

RUSSIAN FEDERATION

Lake Baikal

Brief description

Situated in south-east Siberia, the 3.15-million-ha Lake Baikal is the oldest (25 million years) and deepest (1,700 m) lake in the world. It contains 20% of the world's total unfrozen freshwater reserve. Known as the 'Galapagos of Russia', its age and isolation have produced one of the world's richest and most unusual freshwater faunas, which is of exceptional value to evolutionary science.

1. Introduction

Year(s) of Inscription

1996

Agency responsible for site management

- Ministry of Natural Resources
4/6, Bolshaya Gruzinskaya,
123812 Moscow, Russian Federation
E-mail: mzlv@mnr.gov.ru
Website: www.mnr.gov.ru

2. Statement of Significance

Inscription Criteria

N (i), (ii), (iii), (iv)

Justification provided by the State Party

The Lake Baikal and adjacent territories belong to the central part of the rift zone which developed since the Mesozoic period till the present time. A similar zone exists in the African Rift Valley. The Lake Baikal formed about 20 million years ago and is presently the oldest lake on earth. The Baikal rift system belongs to the system of hollows of the type of global scale rift grabens. The biggest element of this system is the gigantic tectonic hollow of the Lake Baikal which continues to grow approximately 1.5 cm a year. The Lake Baikal is surrounded by mountain ridges of the height of up to 2000 m above its level. The bottom of the lake is almost 1200 m below the sea level. The thickness of the bottom deposits exceeds 6 km (Criterion i).

Among the geological points of interest of the region are also extinct volcanoes, caves, relic landslide cirques, abrasion caverns, singing sands. The archaic stage of geological history left its marks in the edge strip of the Siberian platform and the adjacent plicate belt of baikalides. A repeated displacement of masses along the

fractures took place while the first fractures appeared on the verge of the archaic and proterozoic periods, i.e. about 1.5- 1.7 billion years ago. The forming of the geological structures took place during the Paleozoic, Mesozoic, Cenozoic periods. The geological transformations are continued by the present seisms. Thus, fresh tectonic cracks have recently been discovered in mountain ranges surrounding the Baikal type depressions (criterion ii).

Having a maximum depth of 1638 m Baikal is the deepest lake in the world. The water of the lake is exceptionally transparent (up to 40 m), it has an insignificant content of soluble substances (mineralization is of about 100 mg/l), it is rich in oxygen, the content of which does not go below 9 mg/l. All this permits to consider Baikal "the waterwell of the planet". Baikal reproduces high quality fresh water, which flows into it from 365 rivers - and processes it during a year. The self purification has many natural factors but the main one is the bio-hygienic factor. This is a unique property of the lake.

Unique picturesque landscapes of boreal type, mountain forests, steppes, tundra, mountain complexes are characteristic for the territory of the Baikal basin occupying the area of 32 mln ha. The variety of the plants of the basin of the Lake Baikal is determined by its climatic asymmetry: the western part of the basin is occupied by light coniferous forests, mountain steppes, drought resistant grasses. In its eastern part predominate pine forests, in the north it is covered by deciduous forests. It is these landscapes that are the most important elements of the eco-system of the region. The natural beauty of the Baikal basin is as important as the Grand Canyon, the Amazon forests. The Baikal basin has more than 30 hot springs and more than 300 mineral water springs: sulfuretted hydrogen, carbonaceous, alkaline, carbonaceous ferric, sulfate, alkaline-Glauber, radioactive.

Along with natural wealth (water, forest, mineral raw materials) the basin of the Lake Baikal is distinguished by landscapes of unusual beauty. There are about 300 monuments of nature there: geological, water, botanical, zoological, natural history, landscape. Natural phenomena include water falls, glaciers, relic mud flow river drifts, swellings, healing muds sites. Among beautiful landscapes areas of original biocenoses can be found, amassments of boulders. Apart from unique properties of Baikal what is important is its emotional impact through the purity of its waters, the contrasts of steep, green shore line and the

colourful outcrop of various rocks against the background of the lake and the sky.

Numerous natural history, ethnographic, cult monuments are preserved here. The history and culture of North Asia are massively and variously represented, monuments of initial exploration of Siberia by Russians are preserved. One of the most interesting factors of cultural heritage is the traditional culture of the Buryats and the Evenks which represents an experience of caring human attitude to nature. Of great interest are settlements of old believers, Buddhist shrines and orthodox churches, monasteries. Holy places are often located in remote territories with water falls, peaks, canyons and exemplify interaction of nature and civilization. The cultural heritage of the Baikal region is as important as are the ruins of Troja, the monuments of the culture of ancient Etruscans, Maya, Incas and thus constitutes not only the national wealth of Russia but represents a unique value for the entire humankind (criterion iii).

Unlike the waters of the Tanganyika lake in East Africa, the second's largest and oldest lake of the world, the waters of the Lake Baikal are rich with oxygen even in the profoundest depths. It enables the fishes to populate all the layers of the lake waters. Two thirds (more precisely 2630 species) of living organism found in the Lake Baikal are not found anywhere else in the world. Of special interest are large sponges, similar to sea sponges that grow both in shallow and in deep waters. Among the most interesting invertebrate animals are amphipods who developed as species in the lake itself. About 80% of all known in the world species of fresh water amphipods live in the Lake Baikal. One of the amphipods is a pelagic predator feeding on mesozoplankton - *Macrohectopus branickii*, who migrates vertically.

Fifty two different species of fishes live in Baikal. In old Siberian songs the Lake Baikal is called "omul barrel" because five populations of omul (*Coregonus*) live here: *Selenginskaya*, *Chivyrkuiskaya*, *Severobaikalskaya*, *Barguzinskaya*, *Posolskaya*. A unique group of deep water fishes of the *Comephoridae* family populate the cold dark depths of the lake. Among endemics is a viviparous fish *Golomianka* *Comephorus Baicalensis* - a small big-mouthed scaleless fish whose light pink body is so transparent that through its tail portion one can read a printed text like through a piece of glass. The most outstanding element of the fauna is the endemic Baikal seal *Phoca sibirica*, whose ancestors were apparently arctic seals who arrived

to the Lake Baikal through the Yenisei and Angara rivers.

The animal world of the basin of the Lake Baikal is represented by a great variety of species typical for mountain forests, steppes, tundra. For the mountain forests of the basin are characteristic brown bears (*Ursus arctos* L), Siberian roe deer (*Capreolus Capreolus* L), chipmunks (*Tamias sibiricus* L.), gluttons (*Gulo Gulo* L), sables (*Martes zibellina* L), squirrels (*Sciurus vulgaris* L). In the steppes of the basin are found numerous long-tiled gophers (*Citellus undulatus* Pall) and foxes (*Vulpes vulpes* L). In the tundra common are polar gray partridge (*Lagopus lagopus* *Perdix perdix*), northern and noble deer (*Rangifer tarandus*, *Cervus elaphus* L), forest lemmings (*Myopus schisticolor* Lill). Among rare and extincting species are found *daurskii* hedgehog (*Erinaceus (Hemiechinus) dauricus*), hare-tolai (*Lepus Proeulagus tolai*), Chinese field-vole (*Lasiopodomys mandarinus*), Siberian kabarga musk deer (*Moschus moschiferous* L), manul (*Felis (Otocolobus) manul*), falcon-sapsan (*Falco peregrinus*), Siberian mountain goat (*Capra (Ibex) sibirica*), black stork (*Grus monacha*). Baikal is situated at the crossroads of seasonal migration routes of birds and mammals. In the basin of the lake grow more than 30 rare and extincting plants. Among them are large flowered, regular, spotted "Venus' shoe" (*Cypripedium macrantron* Sw, *Cypripedium calceolus*, *Cypripedium maculates*), juniper club-moss (*Lycopodium Juniperusum*), curly lily (*Lilium martgon*).

In order to preserve wild nature scientific research on the national natural heritage of the basin of the Lake Baikal is continued (criterion iv).

As provided in IUCN evaluation

EVALUATION

LB presents a classic case for a World Heritage site meeting all four natural criteria. The Lake itself is the centrepiece of the site and it is its largely unseen underwater features that are the core of its value to both science and conservation. The surroundings of the lake with its taiga-clad mountain scenery and wildlife resources still mostly existing in a natural state is an added bonus. LB is in a class by itself, a limnological wonder and a region of superlatives:

- The geological rift system which gave rise to LB was formed in the Mesozoic period. LB is thus the oldest lake in the world as well as the deepest. Various tectonic forces are still on-going as evidenced in recent thermal vents in the depths of the lake (criterion i).

- The evolution of aquatic life that has taken place over this long period of time has resulted in an exceptionally unique and endemic fauna and flora. LB is the "Galapagos of Russia" and is of exceptional value to evolutionary science (criterion ii).

- The picturesque landscape surrounding the LB depression with mountains, boreal forests, tundra, lakes, islands and steppes provide an exceptionally scenic setting. The single largest reservoir of freshwater on earth (20% of the world's total) is found here which is an additional superlative phenomenon (criterion iii).

- LB is one of the most biodiverse lakes on earth with 1340 species of animals (745 endemic) and 570 species of plants (150 endemic). In the forests surrounding the lake there are an additional ten IUCN Red Data Book threatened species along with the full complement of typical boreal species (criterion iv).

IUCN is concerned, however, that there are serious threats to the biotic communities in Lake Baikal and that there is a danger that its unique ecosystem properties could be lost. To address these issues of integrity, various steps are being taken to reduce these threats and there is strong support by all levels of government and the Russian public to implement the required actions. The property is of substantial size with a buffer zone around it. Policies and structures and laws are either in place or are in the advanced stage of approval. Valid concerns regarding conditions of integrity were expressed by the Bureau. Due to recent changes in the administration of nature conservation within the Russian central government it has not been possible for a detailed statement on when the Law is expected to pass and which other measures will be undertaken. Based, however, on direct discussions with senior central and regional government representatives during the field mission in June, IUCN suggests that the best interests of conservation of LB would be served if the Committee would act on the nomination at this time. RECOMMENDATIONS: Lake Baikal with the 8.8 mil. ha. boundary as described in section 4, meets all four natural criterion and should be inscribed on the World Heritage List. The Committee should underline to the Russian authorities the importance of (1) final passage of the Federal Law on the Protection of Lake Baikal; (2) conversion of the pulp and paper mill at Baikalsky to eliminate it as a pollution source; (3) the initiatives of the authorities to continue to reduce pollution loads in the Selenga River; (4) providing more resources to the management of the nature reserves and national

parks surrounding the lake; and (5) continuing and further supporting the research and monitoring activities on the Lake.

Committee Decision

Bureau (June 1996): The Bureau took note of the oral report provided by IUCN. The Bureau decided to refer the nomination back to the State Party to allow it to (1) confirm the revised boundaries of the core area proposed for inscription, and (2) provide information about the status of the special Lake Baikal Law. Furthermore, the Bureau requested IUCN to submit a written evaluation. On the condition that this information is provided by 1 September 1996, in time for the twentieth extraordinary session of the Bureau, the Bureau recommended the Committee to inscribe the nominated property as the most outstanding example of a fresh water ecosystem on the basis of criteria (i), (ii), (iii) and (iv).

Bureau (December 1996): The Bureau recommended the Committee to inscribe Lake Baikal as an outstanding example of a freshwater lake on the basis of criteria (i), (ii), (iii) and (iv). It is the oldest and deepest of the world's lakes containing nearly 20% of the world's unfrozen freshwater reserve. The lake contains an outstanding variety of endemic flora and fauna, which is of exceptional value to evolutionary science. It is also surrounded by a system of protected areas that have high scenic and other natural values. The Bureau took note of the confirmation of the revised boundaries of the site, which correspond to the core areas defined in the Baikal Law (excluding the five urban developed areas). It also noted that the special Lake Baikal Law is now in its second reading in the Duma. It noted finally concern over a number of integrity issues including pollution which should be brought to the attention of the Russian authorities.

Session (1996): The Committee inscribed Lake Baikal as the most outstanding example of a freshwater ecosystem on the basis of natural criteria (i), (ii), (iii) and (iv). It is the oldest and deepest of the world's lakes containing nearly 20% of the world's unfrozen freshwater reserve. The lake contains an outstanding variety of endemic flora and fauna, which is of exceptional value to evolutionary science. It is also surrounded by a system of protected areas that have high scenic and other natural values. The Committee took note of the confirmation of the revised boundaries of the site, which correspond to the core areas defined in the Baikal Law (excluding the five urban developed areas). It also noted that the special Lake Baikal

Law is now in its second reading in the Duma. Finally, it noted concern over a number of integrity issues including pollution, which should be brought to the attention of the Russian authorities.

- Statement of Significance adequately defines the outstanding universal value of the site
- No change required by State Party
- UNESCO's official description is not satisfactory. State Party presented in the Periodic Report the detailed proposal for the modification of description

Boundaries and Buffer Zone

- Status of boundaries of the site: inadequate. There is a need of approval of the boundaries of Baikal Natural area and its ecological zones in conformity to the Federal Law "On the Protection of Lake Baikal"
- Buffer zone: adequate
- No change to buffer zone has been proposed by State Party

Status of Authenticity/Integrity

- World Heritage site values have not been maintained. There have not been any significant changes to the authenticity/integrity of the site since inscription. In the meantime, the pollution due to the industrial development pressure might affect in the future the authenticity/integrity and Outstanding Universal Value of the property

3. Protection

Legislative and Administrative Arrangements

- Russian-Mongolian Agreement on protection and transboundary water use
- The Federal (framework) Law "On the Protection of Lake Baikal"
- Governmental Resolutions: "On Ecological Zoning of the Baikal Natural Area and On Informing the Population About the BNA Boundaries, its Ecological Zones and Regulations of Ecological Zones", "On Confirmation of the List of Prohibited Activities in the BNA Central Ecological Zone", "On Water Level Limits of Lake Baikal in the Course of Economic Activities", "On Specifics of Conservation and on Catch of Lake Baikal Aquatic Endemic Animals and Gathering of Aquatic Endemic Plants", "On Confirmation of the Federal Program *Ecology and Natural Resources of Russia*"; The Strategy for the Preservation of the Biodiversity of Lake Baikal"

- The protection arrangements are considered sufficiently effective

Actions proposed:

- Adoption of relevant governmental enactments in conformity with the framework Law "On the Protection of Lake Baikal"

4. Management

Use of site/property

- Visitor attraction, national park/protected area

Management /Administrative Body

- Steering group has not been set up
- Site managers on full-time basis (number of institutions for different components of the property)
- Levels of public authority who are primarily involved with the management of the site: national, regional, local
- The current management system is sufficiently effective

Actions proposed:

- Coordination of the activities of all stakeholders to be improved at all levels

5. Management Plan

- No management plan
- Plans for the protection and rational use of natural resources have been elaborated for the Baikal basin; the Selenga river basin; and for water treatment and sanitation of the communities and recreational areas in the Central Ecological Zone of Lake Baikal
- Responsibility for over-seeing the implementation of the management plan and monitoring its effectiveness (when prepared): Governmental Commission for the Lake Baikal (to be established in the future)

6. Financial Resources

Financial situation

- State Budget (federal and regional): especially for the State subprogramme "Protection of Lake Baikal and Baikal Natural Area"
- WHF: 1990, 1998, 1999
- Bi-lateral: N/A
- Funding is insufficient

7. Staffing Levels

- Number of staff: not provided

Rate of access to adequate professional staff across the following disciplines:

- Good: education
- Average: conservation, management, promotion, interpretation
- Bad: visitor management

8. Sources of Expertise and Training in Conservation and Management Techniques

- Siberian Institute of Physiology and Biochemistry of Flora; Institute of Geography of the Siberian Dept of the Russian Academy of Sciences; Institute of Geochemistry of the Siberian Dept of the Russian Academy of Sciences; Institute of Epidemiology and Microbiology of the scientific Centre of Medical Ecology of the Eastern Siberian Scientific Centre of the Russian Academy of Medical Sciences; Baikal Regional Information and Analytical Centre
- No training opportunities on site management

9. Visitor Management

- Visitor statistics: not provided
- Visitor facilities: museums, libraries, exhibitions, guides, botanic garden, visitor centres, tourist and transport infrastructure
- Further development of tourist infrastructure is needed

10. Scientific Studies

- Numerous researches dedicated to the risk preparedness, warning and mitigation of natural disasters; Numerous researches of the ecosystem; studies dedicate to the threats due to the pollution; Everyday monitoring exercises; Inventory and information systems including GIS "Baikal: Hydropoints"
- Inventory and evaluation of socio-economic conditions, actual land-use management and nature components of the Olkhon District

11. Education, Information and Awareness Building

- No signs referring to World Heritage site
- World Heritage Convention Emblem is not used on publications
- Adequate awareness of World Heritage among: visitors, local communities, local authorities

- Need for awareness raising: organisation of media campaigns and production of promotional materials
- The Baikal Day
- Web site available: www.geol.irk.ru
- No measures have been taken to involve local people in the management of the property

12. Factors affecting the Property (State of Conservation)

Reactive monitoring reports

- World Heritage Bureau sessions: 21st (1997); 22nd (1998); 23rd (1999); 24th (2000); 25th (2001); 26th (2002)
- World Heritage Committee sessions: 21st (1997); 22nd (1998); 23rd (1999); 24th (2000); 25th (2001); 26th (2002); 27th (2003); 28th (2004); 29th (2005); 30th (2006)

Conservation interventions

- Conservation, restoration works: not provided
- Present state of conservation: State Party described in the Periodic Report the present state of conservation as "needs more resources", while Committee considering the possibility of inscription of the property on the List of World Heritage in Danger, expressed its serious concerns in connection with existing serious conservation issues

Threats and Risks to site

- Development pressure, environmental pressure; natural disasters, tourism pressure, excess hunting/fishing
- Emergency measures taken: the State programme "Protection of Lake Baikal and the Baikal Natural Area" has been developed; the works on waste products management and burial of industrial/consumption wastes, bank protection, cleaning-up of beds of minor rivers, adaptation of low-waste and non-waste technologies have been outlined; the project entitled "Creation of a fully closed water management system for Baikalsk pulp and paper mill" has been prepared

13. Monitoring

- Formal monitoring programme has been established and wide-scale monitoring researches have been implemented
- In accordance to the Governmental Resolution n°177 (2003) the Ministry of Natural Resources is responsible for the overall monitoring exercise

- Key indicators: not provided

14. Conclusions and Recommended Actions

- Main benefits of WH status: conservation, management
- Strengths of management: site-specific legislative provisions have been taken; pollution decreased; monitoring exercise improved; numerous scientific studies have been implemented
- Weaknesses of management: lack of political will to protect the property from the threats of development pressure; lack of funding; no management plan; weak management system; inadequate boundaries