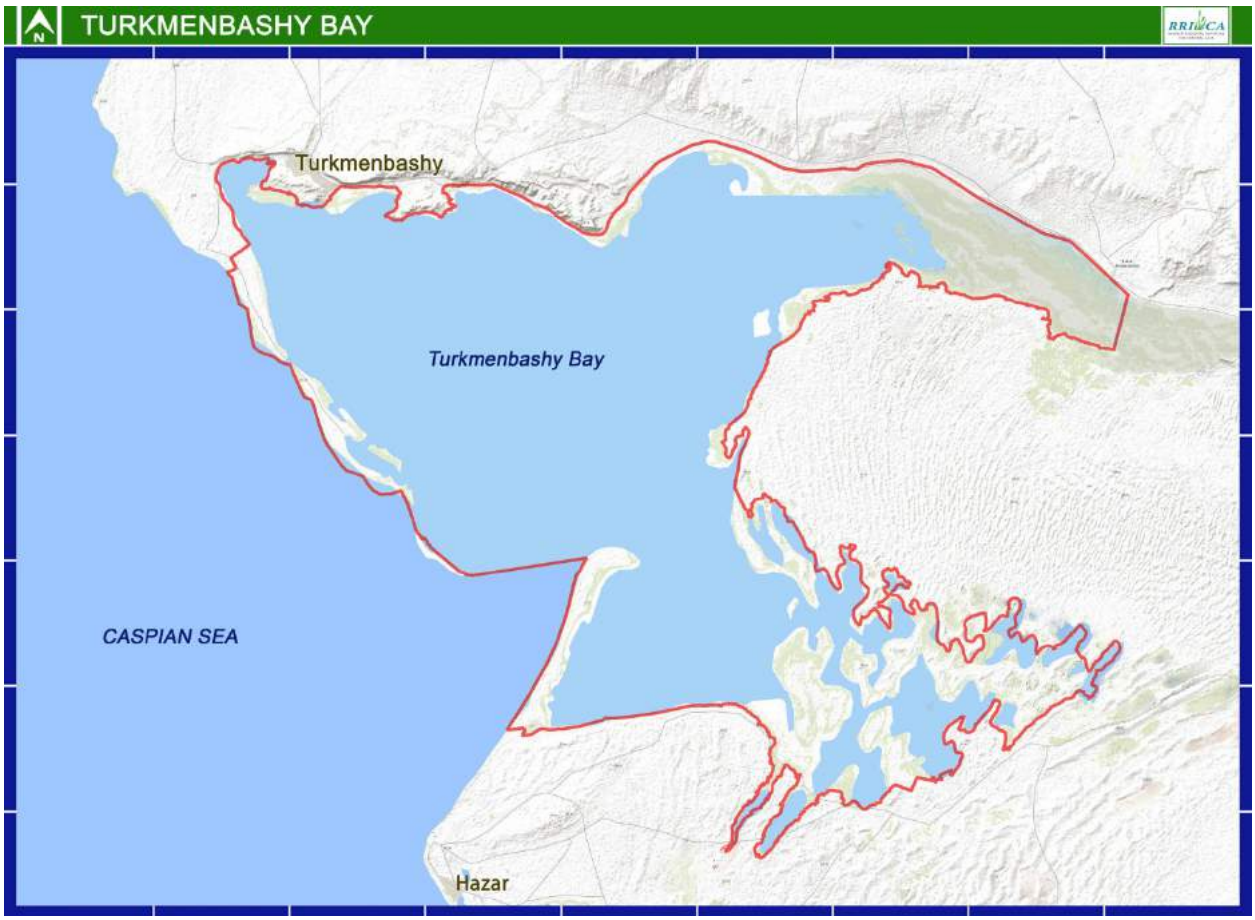


***Fig.32.*** *Localization of the wetland of Turkmenbashy Bay at the Eastern Caspian*

The deep-water parts, accumulating summer heat, strongly influence the distribution of temperatures in winter. The relief of the bottom influences the regime of heaving and currents of the sea and mixing of deep waters. Evaporation reaches high values.

By the nature of fluctuations of the level of the Caspian Sea, and therefore, of the wetland, perennial, annual and surging fluctuations are distinguished. The long-term course of the average annual fluctuations in the level is characterized by a certain alternation of periods with low and high levels, but since 1869 its steady decline was observed, especially since 1932. In 1956 the sea level was below the maximum of 2.94 m, with 2.18 m being in the last decades. This is probably due to the general climate warming, which has increased evaporation, as well as the regulation of the flow of the majority of rivers flowing into the Caspian Sea. The minimum levels were reached in the late 1960-s. In addition to perennial fluctuations, there are annual or seasonal changes of the level at which its maximum values are observed in summer, and minimum values - in winter. Average amplitude of the annual fluctuations is 25-30 cm, in some years making up 40-50 cm and even 55 cm.

The north-west winds create surges in the Bay, capable of raising the water level by 0.6 - 0.7 m for a short time. Herewith, its downsurge from the northern shore takes place, which is compensated by an influx from the open sea. The strong east and south-east winds are surging ones for the shallow eastern part of the wetland, in connection with which a wide

dereliction is here developed, connecting Dagada and Baklanada Islands with the land. Herewith, amplitude of the fluctuations may reach 1.0 - 1.5 m.

The temperature regime of water has a pronounced annual course. The formation of grease, and then ice, proceeded over all the years of observation, beginning from 1968. Extremely cold winters were repeated in the years 1971/72 and 2007/08. The maximum ice thickness in the bays reached 28 cm.

The greatest depth of the Bay is 11 m near the Ossushnye Islands and along the navigable channel, the separate deeps reach the depths of 7-8 m, in the North Cheleken Bay - up to 6 m, and in the Balkhan and Mikhailovskiy Bays no more than 2.0 - 2.5 m (outside the surging periods).

The bottom sediments are represented mainly by shell and oolite sand, which carbonate content reaches 90-96%, shell rock is widely spread, often in a clean, washed form. The gentle continental slope is covered with sandy silt, and its carbonate content is 50%.

The area of the wetland in the climatic relation is located in the deserted southern Turanian region of the subtropical belt. Its location in comparatively low latitudes determines high air temperature, which contributes to the accumulation of heat in the sea; water flow during the cold season considerably softens the temperature regime of the entire region: the climate is typically continental with large amplitudes of diurnal and seasonal temperatures, with low precipitation in abundance of sunlight. The number of days in a year with an average daily temperature above 20°C is 140. The duration of the frost-free period is 240-270 days. The average date of the last spring frosts is March 21, and the date of the first autumn frosts is December 11. The region, as a whole, is characterized by low-winded weather with the sharp wind increases up to 15-18 m/sec. The predominant directions during the year are NW (27%) and SE (18%), then N (15%) and E (14%). During the cold season, SE (35%) and S (21%) winds dominate. In spring and summer, NW (34%) prevails, and in autumn, along with NW (23%), SE (20%) prevails. The east winds of the stormy character are observed during the winter months and are associated with the intrusion of the Arctic air into the Caspian Sea and shifting of the southern cyclone through the South Caspian, and in summer - with the interaction of the low pressure region over the Central Asian areas. The snow cover is unsteady; there are years when it is completely absent. In the periods after the sea level rise, the summer humidity of the air increases markedly. In the early 1970-s it ranged from 50 to 65%, from the late 1990-s it often reached 80-90% and more.

## Biodiversity

The wetland is located in the arid desert zone, habitats of the land areas do not differ markedly. From the north, the coastal part of the Bay is represented by cliffs and mountain elements of the sedimentary and crystalline structure, which provide noticeable differences in biotopes. 528 species of higher plants, belonging to 79 families and 293 genera grow in the area. By the number of species, the following families are distinguished: the Paceaeae - 60 species, Asteraceae – 62 species, Chenopodiaceae – 53 species, Fabaceae – 48 species, Brassicaceae - 43 species. The remaining families are represented by the species numbering from 1 to 37.

The occurrence of loess-like sediments at the bottom stipulates the development of abundant and diverse zoo- and phytobenthos, as well as aquatic flowering vegetation and the corresponding fauna of vertebrate animals. Along the coasts deposits of silt, shell and

sand sediments are accumulated, as well as wash-outs of plant and other organic remains, which fertilize the soil of the peninsula. Saltwort, rare wormwood and tamarisk grow in such places. The sources of fresh water are absent, with the exception of rainfall and condensation of moisture from fogs and dew. Severe conditions of existence allow a limited number of small and medium species of animals inhabit the peninsula: arachnids, insects, small lizards and Caspian geckos, carpet vipers, mouse-like rodents, hedgehogs, bats and foxes. The abundance of dice snakes is explained by the presence of good shelters and affluence in the coastal waters of bull-calves, serving as their main food object. The appearance of seals and their landfall is very rare (the Ossushnye Islands). From the birds, little owls, chuckar partridge and see-see partridge, crested lark inhabit the coastal area. Common kestrel, different kinds of larks and wheatears are nesting in small numbers. The list of migrating and wintering birds is much richer and embraces more than 150 species, including waterfowl and wetland birds wintering at the coast.

***Fig.33.*** *The north-east part of Turkmenbashy Bay, a group of wintering swans (photo by E.A. Rustamov)*

The coastal zone is distinguished by a marked diversity with a good development of various plant associations. No constant sources of fresh water are available here. Nevertheless, the animal world is more diverse: woodlice, centipedes, ticks, arachnids, hundreds of insect species, including Axiopoena maura, introduced into the Red Data Book of Turkmenistan (2011). Central Asian tortoise, various geckos and lizard, toad agamas, two kinds of racers, steppe-ribbon-snake, carpet vipers, dice snake are examples of the local reptiles. From the mammals there are Brandt's hedgehog, eared hedgehog, common bats and long-eared bats, wolves coming in severe winters to the warmer coast. The permanent inhabitants along the coasts are fox, jackal, weasel, occasionally Turkestan polecat and marble polecat, and also very rarely – tolai hare, porcupine, wildcat and caracal. From the rodents there are long-clawed ground squirrel and Aral yellow souslik, great and little jerboa, sewer rat, house mouse, grey hamster, great, midday gerbil, and rarely, tamarisk gerbil, mole-vole.

The list of avifauna numbers more than 300 species. On the nesting places the following species may be observed: vulture, long-legged buzzard, common kestrel, dikkop, stilt, little ringer plover, Kentish plover and Geoffrey's plover, black-bellied sandgrouse, rock pigeon,

little owl, common and Alpine swifts, common and blue-cheeked bee eaters, hoopoe. Passeriformes are represented by the following families: larks, warblers, shrikes, thrushes, starlings, finches, buntings. On the islands, except for the birds listed above, great-crested grebe, slender-billed-gull, tern (gull-billed, sandwich, common and little terns) common cormorant, herring gull are nesting. In the settlements of the buffer zone, rock pigeon, collared and Senegal turtle doves, European swallow and common house martin, house and Indian yellow-throated sparrows are nesting.

The protected Ossushnye Islands, located in the western part of the wetlands, in the recent past were the reproductive center for the summer avifauna of the Hazar State Nature Reserve. With a weak variety of plant associations and almost complete absence of small invertebrates and vertebrates (except for dice snakes and hair seals), there were colonies of many thousands of seagull on the Islands. During the migration and wintering periods in the bays and in the shallow waters of the Islands more than 200 species of birds were registered, the number of some of them reaching thousands of species. When the sea level was raised, the islands became eroded by water. At present, due to the sea regression, the islands have reappeared, but so far they lack vegetation and colonial nests. The function of the Ossushnye Islands is performed, to a certain extent, by the new islands in the Balkhan Bay, in the north-eastern part of the wetlands, but their protection regime leaves much to be desired, especially in the nesting period.

## Legislative support

The issue of the protection of the wetlands is considered and supported by a number of national laws and international legislative instruments: the Laws of Turkmenistan "On Fisheries and Conservation of Aquatic Bioresources" (2011), "On Specially Protected Natural Territories" (2012), "On Wildlife Protection" (2012), "On Environment Protection" (2014), the Ratification of the Ramsar Convention by the Mejlis of Turkmenistan (2008), as well as the Protocols to the UN International Framework Convention for the Protection of the Marine Environment of the Caspian Sea, namely the Protocol on Biodiversity Conservation *(Article 3. Sphere of Application),* the Protocol for the Protection of the Caspian Sea against Pollution from Land-Based Sources and Activities *(Article 4. General Obligations),* the Protocol on the Environmental Impact Assessment (EIA) in a Transboundary Context *(Attachment II).*

## Ecosystem services

All types of basic services and benefits, provided by the wetlands (sea and desalinated water, fish, poultry, tourism, hunting and fishing) are vital for the local communities. The direct use of the biological resources, even outside the protected water area and land area, is carried out under supervision on the part of the Interdepartmental Commission of Turkmenistan on the Caspian Sea issues (which coordinates the economic and environmental activities in the Turkmen sector of the Caspian See, including the implementation of the National Caspian Action Plan (NCAP), the protection of the environment and its biological resources, preparation of the proposals and recommendations for improving the national legislation, related to the activities in the Turkmen sector of the Caspian See and on its coast, including the implementation of the Tehran Convention), the State Enterprise for Caspian Sea Issues under the President of Turkmenistan, the State Committee for Environmental Protection and Land Resources, represented by the Hazar State Nature Reserve and the "Hazar Eco-Control" Service, the State Committee for Fisheries, represented by the State Fishery Protection of

Turkmenistan. The urban and rural population uses seafood and game animals, primarily birds, in the areas adjacent to the wetlands, to the north of the city of Turkmenbashy and to the south of the city of Hazar, i.e. already in the South-Cheleken Bay, where the assigned hunting areas exist. The local people use the obtained products themselves and sell them at the markets. With regard to water, the city of Turkmenbashy takes it from the Bay not only for domestic needs, but also for the port, TCOR and other enterprises. Apart from sea water desalination the city is supplied with water through large water pipes from the "mainland".

The wetlands are used by the Research Department of the Hazar State Nature Reserve, as well as by the general education schools of the city of Turkmenbashy for educational and awareness-rising purposes *(Fig. 34)*. Every year, schoolchildren take part in the International Environmental Action "March of Parks" *(Fig. 35),* which is organized by the City Administration together with the Hazar State Nature Reserve. Usually, schoolchildren take out the garbage, collected along the banks of the wetlands, during the voluntary Saturday works (Public Service Days).

## Local communities and infrastructure

In the north-eastern part of the Bay there is a port city of Turkmenbashy with the population of about 80 thousand inhabitants. Among other settlements on the wetland banks and near it there are the Kenar and Yangaja. The city of Turkmenbashy includes two etraps (administrative districts) - Avaza (9,660 ha) and Kenar (7,262 ha). The first etrap includes the "Avaza" National Tourist Zone with an international airport and adjoining small residential areas, and the second one includes the main part of the city itself and the Kenar village, wherein a complex of oil storages is located. The city-forming enterprises, the Turkmenbashy Complex of Oil Refineries (TCOR) and the thermal electric power station, are located in the north-eastern part of the city.

***Fig.34.*** *Celebrating the Day of Birds (photo by E.A. Rustamov)*

***Fig.35.*** *The students of the city of Turkmenbashy at the wetland banks on the day of the "March of Parks" Action (photo by E.A. Rustamov)*

In the year 2014 the construction of the International Sea Port of Turkmenbashy has started. The total area of the port will make up almost 1.5 million m2. Its complex will include a loading terminal, a bulk cargo terminal, as well as ship-building and ship-repair yards. Apart from the construction of berthing facilities, the coastal infrastructure facilities are also envisaged.

The construction project has been developed in accordance with the "Green Port" international standard, which provides for the installation of bio-cleaning complexes in each terminal. In order to prevent the penetration of invasive organisms and pathogens into the marine environments, the ballast waters before their discharge will be treated and disinfected directly aboard ships.

The Hazar State Nature Reserve is located in the center of development of the Caspian coastal zone of Turkmenistan, and has a large number of interested parties *(Fig. 37),* that is why the compliance with all items of the Management Plan is required *(see below).* For example, the above TCOR is considered to be one of the interested parties, since it is the main potential polluter of not only the wetlands, but also the coastal zone of the entire central part of the Turkmen sector of the Caspian Sea.

**Value of the wetlands for the local population**

The local population may play a key role in the development of eco-tourism around the wetlands. That is why, the users of the resources from the relevant populated localities are important interested parties. For example, the Turkmenochotrybolovsoyuz (Turkmen Federation of Hunters and Fishers) is the only public organization that provides private individuals with the licenses for hunting, wherefore it should be a partner of the Reserve in working with the users of poultry and fish.

***Fig.36.*** *A view of the city of Turkmenbashy from the Bay (photo by E.A. Rustamov)*

The city and rural administrative bodies, as well as the Hazar State Nature Reserve, are interested in sustainability of the biological resources and the entire ecosystem of the wetlands. The population of the villages, especially small ones, around the wetlands and the Reserve is directly dependent on the biological resources, including fish and flying and wintering birds. Although hunting is allowed only in the hunting areas outside the territory of the wetlands and the Reserve, there is a high probability of an unauthorized use of the biodiversity resources in the protected area.

**Assessment of the wetland condition**

The above-mentioned plant (TCOR) has an oil terminal on the opposite, eastern edge of the city, at the Kenar village on the Ufra Peninsula, which coast is the immediate boundary of the wetlands. An increase in the oil and gas transportation, connected with the rapid development of the industry in the region, in case of non-compliance with transportation standards, is a potential threat to the ecosystem of the Hazar State Nature Reserve as a Ramsar Site.

The "Hazar Eco-Control" Service is the key player in monitoring the environmental state of the sea coast in the Turkmen sector of the Caspian Sea. The organization has laboratories and field facilities for monitoring the environmental state of the coastal waters and the coastal zone, including the wetlands. Therefore, this structure is a key partner in monitoring the state of the ecosystem in terms of the threat of pollution.

**Expert's opinion**

The development of scientific research in the Hazar State Nature Reserve is impossible without the involvement of the academic base and higher educational institutions of the country. Besides, the educational institutions are able to provide the stuff for the work in the Reserve. Conducting joint researches, providing the territory of the Reserve and wetlands for the conduction of relevant scientific researches (surveys, observations, etc.) will

undoubtedly increase their scientific level in the Reserve. The schoolchildren's Club of Birdwatchers has conducted the Day of Migratory Birds under the AEWA program, the International Bird Watching Day *(Fig. 38),* the Ornithologist Day, much work has been carried out to promote the protection of birds and other components of biodiversity in the given wetlands.

***Fig.37.*** *Meeting of the representatives of the interested parties with the Administration of the Hazar State Nature Reserve (photo by A.S. Veiyissov)*


***Fig.38.*** *The students of the "Club of Birdwatchers" of the city of Turkmenbashy (photo by E.A. Rustamov)*

## Ecotourism

The Administration of the Balkan velayat (an administrative territorial unit of the scale of an oblast) should play a key role in the observance of the provisions on the Hazar State Nature Reserve and the Ramsar Site, as well as in ensuring the ecological condition of the the Caspian Sea coastal zone, and in maintaining the stability of the ecosystems in the region. It is directly interested in the creation and development of the "Avaza" National Tourist Zone, and together with the hyakimlik (the Mayor's office) of the city of Turkmenbashy, is responsible for the development of the "Avaza" zone. And this includes the enhancement of eco-tourism not only on the sites bordering the reserve, but also in the whole territory of the wetlands.

The "Avaza" National Tourist Zone is a modern resort town, located 4 km from the western border of the wetlands and 12 km from the city of Turkmenbashy *(Fig. 39).* During the summer season, the "Avaza" National Tourist Zone is visited by the tourists from all Turkmenistan and from abroad. The number of vacationers in the "Avaza" zone may reach up to 4000 people. More than 20 hotels out of the 60 planned ones have already been built; there are 6 cottage complexes, 7 health centers, 2 yacht clubs, and a network of restaurants and cafes, mainly located along an artificial canal with the length of 7 km. The construction of family cottages and villas, sports and entertainment complexes, an international press center, etc. is being continued.

***Fig.39.*** *The "Avaza" National Tourist Zone (photo by TDH)*

## Conclusions on the work with the local population

According to the Resolution of the President of Turkmenistan, the International Day of the Caspian Sea is held annually (since 2007) on August 12 in the "Avaza" National Tourist Zone. All interested parties participate in this action, including the representatives of the Caspian bordering states, international organizations, as well as the public at large. The purpose of the event is to draw attention of the public and local communities to the problems of the Caspian Sea, the provision by them of practical assistance in raising environmental awareness and education of the population, and the formation of ecological culture. This event is widely covered in the mass media at the national level.

According to the polling survey of the respondents, the value of the wetlands is defined mainly as a place for the biodiversity protection (73%), as a habitat for the migratory birds (61%) and only after this, as a tourism territory (40%). The respondents have noted that over the past few years the water level in the Caspian Sea has dropped. The greatest positive impact on the wetlands is produced by the Reserve (84%) and the development of the "Avaza" National Tourism Zone (65%), the negative effect is produced by the development

of a quarry near the Kenar village (88%), industrial and domestic effluents (77%), and poaching (63%).

Unfortunately, the vacationers in the "Avaza" National Tourism Zone still are very poorly involved in eco-tourism, in bird-watching or wildlife photography. Nevertheless, the Administration of the Hazar State Nature Reserve and the local businesses should be interested in the provision of investments and financing of the projects for the development of the methods for using the environmental benefits and services, including the development of ecological and rural tourism in the territories bordering on the wetlands.

**Expert's opinion**

The local Administration is directly interested in the activities of the Hazar State Nature Reserve. In accordance with the Law of Turkmenistan "On Specially Protected Natural Territories", the declaration of the relevant territory as a State Nature Reserve entails the withdrawal of the relevant land plots (water objects) from their users and owners following the procedure, established by the legislation of Turkmenistan, and assigning thereof to the Reserve for the perpetual use. Thus, the Hazar State Nature Reserve together with the Ramsar Site, being one of the varieties of specially protected natural areas, as well as the Turkmenbashy Bay itself; represent a territory restricted for use, with a reserve status of the most part of this territory.

There is another important aspect: the border troops in the Turkmen sector of the Caspian Sea have a high technical potential to control the movements in the water area. An Agreement for joint activities has been concluded between the border troops and the Hazar State Nature Reserve, which includes joint raids and measures for increasing control over poaching. The border guards represent a partner of the Reserve in ensuring the compliance with the regime of dormancy in the wetlands. Besides, the State Fishery Protection of Turkmenistan has a head office in the city of Turkmenbashy, and is entrusted with the functions of controlling the sustainable use of the Caspian bioresouces and issuing permits for fishing. Thus, the State Fishery Protection of Turkmenistan is another important partner in ensuring the compliance with the laws and protection of the Turkmenbashy Bay wetlands.

**Wetland Management Plan**

The Management Plan is available. It has been developed as part of the implementation of the Project "Conservation and Sustainable Use of Biological Diversity of Global Importance in the Hazar State Nature Reserve on the Caspian Sea Coast" (2006-2010) and aims to demonstrate the effective management of the protected areas for conservation of all biodiversity of the Hazar State Nature Reserve, including the wetlands of the Turkmenbashy Bay, which have not yet been nominated as a Ramsar Site by that time.

The MP has been used in the development of their nomination in the year 2009. The main success in the creation and maintenance of the MP of this Ramsar area is based on the fact, that more than 70% of thereof is occupied by the Hazar State Nature Reserve, and its goals,

objectives and the ways of their achieving are developed and considered in its MP, which allows the MP implementation to be continued also at the present time.

***The MP implementation is ensured by the following aspects:***

- *There is a regulatory legislative framework, in accordance with which the protection of the territory and imposition of sanctions for the violations of the current regime are being implemented.*

- *The Hazar State Nature Reserve has an office and a zoological museum. The office and museum are located in the city of Turkmenbashy, and are easily accessible to the local residents. The Reserve has the staff for the performance of monitoring protective, scientific and educational functions.*

- *The Hazar State Nature Reserve has a base for the continuation of scientific researches. Within the frames of maintaining the "Nature Annals", the data on phenological phenomena and a number of the most important or endangered species of animals and plants are being collected. The Reserve has a library.*

- *Zoning of the territory has been accomplished – in the assigned zone of the Reserve there is an opportunity to carry out educational and tourist activities.*

- *Conservation of natural wildlife complexes is an additional attractive component for the development of the "Avaza" National Tourist Zone, which is attached an ever increasing significance.*

It is also noteworthy, that the Hazar State Nature Reserve, according to the GEF assessment, has the status of the most important protected natural territory, and is also the Important Bird Area of the "BirdLife International" (2009) and included in the Ramsar List of the wetlands of international significance (2009).

***The main tasks and objectives, set out in the MP, have been implemented with different efficiency, beginning from the year 2010, including:***

- *Monitoring studies of the wetland birds have been continued in the frames of the "Nature Annals". This is a very important aspect, since on this Ramsar area the monitoring of migrating, wintering and nesting birds has been going on already for 50 years and this is one of the very important scientific achievements. The gathered scientific information will help in studying the problem of the impact of climate changes and the adaptation of animals to these changes.*

- *Research is also being conducted within the frames of the "Nature Annals" on the species composition of fish and invasive species in the ecosystem of the Caspian Sea, as well as the problems, associated with the Caspian seal.*

- *The works for the protection of the territory, including the joint actions with the police, border guards, the "Hazar Eco-Control" Service, the Turkmen Federation of Hunters and Fishers, have been continued.*

- *Ecological classes for schoolchildren, students and tourists have been held in the museum.*
- *Annual actions for cleaning up the coasts have been carried out with schoolchildren.*

- *Seminars with the other interested parties and resource users, including the local fishermen and hunters, have been held.*

- *Seminars for increasing the knowledge and skills of the scientific staff of the Reserve, including the seminars on counting the wetland birds, have been conducted.*

However, the Management Plan includes not only the concrete actions, but also the general approaches to the planning of the next stages for improving and developing the works for the protection and sustainable use of the territory. The construction of the terminal in the Kianly village, the international seaport and the sturgeon hatchery in the city of Turkmenbashy, the further development of the "Avaza" International Resort (a transition to a new stage), the development of the border and city infrastructure and the growth of the urban population in the Turkmen sector of the Caspian Sea, all this determines a challenge for refining and development of the MP so, that a new integrated approach to the management system of these wetlands should be fully implemented.

**Recommendations**

In developing the Management Plan the main task has been to find a new approach to the conservation and management of the natural resources by the example of the Hazar State Nature Reserve, and its introduction into the SPNT system of Turkmenistan. According to the Management Plan, over the past years the management potential of the Hazar State Nature Reserve has been developed and its environmental performance has been enhanced. The technical base of the Reserve has been strengthened. An interdepartmental approach is aimed at creating the integrated coastal management and biodiversity objectives for their inculcation into the production sectors, adjoining the Reserve. An information field has been built between the Administration of the Reserve and the local population. In the villages, adjacent to the wetlands, some models of sustainable use of the biological resources have been demonstrated.

**Based on the consultations with the leadership of the Hazar State Nature Reserve and the members of the Working Group for the implementation of the Ramsar Convention in Turkmenistan, the following short-term tasks and activities have been formulated:**

1. To update the borders and zoning to ensure the adequate management of the Reserve territory in connection with the construction of an international seaport, changes of the coastline, the emergence of bulk islands, border and tourist infrastructure, etc.

2. To develop the systematic and integrated protection of the territory, ecosystems and species of the fauna, especially those of commercial interest in cooperation with the police, border guards, the "Hazar Eco-Control" Service and the Turkmenokhoyrybolovsoyuz (the Turkmen Federation of Hunters and Fishers). At the present stage, the modern methods of tracking the territory may be used, including video shooting from aircrafts, attraction of modern tracking systems. Such joint works should be developed on a regular basis in the form of regular raids. The

coordination of efforts of all interested departments and organizations will be of a big importance for such works, which will make them more efficient.

3. To continue monitoring of migratory, wintering and nesting wetland birds as part of the work for maintaining the "Nature Annals", and fulfilling obligations within the frames of the Ramsar Convention, the Convention on Biodiversity and the relevant Agreements on the Caspian Sea. The accounts of wintering wetland birds are the basis for assessing their resources and planning the permissible rates of harvesting. Thus, monitoring of these birds is an important international contribution to the global methodology and database, which make it possible to carry out global assessments of current changes in the fauna, especially in relation to the global climate changes and the possibility of adaptation thereto. It is necessary to cooperate with the BirdLife International, AEWA, as well as the Wetlands International - which is an operating structure that ensures the scientific and methodological component of the works under the Ramsar Convention.

4. To continue the work for the study of the importance of the territory as a place for feeding and reproduction of commercially important species of fish. For this purpose it is necessary to use modern technologies of location and underwater shooting. For the development of these works it is necessary to involve international experts in the frames of the Convention on Biodiversity and the Caspian Environment Program (CEP).

5. It is especially important to continue developing the scientific researches and to not lose the results, which have been accumulated over 50 years. A special work should be undertaken to process the archives and to use them for assessing the adaptive capacity of ecosystems and the global trends in changing the coastal areas not only of the Turkmen sector, but of the entire Caspian Sea environment.

6. To develop cooperation with the interested parties in using the resources in the adjacent territories, including hunters. The basis for such works has been laid by the results of the GIZ. In the near future, it is necessary to plan the continuation of the work together with the GIZ and Wetlands International. The joint work with the Turkmenokhotrybolovsoyuz (the Turkmen Federation of Hunters and Fishers) is necessary for the improvement of the production regulation (establishment of the reasonable quotas), and the hunter's awareness of the importance to protect the reserved area, including the conservation of the waterfowl resources.

7. To develop the new opportunities for the employment of the population in the sphere of provision of tourist recreation, including nature tours, bird-watching, wildlife photography. The further development of the "Avaza" National Tourist Zone offers a unique opportunity to improve employment, and, as a result, to reduce the environmental pressure. It is necessary to organize the courses on the new forms of employment. The development of the new forms of tourism, related to the outdoor recreation, will make it possible to expand the period of active use of the "Avaza" National Tourist Zone.

8. In the Turkmenbashy Bay and the adjacent water areas of the Turkmen sector of the Caspian Sea, it is necessary to keep watch over the marine ecosystems control in order to meet the necessary conditions for feeding and reproduction of the fish populations.

9. It is necessary to use the opportunities for the active dissemination of the information on the importance of the wetland conservation among all resource users. The opportunities to publish special leaflets (brochures) with such information, to speak in the mass media, to use outdoor advertising should be found.

10. To continue the development of the work under the environmental projects with schoolchildren, students. To develop the educational activities of the museum, especially of the interactive component.

### 3.3.2. Zeyit Reservoir named after the 15th anniversary of Independence of Turkmenistan and the Kelif Lakes

| | |
|---|---|
| ***Name*** | *Zeyit Reservoir named after the 15th anniversary of Independence of Turkmenistan and the Kelif Lakes* |
| ***Relation to the SPNT*** | *Kelif Sanctuary of the Amu Darya State Nature Reserve* |
| ***IBA*** | *TM 048* |
| ***Area*** | *85,488 ha* |
| ***Coordinates*** | *37˚31'00˝ Northern latitude & 65˚06'00˝ Eastern longitude* |
| ***Administrative belonging*** | *Kerki etrap and the Halach etrap of the Lebap veyalat* |

**Brief description**

A typical wetland in the desert conditions of Central Asia artificially formed in the middle of the last century as a result of filling by the Amu Darya River of the saline depressions of the Kelif Uzboy, where the same-named lakes emerged *(Fig. 40).* After their silting and shallowing, they ceased to play the role of a mud trap of the Amu Darya water, and in the 1980-s the other, largest one in Turkmenistan, Zeyit Reservoir was built (since the year 2006 it has been named after the 15th anniversary of Independence of Turkmenistan) with an area of almost 70 thousand hectares, wherein the water also comes from the Amu Darya river. There emerged an extensive system of large and small lakes, overflows, shallow waters, islands and a lot of loop lakes and, as a result, favorable conditions were created for nesting, migrations and wintering of the wetland birds. The wetland consists of two parts: the south-east, large part (the Zeyit Reservoir) and the north-west, much smaller part - shallow and considerably overgrown with hydrophilous vegetation (the Kelif Lakes), and separate completely silted areas, already developed for sowing. The quarter of the wetland area is located within the boundaries of the Kelif Sanctuary of the Amu Darya State Nature Reserve.

Winter is moderately cold (a zone of warm winters), with an average temperature of -2° C to +4° C, very rarely in some years down to -20° C. The vegetation period is up to 240 days. The coastal vegetation is represented mainly by reed thickets with the participation of tamarisk,

akbash, yandak; to a lesser extent cherkez and other saltwort; in the north-west part – here and there oleaster and Asiatic poplar; here and there fields (forage crops). From the water plants the main ones are reed mace, pondweed, algae (naias). In the sandy areas there is the ilak-kyrty cover with short kandyms, less often the cherkez and saxaul.

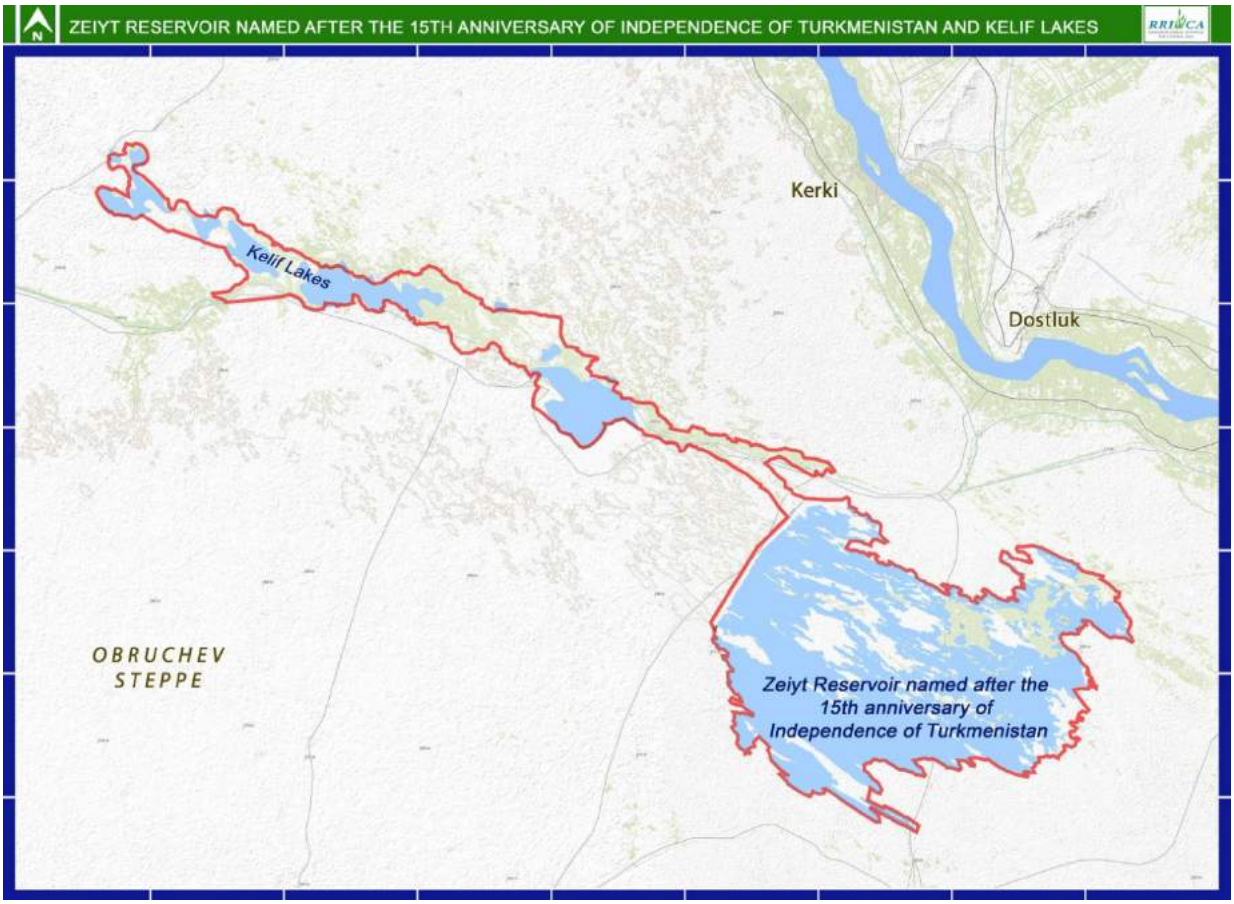


***Fig. 40.*** *Localization of the wetland of the Zeyit Reservoir named after the 15th anniversary of Independence of Turkmenistan and the Kelif Lakes.*

This is a potential Ramsar Site, the nomination of which is planned by the Working Group for the Ramsar Convention in Turkmenistan. Here emerged a complex of nesting, flying and wintering wetland birds, which number in November-January is more than 20 thousand species (up to 25 types of species). The wetland is one of the main wintering sites for these birds in Central Asia. The threatened species are represented by Dalmatian pelican, common pochard, stiff-tailed duck. Coots, mallards, red-crested pochard dominate. Their share, according to the long-term counts, make up on the average 30.7, 21.9 and 14.9% respectively. The Co-dominating species (1-10%) are European wigeon, gadwall, European teal, pintail, common shoveler, common pochard, tufted duck, common cormorant, little cormorant, greater white-fronted goose, gray goose, common crane. The number of these birds is characterized in general by the pronounced annual dynamics.

**Ecosystem services**

The water supply of the adjacent settlements, as well as irrigation of the farmlands on the virgin soils is realized solely at the expense of the Reservoir water and directly from the Karakum Darya River. Fishing is of great importance, but all fish is intended for selling to the cities, even to Ashgabat. In this fishery the local community does not take an active participation, the fishing teams usually consist of the non-residents. The local residents also

catch fish *(Fig. 41)* and still receive income from livestock management and growing vegetables and fruits, hunting being of secondary importance.

## Local communities

The largest part of the wetland is located within the boundaries of the Kerki Etrap (an administrative district), and its smaller part - in the Halach Etrap of the Lebap velayat (oblast). The both etraps have agricultural orientation and planning. The population of the first one is more than 150 thousand people, 25% of them is concentrated in the administrative center, Kerki, located 50 km from the wetland. In the neighboring Halach Etrap the population makes up about 100 thousand people, 20% of which is in the Halach village. Directly on the banks there are two settlements - in the central part of the wetland, on the banks of the Karakum Darya river - the village named after the 15th anniversary of Independence of Turkmenistan (2 thousand inhabitants), and in the western part – the Karametniyaz village (500 inhabitants).

These settlements emerged as villages of hydro-builders, and at present their population is employed in the private agrarian sector and cattle-breeding, to a small extent, in fishing and hunting. In 15 km to south-west of the wetland there is another small village, Vatan, which originated on the virgin, newly developed lands. This village, like the surrounding agricultural land, is also supplied with water from the Reservoir, but the village inhabitants do not have any relation to the other services of the wetland.

## Value of the wetlands for the local population

This Reservoir is of vital importance for the local people. The respondents have noted a decrease in the incoming volumes of water in the Reservoir in recent years, which adversely affects the socio-economic status of the local communities. In their opinion (51%), a positive effect upon the level of life in the wetlands may be produced by the involvement of the local residents in fishing; a negative effect is produced by sedimentation (75%), the change in salinity and drainage (79%).

## Assessment of the wetland condition

The potential threats to biodiversity of the wetland are as follow: unlimited fishing all year round, poaching and reed fires.

## Ecotourism

Ecotourism is absent, which is explained by the remoteness of the wetland from the large cities. However, the local administration is interested in the development of tourism, especially if it provides income for the local communities.

***Fig.41.*** *Amateur fishery near the village named after the 15th anniversary of Independence of Turkmenistan (photo by E.A. Rustamov)*

**Conclusions on the work with the local population**

The overwhelming majority of the respondents (93%) believe that the local community does not have any income from the wetland, as its resources are exploited by the other people and departments, without an agreement with the local Administration. The local residents have trouble picturing their participation in the organization of eco-tourism and the provision of the related services, that is why, they do not see their role in this process.

***Fig.42.*** *The Reservoir exit site at the village, named after the 15th anniversary of Independence of Turkmenistan (photo by E.A. Rustamov)*

***Fig.43.*** *Checking-up of the poachers' nets (photo by E.A. Rustamov)*

A comprehensive Management Plan, taking into account the characteristics of biodiversity as a component of the entire wetland ecosystem, has not been developed. However, the development and management of the Reservoir is carried out according to the plan for the operation of the entire Zeyit hydroelectric complex, as an important economic and protected facility, including the construction of a head dam and its alignments, the dam and Reservoir beds, the corresponding sections of the Karakum Darya river, and the adjacent coastal zone. This plan provides for water supply regimes, water supply seasonal rhythms, conservation measures, land survey works.

**Recommendations**

After the nomination of the wetland to the Ramsar List, it is necessary to develop a Plan for the management and sustainable use of the biological resources of the Reservoir, especially fish stocks and poultry. The boundaries of the Kelif State Sanctuary should be updated: it is very important to include therein the Reservoir with the appropriate shore areas, since the wetland is one of the key places for migration and wintering of birds in Central Asia, where they have been monitored for more than half a century *(Fig.44).*

***Fig.44.*** *Winter count of waterfowl at the bank of the Zeyit Reservoir (photo by E.A. Rustamov)*

### 3.3.3. Lake Kurtli

| | |
|---|---|
| ***Name*** | *Lake Kurtli* |
| ***Relation to the SPNT*** | *Important Bird Area (since 2009)* |
| ***IBA*** | *TM 028* |
| ***Area*** | *1,421 ha* |
| ***Coordinates*** | *38˚01'00˝ Northern latitude & 58˚22'00˝ Eastern longitude* |
| ***Administrative belonging*** | *the city of Ashgabat* |

**Brief description**

The Lake-Reservoir, including the shore areas, is located in the north-western part of Ashgabat. The city itself and its agglomeration are located on the piedmont plain, between the Kopet Dagh and South Karakum mountains. The altitude above the sea level is 210-240 m. The climate is characterized by dry hot summers and mild winters. Minimum precipitation is in July-August, maximum is in March-April. There is almost no snow cover, with the exception of extreme winters. The air temperature in January is 0.8° C on the average, in July being + 30° C. The frost-free period is 232 days a year, the number of clear sunny days is 231.

Kurtli Lake is a potential Ramsar Site, which nomination is planned by the Working Group for the Ramsar Convention in Turkmenistan, as the first urban "Wetlandpark" in Central Asia. The lake was formed in the year 1963 while filling the Kurtli stow in the same-named depression with the waters of the Karakum Canal (now the Karakum Darya River). The current sizes of the lake are 5 x 3.7 km, the maximum depth is 7 m, the average depth is 4.4 m, the shoreline length is 25 km *(Fig.45 and 46).* The banks are gentle, without high steep cliffs, sandy, sometimes swampy, with reeds, tamarisk, saltwort, mainly along the southern shore, with artificial planting of woody species – oleaster and Eldar pine here and there. Pondweed and parrot's feather predominate in the shallow waters. The ephemeral cover with sparse shrubs of kandym, cherkez, astragalus, selenium, predominates on the shore fixed areas.

The wetland is located in the flyway zone along the northern Kopet-Dagh foothills. In winter, more than 20.000 of waterfowl and semi-aquatic birds gather here. The most important among them are little cormorant, rufous-crested and common pochard, tufted duck, mallard and coot. In general, the avifauna includes 17 non-migratory species, 35 migratory-nesting species, 42 transient-wintering species and 118 transient species.

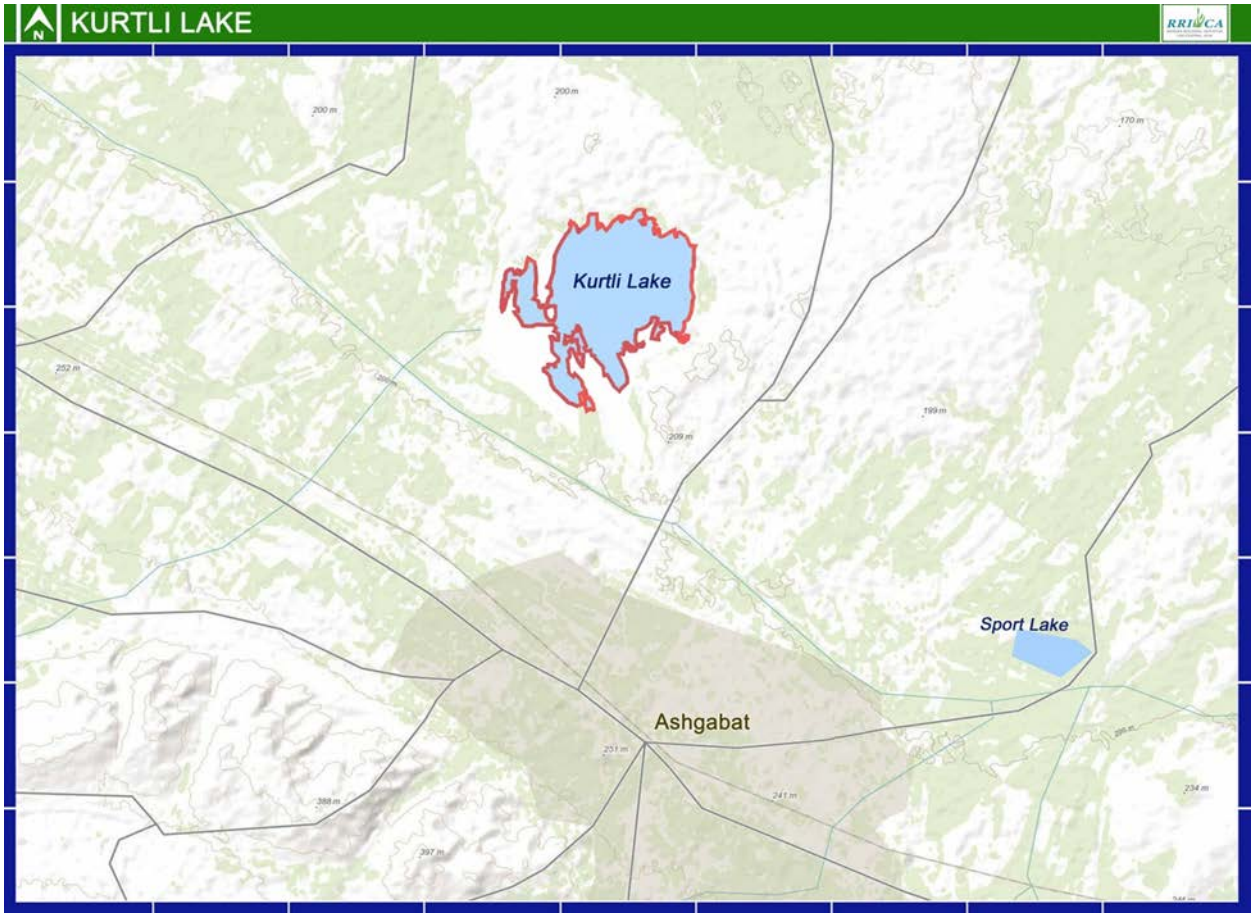


***Fig.45.*** *The localization of the Kurtli lake wetland*

## Ecosystem services

The lake was used not only as a reservoir for regulating the water passage through the canal, but also as a recreation place for the city people: small beaches, a boat station, a tourist camp and ministerial health resorts (now all this has fallen into disarray). The Reservoir serves as a settling tank (it has the installed filtration equipment) in the water supply system of the

city and adjacent settlements. The wetland is regulated seasonally by supplying the required volumes of water from the Karakum Darya River. Hunting is prohibited here, only amateur fishing is allowed. For the enrichment of the Reservoir, it is being stocked with fish by way of planting the commercial species (carp, pike-perch, Chinese carp, and silver).

## Local communities

The wetland is located within the borders of the city of Ashgabat, which is a separate administrative territorial unit - a city with the rights of a velayat (an oblast). The population makes up 900 thousand people. In the year 2013 the wetland area has been completely included within the city boundaries with the administrative division and expansion of the city of Ashgabat. To date, a project for the improvement of this urban area, has been developed, which is aimed at cleaning the shores of the lake and the construction of health and sports complexes with the appropriate infrastructure: boarding houses, cottages, camping sites, villas, sports grounds, parks, restaurants and cafes, etc. By its natural-ecological parameters and services it will become in the long run a favorite recreation place for the Ashgabat residents and other visiting tourists. The estimated number of vacationers is up to 200 thousand people per year upon the year-round visiting.

## Wetland value for the local population

There are no permanently resident people directly on the wetland; the nearest urban districts of the Choganly residential area are in 3 km to the south-east. To date, the main value of the Reservoir is its participation in the overall system of water supply for the city of Ashgabat, and the fact, that the lake, being the Important Bird Area, is a place for gathering of wetland birds during their migrations and wintering.

As the questionnaire survey has shown, some respondents (38%) regret that the infrastructure, remaining from the 1980-s, has declined, it concerns especially the older people. At the same time, the majority of the young respondents (55%) look positively and with a hope at the future recreation area on the shores of Kurtli Lake, being also sure that this will not damage its biodiversity and will only enhance the environmental and aesthetic aspects.

The World Wetlands Day in the year 2018 has been held under the slogan: “Urban wetlands are precious lands, rather than useless lands.” Indeed, every wetland, in this case the urban wetland, such as Kurtli Lake, desilts and filters the polluted water, being a source of drinking water, improves the air quality. Kurtli Lake is included in the urban area development plan and in the near future the lake, together with the adjacent territories, will become a city district of a favorable ecological environment and a source of income.

## Assessment of the wetland condition

The assessment is positive, there are quite suitable conditions for birds, with no anthropogenic and fishing-hunting pressure (with rare exceptions), despite the pollution of the shore area with the household wastes and, in some places, construction debris. The improvement of the coastal stripe will not affect the number of birds; the lake will perform the role of the Important Bird Area and dormancy zone as before. The wastes of domestic and construction debris, accumulated in the past, lead to the degradation of the shore and the loss of its value.

***Fig.46.*** *The south-eastern shore of the Kurtli river (photo by E.A. Rustamov)*

**Ecotourism**

Currently, there is no organized tourism, moreover, eco-tourism on the wetland. People visit the Reservoir only privately. However, the khyakimlik (the City Administration) is the key interested party of this wetland that is why one may expect that over time Kurtli Lake will become a cozy, environmentally friendly area of the city of Ashgabat, one of the most popular places for living, recreation and tourism. In this regard, it is important to ensure, that the viewing platforms should be built along the shores of the lake *(Fig. 48)* for the observation of the flocks of migratory and wintering birds and the surrounding terrain as a whole.

**Conclusions on the work with the local population**

An analysis of a survey of random respondents by an expert visiting the wetlands is not sufficient to draw the appropriate conclusions.

**The expert's opinion**

In connection with the prospect of improvement of the shore area and the use of the wetland as a recreational, entertainment and tourist center, it is very important to ensure that the viewing platforms are constructed along the shores of the lake to observe the flocks of migrating and wintering birds and the surrounding terrain as a whole. It is necessary to include in the future Management Plan the organization of a bird-watching club here.

***Fig.48.*** *The former viewing platform at Kurtli Lake (photo by E.A. Rustamov)*

The Wetland Management Plan is not developed at present. However, the management of the protection and hydro-regulation of the Reservoir is available in connection with its use as a settling tank for the supply of drinking and technical waters to the relevant area of Ashgabat and adjacent villages.

**Recommendations**

It is necessary to engage the experts, an ecologist and ornithologist, for the reconstruction of the wetland and appropriate construction. Before the completion of the construction, prior to the commissioning of the entire complex (the wetland ecosystem + the shore infrastructure), it is necessary to develop a Management Plan for the area, taking into account the hydrologic regime and hydro-biological and ornithological situation.

# 4. Improvement of the standards of the best practices and the recommendations for their inculcation

## 4.1. Best practices on the Ramsar Sites of the region

*The main management directions, which are important for the protection of the Ramsar Sites, include the following:*

- *planning and zoning of the territory*
- *state cadastre registration of land plots and the state cadastre of the SPNT*
- *maintenance of the state water register and/or other accounting of the natural objects*
- *establishing and changing the designated use of lands*
- *making the lands and other natural objects available for use*
- *the land and forest management*
- *monitoring of the state of the natural objects and their complexes; supervision over the compliance with the established requirements for the use and protection of the natural objects*

Ignoring the ecological and socio-economic specifics of the wetlands may lead to underutilization or loss of the health-improving and recreational functions of the wetlands, and consequently, to the reduction of the "quality of life" of the local communities.

Of all the wetlands in the region 10 have been selected for studying the practices and plans for their management *(Table 1),* among them only 6 are the Ramsar Sites. They have been assessed accordingly *(Table 4),* based on the criteria (functions) of best practice in the management of wetlands, developed by the international experts of the Convention *(see Section 2.2).*

While characterizing the corresponding assessment of the studied practices according to these criteria in general, the situation in the region seems to be most successful with such indicator as the determination of factors, which produce or may produce effects upon the wetland characteristics (4.7 points on the average) and the determination of the management goals and objectives (4.5 points). The Tengiz-Korgalzhyn lake system, Song-Kul Lake and the Turkmenbashy Bay (5 points each) stand out particularly. The assessment of the indicator of the information exchange within the wetland, with the other wetlands, organizations and interested parties makes up 3.8 points. Further, the success of fulfillment of one or another criterion has been evaluated as follows: ensuring continuity of the efficient management (3.7 points); defining and description of the system of measures, which are necessary to achieve the set objectives; and the compliance with the local, national and international policies (3.5 points each); efficiency and viability of the management (3.2 points), defining the monitoring conditions (2.8 points); the settlement of conflicts and search for the resources (2.5 points).

Finally, it appears that the best management practices are applied on such wetlands as the Tengiz-Korgalzhyn lake system in Kazakhstan, the Song-Kul lake in Kyrgyzstan and the Turkmenbashy Bay in Turkmenistan, each of which has scored, in the aggregate of the criteria, the maximum number of points - by 37 of 60 possible points. This is the best performance in the region, and that is why one should pay attention and adopt practical experience of managing these particular Ramsar Sites. The assessment of the management practice on the Issyk-Kul and Chatyr-Kul lakes in Kyrgyzstan is less successful, making up in the aggregate 36 and 34 points, respectively; and the Alakol-Sassykkol lake system in Kazakhstan has scored only 26 points.

## 4.2. Recommendations for the management planning in the practices of the existing wetlands

The wetlands provide conditions for the development of a variety of types of using the natural resources for the local communities: water supply, fisheries, agriculture (due to the maintenance of the groundwater level and high soil fertility), cattle breeding, poultry farming, beekeeping, hunting, procurement of medicinal raw materials, recreation and tourism, etc.

As a result of the performed works, the national experts of the project have developed the generalizing proposals. Based on the experience of the three countries, recommendations for the conservation, development, and dissemination of the best available practices for the sustainable use of the wetlands in Central Asia have been developed:

1. To update the boundaries and to carry out zoning to ensure an adequate management of the area due to the natural and anthropogenic changes in ecosystems (this applies to all wetlands, which are within the protected areas). To organize and equip the viewing platforms (as, for example, in the Alakol state nature reserve) for bird observations and more effective compliance with the protection regime. To expand, if necessary, the network of protected areas for more reliable protection of the appropriate wetlands (for example, the wetlands of the Lesser Aral Sea and the Syr Darya river delta).

2. To create ecological corridors for ensuring migration of wetland birds, as, for example, in the Hazar and Korgalzhyn state nature reserves.

3. To ensure regulation of pasture loads in order to reduce their negative impact on the wetlands.

4. To continue monitoring of migratory, wintering and nesting wetland birds (in cooperation with the BirdLife International and Wetlands International) in the frames of the works for the implementation of the obligations under the Ramsar Convention, the Convention on Biological Diversity and other agreements.

5. To conduct, as much as possible, scientific researches, to use the accumulated data, and to upgrade the new information for the development and updating of the management plans for the wetlands.

6. With the availability of the archives, collected during maintaining the “Annals of Nature” on the wetlands, to undertake special works for their processing and assessment of the adaptive capacity of the ecosystems.

7. To develop cooperation with the interested parties for the use of the resources of the wetlands and adjacent areas (as, for example, the “Issyk-Kul” biospheric territory), including cooperation with hunters and local communities.

8. In each of the countries to create a geo-information system of monitoring (GIS-technologies and remote sensing instruments for assessing the state of the wetlands) of the Ramsar Sites with the possibility of withdrawal and integration into a unified

(regional) monitoring system. This, in its turn, will provide an opportunity, for example, to justify the integrated decision-making, aimed at the ecological and economic development of the corresponding territory, like the "Issyk-Kul" biospheric territory in Kyrgyzstan.

9. To use all opportunities to promote information among the users of the information resources on the importance of conserving the wetlands, making use of various mass media and social networks. To develop the works under the environmental projects with young people (schoolchildren, students, etc.).

10. To involve the local population in the tasks of conserving wetlands, taking into account the interests of the local communities, comprising the provision of new opportunities for employment of the local people in the field of tourist recreation, including excursions, bird-watching, wildlife photography, etc.

11. The management plan is a "flagship" document in the wetland monitoring system, as a standard focused on the practical application and obtaining of actual, though reasonable, benefits. Its principles and criteria are aimed at the improvement of the management practices. The principles are the rules, wherefrom one may not deviate in the course of the wetland management, and the criteria are the means of verifying the compliance with these principles. The principles and criteria should encompass and permeate all activities in the wetland management. The management plan should comply with the legislation, regulations and International Treaties, Conventions and Agreements, ratified by the country. The organization (in this case, a protected area), if the wetland is located in its territory, should be a legal entity, which has passed the official documented registration procedure. It is obliged to develop and apply in its practice the appropriate (preventive) measures for the protection against the unauthorized or unlawful use of the wetlands, their biodiversity, and other resources. The management plan for the wetlands should provide the objectively verifiable indicators to assess in general the success of the monitoring and management practices.
12. The ecosystem services of the wetlands are manifold. The parties, interested in them, should include the local communities, which are necessarily involved in using the ecosystem services and protection. This applies especially to the sites of cultural, ecological, economic or spiritual value. At the same time, it is necessary to respect the right of the local communities to protect their traditional way of life. The local communities should be interested in maintaining such representative sites. In case of their violation, the persons responsible for the wetlands together with the local communities should strive to remediate the degraded sites. For example, the experience of the Song-Kul Lake in Kyrgyzstan, when the activities of the local communities have resulted in the destruction of nesting biotopes of bar-headed geese due to the improper cattle grazing, but in the year 1996, the artificial islands for bird nesting have been experimentally created there.
13. Assessment of the wetland practice should be carried out on the basis of the monitoring of the Management Plan implementation and analysis of the monitoring results. The summaries of the results of the MP implementation (see paragraph 8) should be on the open (free) access, as, for example, this is the practice in Kyrgyzstan.
14. A systematic assessment of the criteria in the process of improving the available Wetland Management Plans and their implementation should form the basis for the integrated monitoring, conservation and sustainable use of the wetlands. The interests for

preserving the potential of the Ramsar Sites should be accounted for in the programs of social and economic development of our countries and in the issues of international cooperation.

## 4.3. The principles of the forthcoming planning for the potential Ramsar Sites

Depending on the geographic location and functioning of the wetlands, their management will be different from that of the protected area. Therefore, it is necessary to pay attention to the following two principles:

*The watershed principle*

The planning of the protection and use of the wetlands should be extended to the whole catchment basin, because such wetlands depend, to a large extent, on the water volumes and components of the catchment basin area as an integrated ecosystem.

*The integrated principle*

It is necessary to combine both the active and passive protection of the wetlands, depending on the condition of the catchment basin area, as well as the peculiarities of the reservoir functioning, including its seasonal and annual dynamics. The integrated measures should include the formation of a positive attitude of the local communities to the wetlands, which is determined (as it has been shown above) by the special role of the wetlands in their life. If the wetland is located in whole or in part in the protected area, it is recommended that the Management Plan should account for the environmental value of the given wetland for the relevant ecosystem. Therefore, it is expedient to single out a special Management Plan for the conservation of the given wetland or to designate it separately as a part of the Management Plan of the protected area.

***International obligations under the Ramsar Convention, including those for the countries of Central Asia, make it possible:***

- *To identify and implement the planning of each country in such a way as to contribute to the protection of the wetlands, especially of those being on the Ramsar List, providing a proper supervision. Herewith, to provide an access to the information from the sites in case of changing the ecological status of a particular wetland due to the human-made effect, pollution or other types of anthropogenic pressure.*

- *To provide awareness of the recommendations of the Secretariat and/or the Conferences of the Parties to the Ramsar Convention for the protection, management and sustainable use of the wetlands, their biodiversity and the receipt by them of the obtained information for all interested parties, for all bodies, responsible for the wetland management and officials at all levels.*

At the same time, the tasks of the management of the Ramsar Sites are addressed to the government bodies, which are competent in the sphere of regulation of using the natural resources and/or environmental protection.

*The main requirements of the Ramsar Convention for the management and control of the Ramsar Sites may be summarized in three main groups: 1) to identify and designate such wetlands according to the relevant Ramsar criteria; 2) to develop the Management Plans, providing for a special regime of nature management and contributing to the preservation of the designated purpose of such territories; 3) to exercise supervision over the Ramsar Sites in order to prevent the aggravation of their statuses, whereby they have been nominated.*

Defining the conformity or contradictions between the wetland management practices and the requirements of the Ramsar Convention for the potential wetlands is possible upon obtaining the efficiency (result) assessment of the existing management practices. If the wetland natural complexes are preserved, biodiversity does not decrease, the habitat of waterbird does not degrade this may serve as a reliable indicator of the positive efficiency of the managerial activity. If otherwise, this activity is ineffective and contradicts the requirements of the Ramsar Convention and practices, which are applied, at least, in those Central Asian countries, which have united and established the RRI-CA.

## References

**The Secretariat of the Ramsar Convention, 2007.** The wetland management: management schemes for the Ramsar Sites and other wetlands. Guidelines of the Ramsar Convention for wise use of wetlands, 3rd edition, No. 16. The Secretariat of the Ramsar Convention, Gland, Switzerland (Russian version 2010).

**L. Young Lew, E. Alders Lay, S.L. Sklyarenko et al. 2012.** Guidelines of the Ramsar Convention for the wetlands of Central Asia. Berlin, 112 p.

**Guidelines for integrating wetland conservation and wise use into river basin management Adopted by Resolution VII.18 (1999)** of the Ramsar Convention https://www.ramsar.org/document/guidelines-for-integrating-wetland-conservation-and-wise-use-into-river-basin-management

**Issues for stakeholders to address in achieving sustainable tourism and recreation in and around wetlands (Resolution XI.7, annex 2, 2012)** https://www.ramsar.org/document/issues-for-stakeholders-to-address-in-achieving-sustainable-tourism-and-recreation-in-and

**World Wetlands Day 2 February 2018** - http://www.worldwetlandsday.org/

*For Kazakhstan:*

**Bragin T., Bragina E. (edited by) 2002.** The most important wetlands of North Kazakhstan (within the limits of the Kostanai and North Kazakhstan oblasts). The Russian University, 156 p.

**Globally Significant Wetlands of Kazakhstan. 2007.** v.2. The Tengiz-Korgalzhyn lake system. - Astana. pp. 16-18; v.3. The Alakol-Sassykkol lake system. Astana. pp.15-16.

**Iskakova K.A., Zhakupova A.A., Aktymbayeva A.S., Abdreyeva Sh.T., Aizholova G.R. 2013.** The current state of the recreational potential of the Alakol basin. // Herald of KazNU. Ecological series. No.2/1(38), pp. 60-64.

**Karapun M.Yu., Zaitsev V.F., Obukhova O.V., Yurchenko V.V., Bissekenov T.D. 2009.** Benthic communities of the Karakol lake. // Herald of AHTU. No.2, pp. 11-13.

**Karlykhanov O.K., Kenshimov A.K., Ryabtsev A.D. 2008.** On the hydro-ecological situation in the lower reaches of the Syr Darya river. // Water management in Kazakhstan. No.3(19), pp. 24-29.

**Kovshar V.A. 2006.** The Kyrgalzhyn State Nature Reserve. // The Reverses and National Parks of Kazakhstan (prepared by A.A .Ivashchenko). Almaty: Almatykitap LLP. pp. 126-137.

The Red Data Book Of the Republic of Kazakhstan. 2010. v.I. Animals. Part 1. Vertebrates / The fourth edition, revised and enlarged. Almaty. 316 p.

**Nurgizarinov A.M. 2006.** Ecological breath of Aral (in Kazakh). Almaty: Galym. 223 p.

**Sklyarenko S.L., J. Welsh, M. Bromhaber (edited by). 2008.** The Important Bird Areas of Kazakhstan. Almaty: ACBK. 297 p.

The Works of the Alakol State Nature Reserve. 2002. v.2.(prepared by N.N.Berezovikov). Almaty: Tethys. 252 p.

*For Kyrgyzstan:*

**Azykova E.K. 1979.** Natural complexes of the shore area of the Issyk-Kul lake. – Frunze, pp. 104-156.

**Vorobiyov G.G., Kulagin V.M, Kulagin S.V. 2002.** The Birds of the Issyk-Kul lake and its shores (Materials of the monitoring from 1964 to 1998). Bishkek, 173 p.

**Davletbakov A.T. 2009.** The Important Bird Areas: "the Chtyr-Kul lake", Bishkek, p.3.

The Red Data Book of the Kyzgyz Republic, the second edition, Bishkek, 2006, 534 p.

**Kulagin S. v. 2009.** The Important Bird Areas: "the Song-Kul lake", Bishkek, pp. 4-6.

The Management Plan for the Issyk-Kul State Nature Reserve. 07.06.2017. No.01-9/132

The Management Plan for the Karatal-Japyryk State Nature Reserve. 24.06.16. No.01-9/173.

**Sobolev L.N. 1972.** Essay on the vegetation of the Issyk-Kul basin. - Frunze: Ilim. 108 p.

**Shnitnikov A.V. 1980.** Issyk-Kul lake // The Tien Shan lakes and their history. - L.: Nauka, - pp. 5-66.

**Shukurov E.D. 1990.** Ecological-geographical outline of the Issyk-Kul basin. – Frunze: Ilim. - 36 p.

**Yanushevich A.I. 1976.** Migrations of birds in Kirghizia // Migrations of birds in Asia. // Alma-Ata: Nauka. pp.156-165.

*For Turkmenistan:*

**Vassiliyev V.I.,Rustamov E.A.., Gauzer M.E. 2009.** Monitoring of the number of waterfowl on the Turkmen coast of the Caspian Sea in the autumn-winter period (1971-2005). M. 64 p.

**Zonn I.S. 2004.** The Caspian Encyclopedia. M.: Mezhdunarodnye otnosheniya. 461 p.

**Zonn I.S., Zhiltsov S.S. 2004.** The Caspian region: geography, economics, politics, cooperation. M.: Edel-M. 638 p.

**Issakov Yu.A. 1940.** Ecology of wintering of waterfowl at the Southern Caspian Sea // The Works of the All Union Wildfowl Reserve Gassan-Kuli. Issue 1, M. pp. 160-238.

**Issakov Yu.A., Vorobiyov K.A. 1940.** Overview of wintering and transit of birds at the Southern Caspian Sea // The Works of the All Union Wildfowl Reserve Gassan-Kuli. Issue 1, M. pp.5-159.

**Kassymov A.G. 1987.** The Caspian Sea L.: Gidrometeoizdat, 157 p.

**The Red Data Book of Turkmenistan. 2011.** v.1-2, the third edition, revised and enlarged. Ashgabat: Ylym. 384 p.

**Nuryyev A.T, Berdyyev B.R., Rustamov E.A., Shcherbina A.A. 2008.** The Hazar State Nature Reserve. Ashgabat, 35 p.

**Rustamov A.K. 2013, 2015.** The Fauna of Turkmenistan and its protection. Ashgabat: Ylym. Revised and enlarged edition, PDF-version (http://zmmu.msu.ru/menzbir/publ.htm).

**Rustamov E.A., J.Welsh, M. Brombacher (edited by). 2009.** The Important Bird Areas of Turkmenistan. Ashgabat: MOP. 197 p.

**Essenov P., Saparov U.B. 2006.** An analysis of the state of the aquatic ecosystems of Turkmenistan. // Problems of conservation of ecosystems of the inner waters of Central Asia and South Caucasus. Almaty - Tashkent. pp. 48-54, 122-128.

**Authors-compilors**

1. **Davletbakov A.T.** – Head of the Laboratory of Zoology of Vertebrate Animals of the Institute of Biology and Soil of NAS KR, candidate of biological sciences (Sections 1.5 and 3.2)
2. **Kozybakov A.M.** – Head of the "Koldau-Ecology" Specialized Center of the "Koldau-Kazakhstan" Multidisciplinary Non-Profit Holding (Sections 1.5 and 3.1)
3. **Rustamov E.A.** – Chairman of the Coordination Committee of the Ramsar Regional Initiative for Central Asia – CC RRI-CA (Summary, Introductory part, Sections 1.5, 2, 3.3 and 4).

# Attachment

*Form of the Questionnaire for survey of the representatives of the local communities (approved at the Working Seminar of the RRI-CA, Almaty, May 11, 2017)*

QUESTIONNAIRE

(a survey of the local communities on the state of the wetland and its protection)

Name of the wetland:

Populated locality:

The survey is carried out by (Full name):

1. Do you know what a RAMSAR WETLAND is?

○ yes ○ no

2. How long do you know of this wetland?

○ no more than 5 years; ○ 6-10 years; ○ 11-15 years; ○ more than 15 years

3. What is the value of this wetland in your opinion? (select 2-3 variants)

An important source of income for people ( )

An important source of food for people ( )

An important source of water for people ( )

An important habitat and migration place for birds ( )

A place of protection of the important animal and plant species ( )

A place for fishing and hunting ( )

An important place of recreation for people ( )

A place of excursions and field practices for schoolchildren and students ( )

1. What effect is produced upon this wetland, in your opinion, by the following factors?

| | Negative | Positive | Unknown |
|---|---|---|---|
| Increasing of cattle-breeding | | | |
| Tourism | | | |
| Construction of new enterprises | | | |

| | | | |
|---|---|---|---|
| Development of settlements | | | |
| Change in salinity | | | |
| Water intake | | | |
| Agricultural effluents | | | |
| Silting | | | |
| Drainage of lands | | | |
| Shut-off / regulation of the water regime | | | |
| Desertification | | | |
| Introduction of animal and plant species | | | |
| Mining | | | |
| Other factors (specify): | | | |

5. What kind of benefit do you usually draw from this wetland?

_____

6. Do you or your acquaintances use this wetland for hunting or fishing?

- ○ yes, including poaching
- ○ yes, but only within the bounds of the law
- ○ no

7. Is the level of hunting and fishing control sufficient, in your opinion, on your wetland?

- ○ yes, it is at the highest level
- ○ yes, it is at the medium level
- ○ no

8. Appraise the degree of cleanliness of your reservoir and its shores by points from 1 to 5 (1 – the reservoir is polluted very much, 5 – the reservoir is in the excellent condition)

| | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

9. Are the actions for cleaning the shores and water carried out on your wetland?

○ yes, regularly

○ yes, but not regularly

○ no

10. Would you take part in the actions for cleaning the shores and water?

(please explain your answer) _____

11. What kind of measures could you propose for the wetland conservation?

_____

12. What changes have happened to the wetland over the recent decade?

_____

13. What kind of information sources do you use to know the news about the wetland?

○ television

○ newspapers

○ Internet news sites

14. Is this information sufficient for you?

○ yes

○ no

15. Where else would you like to receive the news of the wetland?

_____