

Information Sheet on Ramsar Wetlands (RIS) – 2006-2008 version

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

Notes for compilers:

1. The RIS should be completed in accordance with the attached *Explanatory Notes and Guidelines for completing the Information Sheet on Ramsar Wetlands*. Compilers are strongly advised to read this guidance before filling in the RIS.
2. Further information and guidance in support of Ramsar site designations are provided in the *Strategic Framework and guidelines for the future development of the List of Wetlands of International Importance* (Ramsar Wise Use Handbook 7, 2nd edition, as amended by COP9 Resolution IX.1 Annex B). A 3rd edition of the Handbook, incorporating these amendments, is in preparation and will be available in 2006.
3. Once completed, the RIS (and accompanying map(s)) should be submitted to the Ramsar Secretariat. Compilers should provide an electronic (MS Word) copy of the RIS and, where possible, digital copies of all maps.

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

V.A. Andronov, R.S. Andronova. Khabarovsk, PO box 105-26, 680030 Russia

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Designation date

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Site Reference Number

2. Date this sheet was completed/updated:

September 2008

3. Country:

Russian Federation

4. Name of the Ramsar site:

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

Lake Bolon and the Mouths of the Selgon and Simmi Rivers (No. 686)

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

This RIS is for (tick one box only):

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

6. For RIS updates only, changes to the site since its designation or earlier update:

a) Site boundary and area

The Ramsar site boundary and site area are unchanged:

or

If the site boundary has changed:

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

and/or

If the site area has changed:

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

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

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

No major changes to the ecological character identified.

7. Map of site:

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

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

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

b) Describe briefly the type of boundary delineation applied:

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

The Statute and borders of the Ramsar wetland were adopted by the Head of the Khabarovsk Krai Administration (Decree No. 6 from January 4, 1996).

Borders of the site follow physical boundaries (natural objects) and administrative boundaries. In preparation of the previous RIS for the Ramsar site (1997), its borders were described schematically, which resulted in an inaccurate determination of the borders and the site area. Therefore, the description of the site's borders and its area should be improved.

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

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

49° 35' N, 136° 05' E.

9. General location:

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

Northern part of the Middle Amur Plain, the middle reach of the Amur River. The site is located 45 km of the town of Amursk, the administrative center of the Amursky district of the Khabarovsk Krai. 140 km south-west from the province center, the city of Khabarovsk. The nearest settlements are the villages of Dzhuen and Achan that are located at the northern shore of the lake.

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

3.5 to 8.0 m a.s.l. on the floodplain and 20 to 25 m a.s.l.

11. Area: (in hectares)

53,800 ha

12. General overview of the site:

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

The site comprises part of Lake Bolon; deltas of its tributary rivers the Kharpi and Simmi with a group of small floodplain lakes, oxbow lakes, and bays; and the middle course of the Simmi River. It is the largest concentration of wetland and meadow habitats in the Lower Amur area. The site is located on a major migration route of birds that fly from South-East Asia, including India, along the ecological corridor following the Amur River; typical is a great species diversity of waterbirds and shorebirds. Spawning and feeding grounds of the Amur fishes and summer habitat stations of the elk and roe deer.

13. Ramsar Criteria:

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

1	•	2	•	3	•	4	•	5	•	6	•	7	•	8	•	9
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14. Justification for the application of each Criterion listed in 13 above:

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

Criterion 1. The site is a representative example of a near-natural wetland complex in the Lower Amur area.

Criterion 2. The site supports populations of rare and endangered species of birds listed in the Red Book of the Russian Federation, including: the Japanese Crane (*Grus japonensis*), Oriental Stork (*Ciconia boyciana*), White-tailed Eagle (*Haliaeetus albicilla*), Steller's Sea Eagle (*Haliaeetus pelagicus*), Lesser White-fronted Goose (*Anser erythropus*).

Criterion 3. The site supports biocenoses that are important for maintaining reproduction of rare species of plant and animal.

Criterion 5. The site plays one of the most important roles in the system of specially protected areas for shorebirds of the Russian Far East and North-East Asia as a whole. One can legitimately suppose that the modern key role of the Lower Bolon area in the system of waterbird migrations has sustained during the whole post-glacial period, and the maintenance of a favorable environment in the region should largely provide the survival of many North and East Asian populations of anseriformes and shorebirds (Антонов 2004).

The site comprises mass breeding grounds of waterbirds and shorebirds typical of the Middle Amur area (138 species, 25% of the total number of waterbirds in the Khabarovsk Krai) and supports large aggregations of wetland birds during migrations and summer moulting. According to rough estimates, over 10,000 Whooper Swans, tens of thousands of geese, and over 100,000 of various ducks use it as a stopover and feeding site during migration (Тягунин, Никитина 2006).

Criterion 8. The site supports spawning and feeding grounds of fishes that come up the Amur.

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

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

a) **biogeographic region:** Southern broadleaf forest

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

A.A. Tishkov. Biosphere functions of natural ecosystems in Russia. 2005. 309 p.p. in Russian.

a) **biogeographic region:**

The site falls into the Amur-Ussuri natural region and belongs to the Middle Amur flatland ecoregion.

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

The site falls into the Amur province of the East Asian conifer-deciduous geobotanic region (Kolesnikov 1963). However, due to a specificity of natural conditions, the area is not forested. Predominant vegetation types are meadows and mires that cover over 80% of the area (Shlotgauer 2002). According to the zoogeographic regionalization by A.I. Kuznetsov (1969), the site belongs to the Ussuri-Amur province of the Amur (Manchurian) fauna. However, open-area faunas of the Amur region and East Siberia are present there too.

16. Physical features of the site:

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

The site is located on the northern portion of the Middle Amur Plain. Major landforms are lacustrine-alluvial and alluvial floodplains and upper terraces of the Amur, its tributaries and floodplain lakes. The Bolon floodplain is built of modern riverine and lacustrine alluvium underlain by loose older Cenozoic deposits. General slopes of the surface towards Lake Bolon are very gentle (below 0.002 m) and cannot be detected visually. It is the region's youngest and lowest portion of the Middle Amur Plain composed of predominantly low river terraces and waterlogged tracts. The upper floodplain formed by the surfaces of the first and second terraces occupies the area between the Amur, its tributaries, and lakes. A small island of Yadasen located in the northwest portion of the lake is a cinder cone of a tertiary volcano with an absolute elevation of about 35 m (Аваряскин 1970а; Никонов, Анисимова 1974). Originally, Bolon is a natural floodplain lake presenting a remaining part of the ancient riverbed of the Amur River (Аваряскин 1970а).

Primary conditions of soil formation are following: 1) a relatively limited entry of low-ash organic remains to the soil or their rapid decomposition (with the exception of bog soil); 2) formation of predominantly aggressive acids in the humification process; 3) soil forming bedrocks being poor in alkalis; 4) regular or steady filtration of water through the soil and removal of soil formation products (with the exception of bog soil); 5) specific microflora (mainly fungi and actinomycetes) adapted to striving in an acidic environment that is poor in alkalis. Geomorphologic features, soil formation conditions, peculiarities of hydrophysical properties of soils and hydraulic regimes show that plakor or eluvial landscapes in terms of water exchange should be divided to those with a free, slightly inhibited, and inhibited water exchange characters. Soils of the landscapes with an inhibited water exchange include peat and peat-gleyed soils on lower ridges (with larch and ledum communities) and low floodplain soils. These landscapes usually show a pronounced patterned structure of soil and vegetation cover associated with micro and nano-relief, which has to do with irregularities in soil forming rocks, long periods of frost, and vegetation types. Soil types of terraces and floodplains are especially widespread on flatland stretches. Typical of terraces are meadow podbel and forest podbel soils, floodplain brown earths, and bog soils. Meadow podbels (meadow gleyic soils) occur on expansive low lacustrine alluvial terraces. Forest podbels (brown podzolic soils) are formed on upper lake and river terraces, in gently sloping massifs of larch and birch forests, on heavy clay loams. They have acidic and subacid reactions and are rich in alkalis. Brown floodplain soils are found on first upper floodplain terraces of tributary rivers flowing to Lake Bolon and the Simmi River that are built of sandy alluvium and covered with floodplain forests. Bog soils (peatlands, peat-gleyic and peaty-gleyic soils) are widespread on lower river and lake terraces as well as on flat, poorly drained watersheds. Peat in most peatland massifs is decomposed, with an ash content of over 30%. Floodplain soils cover expansive areas in the valleys of tributary rivers flowing to the Simmi River

and Lake Bolon. They are represented by floodplain meadow, floodplain fibrous, and floodplain bog soils. The floodplain bog soils are formed in the bottoms of drying oxbow lakes and around floodplain lakes covered with *Calamagrostis* – *Carex hummocky* meadows (Соловьев 2006).

Peatlands are expansive, covering nearly 80% of the site's area, and vary in moisture conditions. Elevated or well-drained stretches of the plain support small tracts of forest and shrub vegetation. *Relka* ridges are usually up to 400 m long and 100 m wide, with absolute altitudes varying between 3.5 and 8.0 m.

Climate is continental type with some monsoon traits. Arctic continental air masses dominate in winter, which is cold, with mean air temperatures of January fluctuating between – 25 °C and – 28 °C. Dense cloudiness in the warm season of the year, a prolonged cold season, and relative proximity of the cold Sea of Okhotsk result in low heat values (Мищенко и др. 1994). The summers are moderately warm, with mean July temperatures of + 18 °C to + 20 °C, and exceedingly wet in the second half. The frost-free period lasts for 135 to 160 days, while the snow cover lasts for 160 to 170 days. Annual variations of air temperature reach 48 to 50 °C. Mean annual precipitation is 656 to 790 mm, of which 80-90% fall during the warm season. The greatest mean depth of the snow cover is 36 cm, but it can reach 58 cm in some years. The snow cover is one of the most important ecological factors that determine distribution of animals in winter.

17. Physical features of the catchment area:

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

The Middle Amur Plain is characterized by a high moisture content caused by poor drainage. The flow rate (discharge per unit area) measures 506 l/km² in the center of the plain. The runoff coefficient (ratio between runoff and precipitation) is below 0.3. Mean monthly moisture content (ratio between precipitation and evapotranspiration) is 1.74, varying from 0.97 to 3.24 in September (Кадастровые сведения...2007).

Lake Bolon is a principal landscape element of the site. Judging from its features, it can be assigned to relict lakes. The lake is 53-58 km long and 20-23 km wide. The water surface area covers 338 sq. km (Хабаровский край: путеводитель). Mean depth of the lake during summer low-water season is 2.5 m, its variations (4.5 to 5 m) being largely determined by water level variations of the Amur. Maximal registered variation span was 7.36 m. In the warm season, the water level fluctuates gently in accordance with that in the Amur. When water levels reach about 230 cm in Lake Bolon and 120 cm in the Amur, the fluctuations of water tables in the lake and in the river lose their synchronism, and the lake enters a prolonged low-water period (Кадастровые сведения...2007). Mean capacity of the lake is 0.25 sq. km (Кадастровые сведения...2007). Bolon is a drainage lake. The water flow is reversible. A complete renewal of water takes place in 31 days. It has favorable hydrobiological conditions for the aquatic ecosystem. In April, water level rises to 200 cm above datum plane (in Dzhen), and the lake enters a stable position affected by the Amur. As the Amur swells in August and September, water level in the lake increases greatly, which results in flooding of tens of kilometers of the shore. Waters of the lake and the Amur join during greatest floods (2-5% of exceedance probability) (Кадастровые сведения...2007). The water level is low in winter; the lake can freeze to the bottom in some years, except for a few stretches.

The southwest shore of Lake Bolon is unstable and low; the north and east shores are hilly, with pediment terraces at 12-15 and 20-25 m. 49 watercourses flow into the lake, its northeast extremity being directly linked to the Amur. In the Lower Quaternary Age, a huge basin of lakes and rivers with a water level of up to 110 m was situated where is now Lake Bolon. Repeated fluctuations of the erosion baselevel took place during the Quaternary Age, which resulted in the formation of a series of terraces. After the upheaval of the plain, most of it was free of water. The retreat of Lake Bolon to its modern boundaries and contraction of its floodplain along the tributaries of the lake brought about a characteristic sequence of paludification of the adjacent area. Upper floodplain terraces of the Simmi and other rivers flowing into Lake Bolon have poorly drained soils with an excessive moisture content. Fluctuations of erosion baselevels and the hydraulic regime of the lake are important factors forming the ecosystem of Selgon-Kharpi peatlands that are a key element of the site alongside Lake Bolon (Тягунин, Никитина 2006).

The Kharpi and Simmi rivers have pronounced deltas. The former one is broad, consisting of several branches; the latter one is shaped as a system of impoundment lakes, two of these being large: Kiltasi (1360 ha) and Albite (7180 ha). In total, the catchments in middle and lower reaches of the Kharpi and Simmi rivers comprise 610 and 744 lakes (over 1 ha), respectively, covering an area of about 5,320 ha (Resursy 1966). Hydrological regimes of the Simmi, Selgon, and Kharpi are determined by rain feeding, which is typical of Far Eastern rivers. Summer runoff makes over 90% of the annual flow, therefore the rivers are shallow in winter and freeze considerably. Spring floods are usually low-grade; they are followed by a summer low-water period. Minimal water levels are reached in end June or early July. Many floodplain lakes dry out or become extremely shallow during this period. Since over 50% of the annual precipitation fall usually in the second half of the summer, water levels in rivers rise and reach their maximum in end August or beginning September. Normally, a few floods take place during summer. This water regime creates specific ecological conditions for floodplain inhabitants. Since the summer floods coincide with the final stage of vegetation development and rearing of the young, high water levels put destructive impact on the fauna. However, the severity of their destructive or favorable impact depends on the occurrence time, duration, and water level rise. Due to the low water level in winter, most fish species migrate from the rivers in autumn and return there in spring. The variable hydrological regime determines a high migration activity of animals and, generally, creates an adaptive background (Кадастровые сведения...2007).

18. Hydrological values:

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

The site mainly supports groundwater level and accumulation of sediments. Hydrological values of the site require further study.

19. Wetland Types

a) presence:

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

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

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

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

b) dominance:

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

- 1) Permanent freshwater marshes on inorganic soils – Tp;
- 2) Permanent inland deltas – L;
- 3) Permanent freshwater lakes – O;
- 4) Permanent rivers/streams/creeks – M;
- 5) Seasonal freshwater marshes on inorganic soils – Ts;
- 6) Permanent freshwater shrub-dominated swamps on inorganic soils – Tp;
- 7) Permanent non-forested peatlands – U;
- 8) Permanent forested peatlands – Xp.

20. General ecological features:

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

The site comprises Lake Bolon, which is one of the largest inland lakes of the Middle Amur Plain, shallow delta lakes, meandering river courses, branches, and floodplain lakes. Their lowland shores covered with meadow and mire vegetation and expansive peatlands provide habitats to wetland birds (Сапаев, Росляков 2005). Dynamics of ecosystem status are determined by a specific hydrological regime. Most primary peatlands in the upper and middle courses of the rivers in the Bolon catchment underwent a floodplain stage of their development; floodwater and groundwater compositions that determine mineral feeding of phytocenoses affect successions of forbs, aquatic, meadow, peatland, and forest biogeocenoses. Paludified meadows and mires with forest islands form a typical landscape of the Middle Amur River. A considerable portion of the lake basin is covered with *mari* – a type of hypertrophic intrazonal mire communities that remind forest tundra in appearance.

Eutrophic marshes are widespread in the Simmi and Kharpi catchments. The vegetation cover is dominated by the following herbaceous plants: *Calamagrostis langsdorffii* and sedges (*Carex schmidtii*, *C. pseudocuraica* and *C. appendiculata*). The shrub story is ulterior; it is represented by groves of willows (*Salix brachypoda*), meadowsweet (*Spirea salicifolia*), and shrub birches (*Betula fruticosa*). Meadow and mire plant species are widespread locally: *Stellaria longifolia*, *Sanguisorba parviflora*, *Caltha membranacea*, *Lathyrus sp.*, *Galium sp.*, *Artemisia integrifolia*, *Lythrum salicaria*, and others. Mosses cover from 50 to 70% of the soil surface (Шлотгауэр 2002; Антонова 2006).

Grass and sphagnum mesotrophic peatlands form narrow bands around forested drained mires associated with permafrost mounds. The communities consist of the dwarf shrub and grass story and the moss story. Nearly all the mire surface is overgrown with sphagna mosses that reach 80 to 95% of the projective cover. Shrubs and herbs are relatively rare and do not form a closed story, with *Carex limosa*, *Iris laevigata*, *Menyanthes trifoliata*, and *Pedicularis grandiflora* being the commonest ones. Vegetation of sphagna heterotrophic mires shows a complex character. It is determined by the diversity of micro-relief forms: sedge hummocks, sphagna cushions, and depressions between them. Hummocks are overgrown with sedges (*Carex minuta*, *C. uda*). Micro-depressions are occupied by eutrophic and mesotrophic sphagna mosses with a sparse dwarf shrub-and-forbs story of *Vaccinium* shrubs and herbs. Sphagna cushions are occupied by oligotrophic plants: *Sphagnum magellanicum*, *Chamaedaphne calyculata*, *Ledum palustre*, cranberries, *Vaccinium uliginosum*, etc. (Шлотгауэр 2002).

Meadow vegetation is represented by *Calamagrostis*, *Calamagrostis-Carex*, *Calamagrostis-forbs*, and, to a lesser degree, by forbs meadows. *Calamagrostis* meadows are monodominant and homotypic in species composition and story structure; they are confined to stretches of rapid and short-term inundation (Антонова, Малыгина 2005). They are usually separated from the river by willow groves or a fringe of hummock-forming sedges. As the water level rises, it spreads a layer of fertile mud over the meadows, which promotes the development of dense stands. Permanent, though rare companions of *Calamagrostis* are *Fimbripetalum radians*, *Lathyrus pilosus*, *Anemoidium dichotomum*, *Sanguisorba parviflora*, and *Lycopus lucidus*. Willow-leaved meadowsweet (*Spirea salicifolia*) forms pure thickets on elevated landforms among *Calamagrostis* meadows (Антонова 2004). Sedge meadows are typical for negative landforms of the floodplain relief with hydrogenic conditions. Hummock-forming sedges are typical there, while *Carex vesicata* forms small groups at sites with abundant, though continuously flowing watering. Forbs meadows are confined to skirts of *relka* forests and brushwood. They are small in area, but make a considerable contribution to the biodiversity of the site.

Forest vegetation is only found on *relka* ridges. The commonest forest associations are open ledum and sphagnum larch forests. Broadleaved forests, such as oak forests, are associated with *relka* ridges, while alder forests grow on river floodplains. More common are small-leaved tree species, including birches, aspens, and willows, as well as brushwood (Шлотгауэр 2002; Антонова 2004). The few forest massifs are the principal refuge of forest animal species in the area (Сапаев, Росляков 2005). The richest species diversity is observed on the shores of Lake Kiltasin in small fragments of broad-leaved forests of *Fraxinus mandshurica*, *Phellodendron amurense*, *Tilia amurensis*, and *Quercus mongolica*, with undergrowth of *Corylus mandshurica*, *Eleutherococcus senticosus*, and lianas *Vitis amurensis*, *Schisandra chinensis* (Антонова 2006).

The aquatic flora is mainly formed by Asiatic species. Over 66% of these species belong to the Nemoral floral complex and represent species diversity of Southeast Asian and Far Eastern elements. The diversity and abundance of plant species in various water bodies depend, on the one hand, on how they are adapted to water environment, and, on the other hand, on how water regimes of rivers and lakes change during vegetation period (Крюкова 2006). Vascular aquatic vegetation is only relatively diverse in floodplain lakes, where stands of *Trapa natans*, *Nymphoides peltata*, *Nuphar Smith*, and *Potamogeton natans* are predominant. It is extremely suppressed or absent in delta lakes and Lake Bolon due to their unfavorable water regimes. Numerous channels of the Kharpi river delta are fringed by stands of *Zizania latifolia*. This area provides the most favorable habitats for waterbirds. Many colonial birds nest on the shores of water bodies: about 150 pairs of the Grey Heron (*Ardea cinerea*), up to 200 pairs of Great Cormorant (*Phalacrocorax carbo*), up to 100 pairs of Common Tern (*Sterna hirundo*), and up to 200 pairs of Black-headed Gull (*Larus ridibundus*) (Сапаев, Росляков 2005). Riverside fringes of willow groves are of great importance, as they support breeding habitats of storks, raptors, and Passeriformes.

The benthic biomass in Lake Bolon is the greatest on sandy-muddy grounds (26.5 kg/ha) followed by muddy (24.1 kg/ha) and sandy portions (11.4 kg/ha). Gravelly-sandy grounds are the poorest in terms of benthos abundance (0.53 kg/ha). The benthos is mainly represented by *Chironomidae* (88% of the biomass), *Perlidae*, *Oligochaeta* (12% of the biomass on sandy-muddy grounds), and *Mollusca*. The plankton is predominated by microscopic algae that cause strong water bloom lasting till late autumn. Their numbers exceed those of all other groups of organisms. In total, 115 species of algae have been registered in the lake, with diatoms being the most numerous (65 species). Blue-green algae predominate in terms of abundance and biomass: *Aphanizomenon sp.*, *Anabaena sp.*, *Myrocystis sp.* and others. The commonest are *Melosira* of the diatoms, *Spirogyra* of the green algae, and *Ceratium* of the peridineans. The zooplankton is predominated by protozoa and rotifers (on average 36,315 specimen/m³ of water); less abundant are cladocerans (*Chydorus*, *Daphnia*, *Bosmina*) (Микулич 1948; Хахина 1948).

Lake Bolon and especially water bodies in river deltas are important spawning and feeding grounds of many fish species of the Amur that enter these in summer. Fluctuations of water levels in these water bodies cause an increased migration activity of fishes. A diverse fish species composition and considerable fish resources are most important for the survival of many wetland birds and raptors that inhabit the area (Сапаев, Росляков 2005). The site is a typical habitat of the Siberian weasel (*Mustela sibirica*), red fox (*Vulpes vulpes*), raccoon dog (*Nyctereutes procyonoides*), elk (*Alces alces*), Siberian roe deer (*Capreolus pygargus*), otter (*Lutra lutra*), and muskrat (*Ondatra zibethica*). The brown bear (*Ursus arctos*) is a common summer visitor; less common are the Siberian deer (*Cervus elaphus sibiricus*) and wild boar (*Sus scrofa*).

21. Noteworthy flora:

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

Currently, 342 species of vascular plants have been registered at the site (Шлотгауэр, Крюкова, Антонова 2001; Антонова, Малыгина 2005; Крюкова 2006). The area is noteworthy, as it supports some representatives of Manchurian flora, including hydrophytes, at the border of their distribution ranges. Rare relict species, such as *Dioscorea nipponica*, *Paeonia obovata*, *Iris ensata*, and *Trapa pseudoincisa*, have been observed here at the northeast border of their area. Identified in the Bolonsky State Nature *Zapovednik* is a disjunctive relict population of *Ottelia alismoides* that typically grows in South-East Asia, Northern Australia, and Egypt. The site supports 15 taxa of aquatic and shoreline plants that are endemic of the Amur region. Vegetation cover of the site is unique, as it supports relict families of *Nelumbonaceae*, *Trapellaceae*, *Cabombaceae*, *Eriocaulaceae* at the northern border of their distribution range – 38 taxa in total, which makes 11% of the freshwater flora in the Lower Amur catchment (Крюкова 2006).

Moreover, the site is also valuable as a habitat of medicinal plants. In fact, on territory of the Bolonsky State Nature *Zapovednik* alone, medicinal plants constitute 61% of the total vascular flora

of the reserve. Most of them belong to the following families: *Rosaceae* (16 species), *Asteraceae* (15), *Ranunculaceae* (9), *Scrophulariaceae* (6), *Betulaceae* (6), *Fabaceae* (6), *Ericaceae* (6), *Aspargaceae* (6), *Polygonaceae* (5), *Potamogetaceae* (5) (Мальхина 2006).

The synanthropic flora of the Bolonsky State Nature *Zapovednik* is represented by 11 plant species that are associated with *cordons* (field stations) only and do not participate in formation of vegetation communities in the reserve; however their impact on rare and protected plant species cannot be excluded (АНТОНОВА 1990, 2006).

22. Noteworthy fauna:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 12. Justification for the application of the Criteria) indicating, e.g., which species/communities are unique, rare, endangered or biogeographically important, etc., including count data. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

The site supports 18 species of bird listed in Red Books of the Russian Federation, IUCN, and Asia. Some rare waterbirds and wetlands birds require special care and protection. Experts have recorded an alarming trend of a considerable decrease in numbers of the Swan Goose (*Cygnopsis cygnoides*), Greylag Goose (*Anser anser*), Baer's Pochard (*Aythya baeri*), Chinese Merganser (*Mergus squamatus*), and Great Spotted Eagle (*Aquila clanga*). Numbers of the Lesser White-fronted Goose (*Anser erythropus*) and Eastern Curlew (*Numenius madagascariensis*) decreased by an order of magnitude. Populations of the Japanese Crane (*Grus japonensis*), Baikal Teal (*Anas formosa*), and Golden Eagle (*Aquila chrysaetos*) have stabilized with extremely low abundance indexes. These changes require further study. Population statuses of the Oriental White Stork (*Ciconia boyciana*), White-tailed Eagle (*Haliaeetus albicilla*), and Hooded Crane (*G. monacha*) are somewhat more favorable (АНТОНОВ 2004; НИКИТИНА 2004; НИКИТИНА и др. 2006). Endangered wader species with archaic range types, such as the Spotted Greenshank (*Tringa guttifer*) and Spoon-billed Sandpiper (*Eurynorhynchus pygmeus*), can be observed on territory of the reserve (АНТОНОВ и др. 2006). The site supports rare fishes, such as *Aristichthys nobilis*, *Megalobrama terminalis*, *Mylopharyngodon piceus*, and mammals, such as *Plecotus auritus*.

Valuable faunal species also include game species, such as the Siberian deer (*Cervus elaphus xanthopygus*), Siberian roe deer (*Capreolus pygargus*), raccoon dog (*Nyctereutes procyonoides*), brown bear (*Ursus arctos*) etc.

23. Social and cultural values:

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

Traditional nature management of indigenous peoples of the Amur region (the Nanais) and their traditional territory. Sport fishing, recreation, ecological and historical tourism.

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

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

- i) sites which provide a model of wetland wise use, demonstrating the application of traditional knowledge and methods of management and use that maintain the ecological character of the wetland:
- ii) sites which have exceptional cultural traditions or records of former civilizations that have influenced the ecological character of the wetland:
- iii) sites where the ecological character of the wetland depends on the interaction with local communities or indigenous peoples:

- iv) sites where relevant non-material values such as sacred sites are present and their existence is strongly linked with the maintenance of the ecological character of the wetland:

24. Land tenure/ownership:

- a) within the Ramsar site:

The territory of the Bolonsky State Nature Zapovednik is state owned. Areas included in the Ramsar site and surrounding to the Bolonsky State Nature Zapovednik belong to the state forest land.

- b) in the surrounding area:

25. Current land (including water) use:

- a) within the Ramsar site:

There is no commercial land use on territory of the Bolonsky State Nature Zapovednik.

- b) in the surroundings/catchment:

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

- a) within the Ramsar site:

Lake Bolon, especially near the mouth of the Kharpi River, and the Kharpi River are used by local people for fishing.

- b) in the surrounding area:

Negative factors of human origin are annual forest fires, poaching, pollution of the Amur water, and disturbance. Potential impact of hydro power stations on water regimes of rivers in the Amur catchment may become another negative factor.

27. Conservation measures taken:

In 1994, the site was designated as wetland of international importance (Ramsar). The statute and borders of the internationally important wetland "Bolon" were adopted by the Head of the Khabarovsk Krai Administration (Decree no.6 on January 4, 1996).

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

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

Currently, a part of the wetland's area (about 35,000 ha) is occupied by the Bolonsky State Nature *Zapovednik* that was established in 1997 (103,600 ha, IUCN category: Ia).

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

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

- c) Does an officially approved management plan exist; and is it being implemented?: No.

- d) Describe any other current management practices:

In 1996 the Ramsar site was established in the borders of the Simminsky State Nature *Zakaznik* that was then abrogated after the establishment of the Bolonsky State Nature *Zapovednik*. However, only about 2/3 of the abrogated *zakaznik* were included in the newly established *zapovednik*. Therefore, more accurate definition of the borders of the Ramsar wetland is reasonable in the future.

28. Conservation measures proposed but not yet implemented:

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

It would be advisable to consider more accurate determination of the boundaries of the Ramsar wetland and to consider possibility to increase area of the Bolonsky State Nature *Zapovednik* near Lake Bolon.

To consider development and implementation of a programme for community involvement in ecological and tourist activities.

It would be advisable to carry monitoring works on waterbirds and wetland birds, also, to count birds during migration periods; and to study probable impacts of building hydrotechnical constructions on the wetland.

29. Current scientific research and facilities:

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

Prior to the establishment of the Bolonsky State Nature *Zapovednik*, the site was studied by experts of various research institutions from Moscow and Khabarovsk; their reports represented base for monitoring works that have been carried out by the staff of the Bolonsky State Nature *Zapovednik*. In addition to standard monitoring studies, the Bolonsky State Nature *Zapovednik* runs monitoring works for health of rare birds and their environment; populations of cranes, Oriental Stork, White-tailed Eagle, and other rare birds.

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

e.g. visitors' centre, observation hides and nature trails, information booklets, facilities for school visits, etc.

Published media, local radio and TV have been encouraged to inform public at large. Every quarter, the provincial newspaper "Pacific Star" issues its annex "Eco Echo" where it gives an insight into problems of ecological safety and statuses of the forest, water, and geological funds. All-Russia contests of librarian projects on environmental education of Khabarovsk Krai communities have been held, as well as the provincial contest "Let's protect Far Eastern forests from fire" (Государственный доклад...2001). After the establishment of the Bolonsky State Nature *Zapovednik*, its staff has carried out most work on environmental education of the local people.

31. Current recreation and tourism:

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

Ecological tourism with participation of Russian and international tourists is not developed but occurs occasionally. There are a few ecological routes in the Bolonsky State Nature *Zapovednik* (Черныш, Тягунин 2006). A community involvement programme in ecological-tourist activities was developed, but not yet implemented for financial reasons.

32. Jurisdiction:

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

Government of the Khabarovsk Krai, Ministry of Natural Resources and Environment of the Russian Federation

33. Management authority:

Provide the name and address of the local office(s) of the agency(ies) or organisation(s) directly responsible for managing the wetland. Wherever possible provide also the title and/or name of the person or persons in this office with responsibility for the wetland.

Within the Bolonsky State Nature *Zapovednik* : FGU "The Bolonsky State Nature *Zapovednik* ", head is Vitaly Alexandrovich Tyagunin. Beyond the borders of the Bolonsky State Nature *Zapovednik*: Government of the Khabarovsk Krai, local authorities.

34. Bibliographical references:

Scientific/technical references only. If biogeographic regionalisation scheme applied (see 15 above), list full reference citation for the scheme.

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