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Protected Microhabitats as a part of Baikal Regional Ecological Network.

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Introduction.

As it is well known, the best way to conserve most plants and animals is to protect their habitats in areas where they are living. This protected areas should not be seen and managed in isolation, but as part of vast web of interconnections. In this web the diversity in the size of protected areas is also found own importance. Because of all this circumstances , the actual creation of Ecological Network of Baikal Region (as a model region for this process in Central Asia) is based on the principles of united using of various-range set of protected areas as a part of common correlated network. In this set of network's elements the small protected areas - protected microhabitats - are mentioned as one of most important sections. Attention to microhabitats in Baikal EcoNetwork projecting is very actual now because of prevailing of a large protected areas in whole Central Asia now, which did not can permit a full decision of all problems with species conservation. Protection of microhabitats here will help implement in Central Asia the methodology and approaches , which are now good developed in Pan-European Ecological Network creation process and in European Plant Conservation Strategy, including especially such important basic parts of European conservational process, as Natura 2000, Emerald Network, EU Habitats Directive and Important Plant Areas Programme.

Material and Methods.

The creation of protected microhabitats network as a part of Baikal Regional EcoNetwork have beginning near 1995, but became more active in 1998 , when the Regional Development Plan was accepted, where one of the focuses became a many-functional protected areas system implementation. At the beginning of the process the microhabitats were mentioned only as plant microreserves, but after 1998 there was an activization of including of important animal habitats to this network.

Protected microhabitat, or natural microreserve, of Baikal region is now defined as a small protected territory in near 10 –20 ha, which is important representative habitat of one or more endemic, rare, relict or endangered species of plants and animals, and for which needed legal protected acts were accepted on local or regional level. All protected microhabitats are mentioned as parts of entirely connected network with structural and functional unity and complementation.

This microreserves network is, in own turn, a system element of whole regional EcoNetwork of protected areas with various accepted ranges and sizes (core areas, corridors, buffer zones , etc.) . Predominantly objects for microreserves establishing are habitats, which according to their type can not usually be in a large size, but which are in Baikal region a most important types of habitats for main quantity of endemics, relicts and rare plant and animal species. Such types here are rocky hills, mountain peaks, coast cliffs, sandy coastal dunes, salt lakes coasts, thermal river streams, and some other. Besides of that, the microreserves are created on some parts of typical regional landscapes, where the habitat conditions for existing of especially important species are situated. Baikal microreserves belongs to 3 and 4 IUCN Conservational Categories, and they are created both independently, and in the frameworks of territories of more large protected areas, such as, for example, 2 Category Pribaikalsky National Park, where many habitats requires more strong especial protected regimes on western coast of Baikal.

Results and Discussion.

Baikal region has a large diversity of habitats which are merit a status of microreserves with floristic, faunistic or syntaxonomic criteria. Because of this, planning of their establishment is divided in few parts. Now the first stage of the process is completed . It includes a creation of natural microreserves directly on Baikal coastline, islands and neighboring mountain ranges (area, which is the World Heritage Site since 1996). This first stage is developed according to conservational importance of plant and animal species. This is firstly endemics of western coastline of Baikal (21 species of high plants and 1 species of mammal animals), endemics of all Baikal coastline (35 high plant species and 1 mammal animal), endemics of Baikal –Sayan Mountain Area – 55 species of high plants and 2 vertebrate animals. Many of this plant species are also floristic relicts of tertiary and quarternary periods .

The second stage of microreserves will cover habitats of species with one or more borders of areal in Baikal region – near 130 species of high plants and more than 30 species of vertebrate animals , and also of other endangered species with small or far disjunctive populations – more than 60 high plant and 25 vertebrate animal species, some of which are covered already in the first stage in connection with especial importance. Many of them are also floristic and faunistic relicts.

There are also many unique microhabitats of invertebrates in Baikal region, which are in plan of special third stage of microreserves creation.

Some of the more interest examples of species , which are now protected in completed first stage of natural microreserves, are follows.

Plants.

Hedysarum zundukii – strict endemic of steppes and rocky coastal cliffs near Zunduk cape on the middle part of western coast of Baikal. Remains from ancient Mediterranean flora of miocene-pliocene , has most closely relations with

modern Caucasian species of *Hedysarum* (such as *Hedysarum elegans*).

Hedysarum cisbaicalense – strict endemic of high mountain tundras, rocks, stone floods (kurums) alpine peaks of the central part of western Baikal coastline. Remains from holocene arctic-alpine flora.

Oxytropis triphilla, *O. popoviana*, *O. peschkoviae* - strict endemics of dry cold mountain steppes of the slopes of western Baikal coastline and Baikal islands of Olkhon group (Olkhon itself and 14 small islands). Remains from miocene – pliocene ancient mediterranean steppe flora without modern closely relations.

Oxytropis microphylla – strict endemic of salt lakes coasts in the steppes on the western part of Baikal coastline. Isolated representative of central-asian halophytic flora.

Oxytropis tragacanthoides – far isolated population of typical central-asian species of Altay-Dzhungarian and Mongolian dry mountain steppes, remains in some points of western coast of Baikal from the most warm and dry period of Tertiary.

Astragalus olchonensis – strict endemic of sandy coastal dunes of Olkhon island, predominantly with habitats of first successional stage of dunes vegetation forming (together with *Oxytropis lanata*).

Craniospermum subvillosum – endemic of whole Baikal coastline with isolated habitats only on sandy and gravel beach coastal belts.

Viola incisa - far isolated population, only one in whole Baikal region, other 5 existing populations of this species are also isolated points in Altay mountains. Relict of pre-glacial late-tertiary flora.

Physochlaina physaloides – relict of one of most ancient periods of Baikalian flora formation – paleogene dry hot deserts. Remains in isolated extreme northern habitats, indicating the border of northern distribution of this paleogene deserts in Asia.

Deschampsia turczaninovii – strict endemic of sandy and gravel beaches of northern Baikal coastline.

Krylovia eremophila - extreme north isolated habitat on Zunduk cape of this central-asian endemic with other habitat only in small area of South Touva desert Remain from

miocene ancient mediterranean desert flora.

Animals.

- Alticola olchonensis* – the sole mammal (and at whole vertebrate) endemic of Baikal coasts, and especially – of Baikal western coastline and Olkhon Island. Living in rocky hills of dry steppes .
- Bufo raddei* - relict amphibian with isolated habitats on northern border of areal. Living in river deltas, salt lakes, coastal small water fragments.
- Elaphe dione* – relict central-asian reptile with northern border of areal in Near-Olkhon and Olkhon itself coasts. Living in steppe rocky hill in valleys of small rivers and streams near their mouths.
- Tadorna ferruginea* – relict bird of central-asian steppe landscapes. Living on salt lakes and rocky coastal cliffs of Baikal coasts.
- Calidris subminuta* – northern tundras relict bird on the south border of areal. Living on wetland of Sarma river delta.
- Perdix dauuricae* - central-asian steppes relict bird on northern areal border. Living in meadow high-grassland coastal steppes.
- Eremophila alpestris* – central-asian steppes relict bird on northern border, living in stony dry steppe hills.
- Falco cherrug* - eurasian bird of prey with eastern and northern borders of areal near northern coast of Baikal. Living on wide steppes of mountain slopes. Including to Russian National Red Book.
- Aquila heliaca* - eurasian famous bird of prey with northern and eastern borders of areal . Symbolic sacred bird of local Buryat people – most their spirituous symbols. Living on forest-steppe parts of Olkhon and Near-Olkhon coasts . Including to IUCN Red Book.

For species, which are protected in microreserves, the special conservational measures are now implemented and will be further improved. More common measures are now regulation of extremal impacts, norming of pastoral pressure, prevention of habitats destroying , establishing of optimal nature using possibilities, permanent monitoring of the structural and functional parameters of the populational dynamics. For some of the species there are made a special efforts for their status restoring in microreserves. It may be full or partially seed reintroduction of population, steppe plant cover rehabilitation after the disturbance of habitat, seeds banking for the protected species, making of artificial nests for birds and nesting places for amphibians and reptiles, detailed migrational peculiarities of birds evaluation, and so on active conservational efforts.

Conclusion

At whole, first years of experience of microhabitats conservation in Baikal region gives an opportunity to believe, that it is one of progressive form of nature conservation here, and it must be further developed in possible ways as a part of development of general Baikal Regional Ecological Network - one of representative models of such networks for Central Asia.