The Ramsar Convention on Wetlands

Ramsar site management plans -- Russian Federation, Karaginsky Island (file 1 of 6)

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K A R A G I N S K Y I S L A N D

"KARAGINSKY ISLAND" RAMSAR SITE

Geographical location:

Karaginsky Island is in the western part of the Bering Sea, at the northeastern coast of Kamchatka peninsula (the Koryak Autonomous Area, Karaginsky rayon). The distance from the rayon centre (Ossora village) is 55 km (Fig. 1, 4).

Geographical coordinates: 58° 28' – 59° 16' N; 163° 24' – 164° 22' E.

Wetland area: 193,597 hectares

Altitude: 0 - 434 m above sea level

Wetland types:
According to the Ramsar classification – A, D, F, G, E, M, O
According to the Russian classification – 1.1.1.1., 1.3.1.0., 3.8.1.3, 2.5.1.3, 2.5.2.0

Criteria for including into the list: 1a, 2a, 3a. The major criterion (3a) is an area of mass waterfowl aggregations.

Brief characteristics: Karaginsky Island with 2-km coastal zone is of great importance for conserving migratory birds and their habitats. The river mouth is an area of moulting of waterfowl; rocky terrains are grounds for bird colonies.

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1. INFORMATION OF THE ENVIRONMENTAL STATUS

1.1. PHYSICAL

CLIMATE

Winter (from setting the snow cover to snow melting) lasts about 7 months. About three fourth of precipitation falls as snow. The mean February air temperature is - 11° C only on the island, usually it is lower. The absolute minimum is - 18.9° C. In some years, snowstorms are frequent in winter (39 - 42 snowstorm days, sometimes, > 90 days). Snow melts at the period from May 15 to June 7, in some years much later. Even in July some stream valleys are packed with snow to a depth of 5 m. Large snow

blankets are kept on mountain slopes to the new snow.

In summer mists are frequent on the eastern side of the island. The mean June and July temperatures are +11.7° C and +11.8° C, respectively. The day temperature seldom exceeds +14° C. Frost-free period is 101 days (Reference book on climate of the USSR, 1970. 27, I, III, V parts).

TOPOGRAPHY AND HYDROGRAPHY

Karaginsky Island is located in the western part of the Bering Sea, at the northeastern coast of Kamchatka peninsula. The Straight of Litke of 40-50 km wide separates the island from the peninsula. The length of the island from Golenishchev cape on the north to Krasheninnikov cape on the south is 111 km, its greatest width is 45 km, and area is 2,000 sq.km.

The island is divided into 2 almost equal parts, which are very different in topography: western and eastern. The first is a plain of marine origin and consists of several sea terraces. This plain is dissected by rivers and represents flattop hills, the elevation of which is not more than 100 m above sea level. The shoreline of northwestern and western coasts of the island is smooth; there are no large gulfs, except the Bay of Lozhnykh vestei that is formed by Lekalo bar. The mountain part of the island is composed of three ridges. The largest Central ridge extends from north to south as a narrow (3-6 km) monolithic one of 30 km long. The highest mountain of the island is Vysokaya (912 m). The eastern and southeastern coasts have indented shoreline with a number of small bays and gulfs. The only large Severnaya Bay permits sea crafts to approach the island from its eastern side. The rest 120 km of the coast, which is abundant in cliffs and reefs, do not allow sea boats to land.

The branched river network of Karaginsky Island includes 1,105 rivers and streams. A rather high water level in the rivers is kept for the whole summer. Alimentation of rivers is provided mostly by atmospheric precipitation. However, there are some springs in the plain of the island. The largest river of the island is the Maminkvayam with the catchment basin of 100 sq. km. The right long and branched tributaries of the Maminkvayam flow mostly over the plain. In the upper reaches they are of mountain type: shallow with fast current, many rapids and rifts. They run in narrow and rocky valleys. When the rivers run on the plain, their flow becomes lower, and they form branches, islands, and shallows. In summer in the middle Maminkvayam reaches, the depth is 1-1.2 m,;in the lower reaches, the depth is about 1.5 m (Yudin, Grinchenko, 1952).

The second large river of the island, the Gnunvayam, is of 22 km long with a catchment basin area of 80-85 sq. km. It flows through the elevated plain and has a valley with bluffs. Only in the mouth before falling into the Litke Straight the river current is slowed down. The mean river depth here is 1.2-1.5 m, in some places, 3 m.

The third river falling into the Litke Straight is the Markelovskaya River of 17 km long. The catchment basin area is 100 sq. km. The river rises in the eastern mountain ridge, runs over depression between ridges, and at the mouth it may be referred to the type of plain rivers.

The rest island rivers are smaller than those mentioned above in length and catchment basin area. They are mountain rivers with rapids and rifts. In summer, when snow melts in the mountains, the water level rises in daytime, at nights it is lowered. In the lower reaches the rivers have different depths depending on high and low tides. Besides, many streams and rills dissect the coast of Karaginsky Island.

Sea bars at mouths of the Maminkvayam and Markelovskaya Rivers form vast shallow lagoons, the water level of which ranges: in high tide they are full-flowing, in low water shallow. Sometimes the Markelovskaya River lagoon is entirely drained.

The El’navan River lagoon of 15-20 km long extending inland Yuzhnyi peninsula is connected with the sea only during high tides. Its water is fresh, the water level ranges moderately. In reality, this lagoon is a lake.

Hundreds of lakes occupy 0.5% of the Karaginsky Island area. Couples with River branches and coastal water pools, lakes and wetlands are of exclusive value for waterfowl reproduction.

1.2. ECOLOGICAL

FLORA

According to the geobotanic zoning, Karaginsky Island belongs to the Beringian forest-tundra region (Kolesnikov, 1961). In the authors' opinion, that have given a more complete floristic review of the island vegetation (Barkalov et al., 1986), this territory should be referred to the North-Pacific meadow-deciduous forest region due to the presence of *Betula ermanii* forests and tall grass vegetation on the flat interfluve.

FLORISTIC CHARACTERISTIC

The major source that describes the island flora is a publication of V.Yu.Barkalov et al. (1986). This work describes 490 vascular plant species (according to the present ideas, their number is smaller since the authors differently consider the species volume). Table 1 shows the species composition of large families of the island flora.

Table 1: Species composition of large plant families in the flora of Karaginsky Island

No.	Family	Number of species in the flora	Position by species number
1	Poaceae	61	1
2	Cyperaceae	33	2-3
3	Asteraceae	33	2-3
4	Rosaceae	28	4
5	Ranunculaceae	18	5
6	Salicaceae	13	6
7	Ericaceae	11	7-8
8	Brassicaceae	11	7-8
9	Scrophulariaceae	9	9-13
10	Caryophyllaceae	9	9-13
11	Polygonaceae	9	9-13
12	Apiaceae	9	9-13
13	Juncaceae	9	9-13

CHECKLIST OF VASCULAR PLANTS WITHIN THE KARAGINSKY ISLAND WETLAND

1.2.1. INVENTORY OF HABITATS

CLASSIFICATION AND CHARACTERISTIC OF HABITATS

GENERAL CHARACTERISTIC OF VEGETATION

The territory of Karaginsky Island was never considered as reindeer pastures (domestic reindeer was

brought here not so long ago), therefore, there is no information regarding them. (The major sources of the information about vegetation of the KAO are materials of the Angara expedition). The main information of the island vegetation is given in publications of A.S.Plotnikov, N.V.Trulevich (1974), and V.Yu.Barkalov et al. (1986).

Betula ermanii forests of park type grow mostly on sea terraces and foothills of the western part of the island, from Pereval Mountain to Vysokaya Mountain over a space of 50 km. They occupy elevations from 20 to 280 m above sea level, their area is about 1% of the total territory. The major plant formations composing landscapes of the island are dwarf shrub hummock tundra (the most widespread tundra are dwarf shrub- lichen, short grass meadow, heather, and crowberry that cover about half of the area) and Siberian dwarf-pine and alder elfin woods. The Siberian dwarf-pine (Pinus pumila) predominates, forming thickets on more drained terrain, especially in middle and upper parts of the subalpine belt, to an elevation of 700 m above sea level. Dense alder (Alnus fruticosa) thickets (shrubby alder and elfin woods) occupy predominantly narrow creek valleys of the northern part of the island. They also occur in the lower portion of the subalpine belt. In the alpine belt (more than 700 m above sea level) mountain tundra predominates. Just this belt is characterised by mosaic and complex plant communities with diverse species composition due to contrast conditions and diverse topography. Here, there occur patches of sedge-cotton grass hummock tundra vegetation with Eriophorum vaginatum and Carex lugens as dominants and sphagnum bogs with Andromeda polifolia and Saxifraga hirculus. On patches formed due to snow thawing, scarce nival groups composed of alpine and arctoalpine forbs (Juncus beringensis, Primula cuneifolia, Anemone sibirica, veronica grandiflora, Lloydia serotina, and oth.) are common. On drained substrate at snow patches and stream banks, the nival small meadows occur with dominance of Carex koraginensis, C. micropoda, C. eleusinoides, Trisetum spicatum, Pedicularis oederi, Valeriana capitata, Artemisia tilesii, and oth. Scarce petrophytic groups composed of Papaver microcarpum, Thalspi kamtschaticum, Emania parryodes, Dianthus repens, Astragalus alpinus are present on friable gravel substrates on hill slopes in the subalpine and alpine belts and on cliffs are grown with.

Communities of coastal halophytes are characteristic of the sandy and gravel seashore. On slopes of marine terraces and in inland areas, the forb and grass-forb meadows prevail. At the large river mouths one can meet wattens (mud flats) – saline meadows regularly flooding during high tides. On flat terrain of marine terraces, flat wet watersheds, and gentle slopes of river valleys, sedge and sphagnum bogs are common, in some places lakes are abundant. Thickets of *Salix alaxensis, S. pulchra, S. lanata, and S. fuscescens* occupy river valleys and depressions on flat coasts.

DOMINANT PLANT COMMUNITIES

Betula ermanii forests. Betula ermanii forests of park type (stocking 0.3-0.4) are typical for eastern Kamchatka. The undergrowth consists of Sorbus sambucifolia and Pinus pumila. In the grass cover Calamagrostis langsdorffii prevails, common plants are Maianthemum dilatum, Veratrum oxysepalum, Iris setosa, and Athyrium filix-femina, and oth.

Shrub and dwarf shrub tundra. Flat areas of marine terraces are covered with tundra communities dominated by Pinus pumila and Alnus fruiticosa and some other shrubs as an admixture. Heather tundra with domination of Empetrum nigrum, Phyllodoce caerulea, Rhododendron aureum and others are confined to drained elevations of watersheds.

Elfin woods. Alder elfin woods (wood-reed - fern with Calamagrostis purpurea and Dryopteris expansa) are typical for the site. The data regarding Siberian dwarf-pine elfin woods is absent.

Mountain tundra. Grass-dwarf shrub-lichen tundra prevails in the mountains. Their dominants are heather and Cladonia lichens. In saddles, weakly drained slopes and stream banks, moss-dwarf shrub-grass tundra develops with green moss and sphagnum as well as with willows (Salix arctica, S. sphenophylla, S. reticulata) and sedges (Carex fuscidula, C. rotundata, C. lugens, C. rariflora, and oth.). Bald mountain slopes remain without snow in winter because it is blown off. Heather tundra occupies these areas, whereas the sites well snow-protected are occupied by short-grass meadow tundra with diverse species composition without distinct dominants.

Sandy and gravel coasts, dunes. The coastal 10-15-m breaker zone is unvegetated. The next from the sea is a belt of scattered supralittoral halophytic vegetation represented by Senecio preudoarnica, Honckenya oblongifolia, Mertensia maritima, and Lathyrus japonicus with a projective coverage about 15%. The sandy coastal swells are covered with lyme-grass meadows composed of only Leymus mollis (projective coverage 30%) or with the admixture of the halophytes mentioned above and forbs (Ligusticum scoticum, Geranium erianthum, Chamerion angustifolium, Chamaepericlymenum, and oth.).

Mud flats (wattens). In the silt areas, at mouths of large rivers regularly flooding during high tide, the meadows with dominance of tussock Carex are widespread. Among other species are Puccinellia phryganodes, Carex cryptocarpa, and others. On the bottom of dry lagoons and in depressions, some patches of Agrostis clavata occur. On the loamy soils, which are saline due to seawater, Atriplex gmelinii, Cochlearia officinalis, and Potentilla stolonifera are common.

Bogs. Grass-dwarf shrub-moss bogs occupy river floodplains, lowlands of the seacoast, and wet territories of watersheds. In many cases, Salix fuscescens is the dominant (projective coverage 80%). Typical plants are Betula exilis, Andromeda polifolia, Ledum decumbens, Oxycoccus palustris, O. microcarpus, and Vaccinium uliginosum (25%).

Among sedges, Carex appendiculata, C. cryptocarpa, C. cinerea, C. rariflora (10-15%) predominate. Parnassia palustris, Comarum palustre, Equsetum palustre, Iris setosa, Rubus arcticus, Pedicularis labradorica, Polemonium campanulatum, Trientalis europaea s.l., Galium trifidum, and others (projective coverage 3-8 %) represent bog forbs. Sphagnum bogs develop on smaller areas and occur mostly on watersheds in the central part of the island. Their dominant is sphagnum moss; among fobs are Rubus chamaemorus, Drosera rotundifolia, Carex globularis, C. gynocrates, Pinquicula villosa, and others.

Boggy tundra occupies relatively small areas on the island in lower parts of river valley slopes or in the mountains or wet watersheds. Hummocks are characteristic of the valley microrelief. They can reach a height of 60 cm and diameter of 1 m. Vaccinium uliginosum (projective coverage 60 %); Empetrum nigrum s.l. (30 %), Betula exilis, Lonicera caerulea, Loiseleuria procumbens, Ledum decumbens, and Spiraea beauverdiana are abundant on hummocks. The space between hummocks is grown with grasses and forb (Calamagrostis purpurea, Chamerion angustifolium, Carex globularis, and oth. In the mountains sedge tundras with Carex lugens, Eriophorum vaginatum, and E. polystachyon predominate.

Wet meadows occur in the lower parts of slopes and in depressions of river valleys. Forb-grass meadows are dominated by sedges (Carex cryptocarpa, C. diastena, C. stans, and others). Cardamine pratensis, Calamagrostis purpurea s.l., Arctophila fulva, Cicuta virosa, and Angelica genuflexa are also representatives of the meadow grass cover. In wet meadows willow thickets are common (Salix pulchra, S. lanata, S. fuscescens, and S. chamissonis). In well-drained sites wood-reed and wood-reed-forb meadows develop with the dominant Calamagrostis purpurea s.l. Among other plants are Cirsium kamtschaticum, Cacalia hastata, Veratrum oxysepalum, Chamerion angustifolium, and Delphinium brachycentrum.

Lakes. Aquatic vegetation is mainly represented by Potamogeton natans, Sparganium hyperboreum, Hippuris vulgaris, Menyantha trifoliata, Isoëtes asiatica, Utricularia intermedia, and Callitriche palustris.

Rivers and streams. The aquatic vegetation is poor in species composition and represented by thickets of Batrachium eradicatum. Rivers and stream banks are overgrown with thickets composed of moisture-loving species (Senecio palustris, Chamerion latifolium, Angelica genuflexa, Anthriscus sylvestris, Ranunculus repens, Caltha arctica, and others. Muddy river shallows are covered with Limosella aquatica, Alopecurus aequalis, Equisetum arvense, Equisetum arvense, and others.

HABITAT MAP

Habitats map reflects the accepted classification and habitats location (Fig.5).

Habitat types of "Karaginsky island " Ramsar site.

No.	Habitat tipes	Area, sq. km
1	Siberian dwarf-pine elfin wood	793.26
2	*Betula ermanii* forests	46.2
3	*Betula ermani* open woodland	42.69
4	Grass tundra	295.55
5	Lichen tundra	431.91
6	Shrub tundra	273.99
7	Includes bogs	41.28
8	Golets (bald rocks)	3.02
9	Marine water area	1200
	Total	3127.9

1.2.2. FAUNA AND VERTEBRATE ANIMALS OF "KARAGINSKY ISLAND" RAMSAR SITE

TAXONOMIC CHARACTERISTIC AND CHECKLIST OF VERTEBRATES

The main checklist of vertebrates in the Ramsar wetland "Karaginsky Island" includes 305 species (119 birds, 13 mammals, and 173 fishes). Table 2.

BIRDS

BIRD POPULATION IN BREEDING PERIOD

Nesting period. Eighty species of nesting birds (without birds of prey and owls) were found on the island. Thirty-five species nest in floodplain forests. Twenty-two species inhabit various open woodless areas, 23 species dwell Siberian dwarf-pine elfin woods. Sixteen species nest in Betula ermanii forests. The maximum density (374.1 pairs/sq. km) of bird population is registered in the floodplain forests. In Siberian dwarf-pine elfin woods this parameter is 116.6 pairs/sq. km, open woodless areas, 97.8; in Betula ermanii forests, 94.4 pairs/sq. km.

The most abundant species in the floodplain are Arctic Warbler, Yellow Wagtail, and Red-throated Pipit. In Betula ermanii forests Rustic Bunting, Pine Grosbeak, and Arctic Warbler predominate. In Siberian dwarf-pine elfin woods, Yellow Wagtail, Red-throated Pipit, and Middendorff's Grasshopper Warbler prevail. In open woodless areas, Lapland Longspur (Lapland Bunting), Red-throated Pipit, and Yellow Wagtail are dominants.

The island is of great importance as an area for nesting > 400,000 sea colonial birds including Black-legged Kittiwake (120,000 pairs), Thick-billed Murre (Brunnich's Guillemot) and Common Murre (Gullemot) (60,000 pairs), Pelagic Cormorant (Pelagic Shag) (10,000 pairs), Pigeot Guillemot (8,000 pairs), Tufted Puffin (2,500 pairs), and Anseriformes (Gerasimov, 1970; 1977a; 1979b; 1986; Vyatkin et al, 1975; Vyatkin, 1986; Gerasimov and Vyatkin, 1972; Gerasimov 1979). These species are the most abundant among nesting birds in the territory of the Ramsar wetland. The next in abundance are passerines: Dusky Thrush (~ 60,000) and Red-throated Pipit (~ 50,000) (Table 3).

In various habitats the percentage of bird groups is different. In Betula ermanii forests, passerines account for about 99% of the total number of birds; in tundra and Siberian dwarf-pine elfin woods, 88%; in floodplains, 75% (Table 4,5). Ducks are more abundant in the floodplain (13% of the total number of

nesting birds); in tundra their number decreases to 6%, in Siberian dwarf-pine elfin woods, to 3%. The number of gallinaceous birds is maximum in elfin woods (9%); that of gulls, in floodplain (7%), and of auks, in tundra and floodplain (3%).

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For further information about the Ramsar Convention on Wetlands, please contact the **Ramsar Convention Bureau**, Rue Mauverney 28, CH-1196 Gland, Switzerland (tel +41 22 999 0170, fax +41 22 999 0169, e-mail ramsar@ramsar.org). Posted on this Web site, 13 May 2001, Dwight Peck, Ramsar.

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Ramsar site management plans -- Russian Federation, Karaginsky Island

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K A R A G I N S K Y I S L A N D

"KARAGINSKY ISLAND" RAMSAR SITE

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Table 2: Abundance of birds in the "Karaginsky Island" Ramsar site at the nesting period

	Population density (pairs/sq.km) and total number (individuals) of some species in various habitats									
Species	Floodplain forest		Betula ermanii forest		Siberian dwarf-pine elfin woods		Tundra and bogs (open woodless areas)		Bank scarps	
	Population density	Number	Population density	Number	Population density	Number	Population density	Number	Population density	Number
1	2	3	4	5	6	7	8	9	10	11
Red-throated Loon (Red-throated Diver) *G. stellata*	0.3	600	-	-	-	-	-	-	-	-
Arctic Loon *G. arctica*	0,01	20	-	-	-	-	-	-	-	-
Red-necked Grebe *P. grisegena*	0,02	40	-	-	-	-	-	-	-	-
Northern Fulmar *Fulmarus glacialis*	-	-	-	-	-	-	-	-	0,2	40
Pelagic Cormorant (Pelagic Shag) *Ph. pelagicus*	-	-	-	-	-	-	-	-	100	20000
Mallard *A. platyrhynchos*	0,1	200	-	-	2,5	200	-	-	-	-
Green-winged Teal *A. crecca*	2,0	4000	-	-	7,5	600	-	-	-	-
Eurasian Wigeon *A penelope*	0,1	200	-	-	2,5	200	-	-	-	-
Pintail *A. acuta*	1,6	3200	-	-	12,5	1000	-	-	-	-
Tufted duck *A. fuligula*	0,3	600	-	-	10,0	800	-	-	-	-
Greater Scout *A. marila*	0,2	400	-	-	2,5	200	-	-	-	-
Harlequin Duck *H. histrionicus*	-		3,1	5000	-		-	-	-	-
Oldsquaw *Clangula hyemalis*	0,01	20	-	-	-		-	-	-	-
Common Goldeneye *Bucephala clangula*	-		-	-	10	20	-	-	-	-

Common Eider *Somateria mollissima*	0,4	800	-	-	-		-	-	-	-
Black Scoter *Melanitta americana*	0,5	1000	-	-	-		-	-	-	-
White-winged Scoter M.deglandi	0,3	600	-	-	-		-	-	-	-
Red-breasted Merganser M. serrator	0,2	400	-	-	0,5	400	-	-	-	-
Table 2 continued										
1	2	3	4	5	6	7	8	9	10	11
Willow Ptarmigan L. lagopus	1,8	1800	6,0	9600	-	-	-	-	-	-
Rock Ptarmigan L. mutus	-	-	4,0	6400	5,0	400	-	-	-	-
Mongolian Plover Charadrius mongolus	-	-	0,1	200	-		-	-	-	-
Wood sandpiper *T. glareola*	0,5	500	-	-	2,5	200	-	-	-	-
Greenshank *T. nebularia*	-	-	-	-	2,5	200	-	-	-	-
Gray-tailed Tattler*Heter.brevipes*	-	-	-	-	2,0	160	-	-	-	-
Common Sandpiper *Actitis hypoleucos*	-	-	-	-	1,3	100	-	-	-	-
Terek Sandpiper *Xenus cinereus*	-	-	-	-	2,5	200	-	-	-	-
Northern (Red-necked) Phalarope *Ph.lobatus*	0,2	400	-	-			-	-	-	-
Long-toed Stint *C.subminuta*	1,0	1000	-	-	-	-	-	-	-	-
Dunlin *C. alpina*	1,0	1000	-	-	-	-	-	-	-	-
Common Snipe *G. gallinago*	-	-	-	-	2,5	200	-	-	-	-
Parasitic Jaeger (Arctic Skua) *S. parasiticus*	0,2	2000	-	-	-	-	-	-	-	-
Long-tailed Jaeger *S.longicaudus*	1,0	1000	-	-	-	-	-	-	-	-
Common Black-headed Gull *L. ridibundus*	0,02	40	-	-	-	-	-	-	-	-
Slaty-backed Gull *L schistisagus*	-	-	-	-	-	-	-	-	80	16000
Mew Gull *L. canus*	-	-	-	-	1,2	400	-	-	-	-
Black-legged Kittiwake *Rissa tridactyla*	-	-	-	-	-	-	-	-	1200	240000
Common Tern *S. hirundo*	0,05	100	-	-	1,5	100	-	-	-	-
Arctic Tern *S. paradisaea*	0,5	1000	-	-	12,5	1000	-	-	-	-
Aleutian Tern *S. aleutica*	0,01	200	-	-	10,0	800	-	-	-	-
Common Murre *Uria aalge*	-	-	-	-	-	-	-	-	600	120000
Thick-billed Murre (Brunnich's Gullemoth) *Uria lomvia*								-		
Pigeom Gullemot *Cepphus columba*	-	-	-	-	-	-	-	-	3	600
Table 2 continued										
1	2	3	4	5	6	7	8	9	10	11

Marbled Murrelet *Brach. marmoratus*	-	-	-	-	-	-	-	-	0,5	100
Kittlitz's Murrelet *Brach. brevirostris*	-	-	-	-	-	-	-	-	0,5	100
Ancient Murrelet *Synthliboramphus antiquus*	-	-	-	-	-	-	-	-	2	400
Crested Auklet *Aethia cristatella*	-	-	-	-	-	-	-	-	1,0	200
Least Auklet *Aethia pusilla*	-	-	-	-	-	-	-	-	0,5	100
Parakeet Auklet *Cyclorrhynchus psittacula*	-	-	-	-	-	-	-	-	1,0	200
Horned Puffin *Fratercula corniculata*	-	-	-	-	-	-	-	-	5,0	1000
Tufted Puffin *Lunda cirrhata*	-	-	-	-	-	-	-	-	25,0	5000
Common Cuckoo *C. canorus*	-	-	0,1	220	-	-	0,3	50	-	-
Oriental Cuckoo *C. saturatus*	-	-	-	-	-	-	0,2	40	-	-
Great Spotted Woodpecker *D. major*	-	-	-	-	-	-	0,4	70	-	-
Bank Swallow (Sand Martin) *Riparia riparia*	-	-	-	-	-	-	-	-	10,0	2000
Eurasian Skylark *A. arvensis*	4,0	4000	-	-	-	-	-	-	-	-
Indian (Olive) Tree Pipit *A. hodgsoni*	-	-	-	-	-	-	4,0	700	-	-
Pechora Pipit *A. gustavi*	4,0	4000	-	-	2,5	200	-	-	-	-
Red-throated Pipit *A. cervinus*	25,0	25000	13,0	20800	31,0	2500	-	-	-	-
Yellow Wigtail *M. flava*	24,0	24000	19,0	30400	54,0	4300	-	-	-	-
Gray Wagtail *Motacilla cinerea*	-	-	-	-	6,5	500	-	-	-	-
White (Pied) Wagtail *Motacilla alba*	1,0	1000	4,0	6400	4,5	400	-	-	-	-
Brown Shrike *L. cristatus*	-	-	0,5	800	-	-	2,0	300	-	-
Nutcracker *N. caryocatactes*	-	-	0,2	320	-	-	1,0	180	-	-
(Common, Northern) Raven *C. corax*		-	-	-	-	-	-	-	1,0	200
Table 2 continued										
1	2	3	4	5	6	7	8	9	10	11
Siberian Accentor *Prunella montanella*	-	-	0,1	160	-	-	-	-	-	-
Middendorff's Grasshopper Warbler *L.ochotensis*	-	-	13,0	20800	29,5	2400	2,0	300	-	-
Arctic Warbler *Ph. borealis*	-	-	11,0	17600	83,0	6600	9,0	1600	-	-
Dusky Warbler *Ph. fuscatus*	-	-	6,4	10200	11,0	900	-	-	-	-
Siberian Rubythroat *L.calliope*	-	-	8,0	12800	2,5	200	2,0	400	-	-
Bluethroat *L. svecica*	-	-	1,3	2000	12,0	1000	5,0	900	-	-
Dusky Thrush *Turdus eunomus*	-	-	5,0	80200	28,0	2400	7,5	1400	-	-

Willow Tit *P. montanus*	-	-	-	-	-	-	0,7	100	-	-
Oriental Greenfinch *Ch. sinica*	0,5	500	4,0	6400	1,3	100	-	-	-	-
Common Redpoll *Acanthis flammea*	-	-	0,8	1300	-	-	-	-	-	-
Rosy Finch *Leucosticte arctoa*	-	-	2,0	3200	-	-	-	-	-	-
Common Rosefinch *C. erythrinus*	-	-	6,0	9600	4,5	400	1,0	200	-	-
Pine Grosbeak *P. enucleator*	-	-	3,0	4800	1,3	100	18,0	3200	-	-
Rustic Bunting *E. rustica*	-	-	-	-	-	-	22,0	4000	-	-
Yellow-breasted Bunting *E. aureola*	-	-	-	-	1,0	80	3,3	600	-	-
Lapland Longspur (Laapland Bunting) *C. lapponicus*	27,0	27000	6,0	9600	10,0	800	-	-	-	
Total	**97,82**	**106620**	**166,6**	**258800**	**374,1**	**30060**	**78,4**	**14040**	**2019,7*** **10**	**403740*** **2200**

*** -** Numerator is the number of birds nesting at the rocky eastern coast, denominator is that at the western coast

The first place by the species diversity belongs to passerines (27 species or 34% of the total number of nesting birds without birds of prey and owls). Next are ducks (13 species or 16%), auks (11 species or 14%), waders (10 species or 13%), and gulls (9 species or 11%). Passerines are the first by the nesting density (77.5-282.6 pairs/sq. km) in various biotopes. In nesting period the total number of passerines is 360,000 birds (44% of the total number of nesting birds). Next in abundance are gulls (>262000, 32%) and auks (> 127,000 birds, 16%). Table 5.

Table 3: The number of birds in the "Karaginsky Island" Ramsar site at the nesting period (by orders)

	Population density (pairs/sq.km) and total number (individuals) of some species in various habitats									
Species group	Floodplain forest		Betula ermanii forest		Siberian dwarf-pine elfin woods		Tundra and bogs (open woodless areas)		Bank scarps	
	Population density	Number	Population density	Number	Population density	Number	Population density	Number	Population density	Number
Loons	0,31	620	-	-	-	-	-	-	-	-
Grebes	0,02	40	-	-	-	-	-	-	-	-
Shearwaters	-	-	-	-	-	-	-	-	0,2	40
Cormorants	-	-	-	-	-	-	-	-	100,0	20000
Geese	5,71	11420	3,1	5000	48,0	3420	-	-	-	-
Gallinaceous birds	1,8	1800	10,0	16000	5,0	400	-	-	-	-
Waders	2,7	2900	0,1	200	13,3	1060	-	-	-	-
Gulls	1,78	4340	-	-	25,2	2300	-	-	1280,0	256000
Auks	-	-	-	-	-	-	-	-	638,5	-
Cuckoos	-	-	0,14	220	-	-	0,5	90	-	-
Woodpeckers	-	-	-	-	-	-	0,4	70	-	-
Passerines	86,5	85500	103,3	237380	282,6	22880	77,5	13880	11,0	2200
Total	**97,82**	**106620**	**166,6**	**258800**	**374,1**	**30060**	**78,4**	**14040**	**2019,7*** **10**	**403740*** **2200**

***** - Nominator is the number of birds, nesting on rocky eastern coast; denominator is that number on the

lowland eastern coast

Table 4: The number of major bird species in the "Karaginsky Island" Ramsar site at the postbreeding period

	Density (pairs/sq.km) and total number (individuals) of some species in various habitats									
Species	Floodplain forest		Betula ermanii forest		Siberian dwarf-pine elfin woods		Tundra and bogs (open woodless areas)		Bank scarps	
	Population density	Number	Population density	Number	Population density	Number	Population density	Number	Population density	Number
1	2	3	4	5	6	7	8	9	10	11
Red-throated Loon (Red-throated Diver) *G. stellata*	0.3	660	-	-	-	-	-	-		-
Arctic Loon *G. arctica*	0,01	20	-	-	-	-	-	-		-
Red-necked Grebe *P. grisegena*	0,02	60	-	-	-	-	-	-		-
Northern Fulmar *Fulmarus glacialis*	-	-	-	-	-	-	-	-	0,5	50
Pelagic Cormorant (Pelagic Shag) *Ph. pelagicus*	-	-	-	-	-	-	-	-	220,0	22000
Mallard *A. platyrhynchos*	0,1	440	-	-	11,0	440	-	-		-
Green-winged Teal *A. crecca*	2,0	8800	-	-	33,0	1320	-	-		-
Eurasian Wigeon *A penelope*	0,1	440	-	-	11,0	440	-	-		-
Pintail *A. acuta*	1,6	7040	-	-	55,0	2200	-	-		-
Tufted duck *A. fuligula*	0,3	1320	-	-	44,0	1760	-	-		-
Greater Scout *A. marila*	0,2	880	-	-	11,0	440	-	-		-
Harlequin Duck *H. histrionicus*	-	-	13,6	11000	-	-	-	-		-
Oldsquaw *Clangula hyemalis*	0,01	50	-	-	-	-	-	-		-
Common Goldeneye *Bucephala clangula*	-	-	-	-	44,0	50	-	-		-
Common Eider *Somateria mollissima*	0,4	1760	-	-	-	-	-	-		-
Black Scoter *Melanitta americana*	0,5	2200	-	-	-	-	-	-		-
White-winged Scoter *M.deglandi*	0,3	1320	-	-	-	-	-	-		-
Red-breasted Merganser *M. serrator*	0,2	880	-	-	2,2	880	-	-		-
Willow Ptarmigan *L. lagopus*	1,8	5200	34,8	27800	-	-	-	-		-

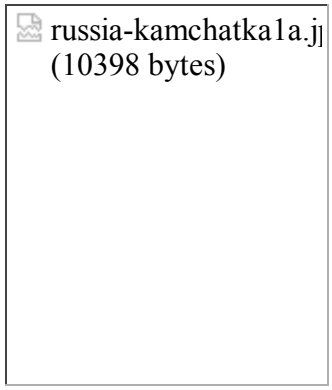
Table 4 continued

1	2	3	4	5	6	7	8	9	10	11
Rock Ptarmigan *L. mutus*	-	-	23,2	18600	29,0	1200	-	-		-
Mongolian Plover *Charadrius mongolus*	-	-	0,3	280	-	-	-	-		-
Wood sandpiper *T. glareola*	1,4	700	-	-	7,0	280	-	-		-
Greenshank *T. nebularia*		-		-	7,0	280	-			-
Gray-tailed Tattler *Heter.brevipes*	-	-	-	-	5,6	220	-	-		-
Common Sandpiper *Actitis hypoleucos*	-	-	-	-	3,6	140	-	-		-
Terek Sandpiper *Xenus cinereus*		-		-	7,0	280	-	-		-

Northern (Red-necked) Phalarope *Ph.lobatus*	0,6	560		-		-	-	-		-
Long-toed Stint *C.subminuta*	2,8	1400	-	-	-	-	-	-		-
Dunlin *C. alpina*	2,8	1400	-	-	-	-	-	-		-
Common Snipe *G. gallinago*	-	-	-	-	7,0	280	-	-		-
Parasitic Jaeger (Arctic Skua) *S. parasiticus*	0,6	2800	-	-	-	-	-	-		-
Long-tailed Jaeger *S.longicaudus*	2,4	1400	-	-	-	-	-	-		-
Common Black-headed Gull *L. ridibundus*	0,05	50	-	-	-	-	-	-		-
Slaty-backed Gull *L schistisagus*	-	-	-	-	-	-	-	-	192,0	19200
Mew Gull *L. canus*	-	-	-	-	12,0	480	-	-		-
Black-legged Kittiwake *Rissa tridactyla*	-	-	-	-	-	-	-	-	2880,0	288000
Common Tern *S. hirundo*	0,1	120	-	-	3,0	120	-	-		-
Arctic Tern *S. paradisaea*	1,2	1200	-	-	30,0	1200	-	-		-
Aleutian Tern *S. aleutica*	0,3	240	-	-	24,0	960	-	-		-
Common Murre *Uria aalge*	-	-	-	-	-	-	-	-	132,0	132000
Thick-billed Murre (Brunnich's Gullemoth) *Uria lomvia*										
Pigeom Gullemot *Cepphus columba*	-	-	-	-	-	-	-	-	6,6	660
Marbled Murrelet *Brach. marmoratus*	-	-	-	-	-	-	-	-	1,1	110
Table 4 continued										
1	2	3	4	5	6	7	8	9	10	11
Kittlitz's Murrelet *Brach. brevirostris*	-	-	-	-	-	-	-	-	1,1	110
Ancient Murrelet *Synthliboramphus antiquus*	-	-	-	-	-	-	-	-	4,4	440
Crested Auklet *Aethia cristatella*	-	-	-	-	-	-	-	-	2,2	220
Least Auklet *Aethia pusilla*	-	-	-	-	-	-	-	-	1,1	110
Parakeet Auklet *Cyclorrhynchus psittacula*	-	-	-	-	-	-	-	-	2,2	220
Horned Puffin *Fratercula corniculata*	-	-	-	-	-	-	-	-	11,0	1100
Tufted Puffin *Lunda cirrhata*	-	-	-	-	-	-	-	-	55,0	5500
Common Cuckoo *C. canorus*	-	-	0,4	260	-	-	1,3	60	-	-
Oriental Cuckoo *C. saturatus*	-	-	-	-	-	-	0,9	50	-	-
Great Spotted Woodpecker *D. major*	-	-	-	-	-	-	1,8	80	-	-
Bank Swallow (Sand Martin) *Riparia riparia*	-	-	-	-	-	-	-	-	44,0	4400
Eurasian Skylark *A. arvensis*	17,6	8800	-	-	-	-	-	-	-	-

Indian (Olive) Tree Pipit *A. hodgsoni*	-	-	-	-	-	-	17,6	1500	-	-
Pechora Pipit *A. gustavi*	17,6	8800	-	-	11,0	400	-	-	-	-
Red-throated Pipit *A. cervinus*	110,0	55000	57,2	47800	136,4	5500	-	-	-	-
Yellow Wigtail *M. flava*	105,6	52800	83,6	66900	237,6	9500	-	-	-	-
Gray Wagtail *Motacilla cinerea*	-	-	-	-	28,6	1100	-	-	-	-
White(Pied)Wagtail *Motacilla alba*	4,4	2200	17,6	14000	19,8	900	-	-	-	-
Brown Shrike *L. cristatus*	-	-	2,2	1800	-	-	8,8	600	-	-
Nutcracker *N. caryocatactes*	-	-	0,9	700	-	-	4,4	400	-	-
(Common,Northern)Raven *C.corax*		-		-		-		-	4,4	440
Siberian Accentor *Prunella montanella*	-	-	0,4	350	-	-	-	-	-	-
Middendorff's Grasshopper Warbler *L.ochotensis*	-	-	57,2	45800	129,8	5300	8,8	600	-	-
Table 4 continued										
1	2	3	4	5	6	7	8	9	10	11
Arctic Warbler *Ph. borealis*	-	-	48,4	38700	365,2	14500	39,6	3500	-	-
Dusky Warbler *Ph. fuscatus*	-	-	28,2	22400	48,4	2000	-	-	-	-
Siberian Rubythroat *L.calliope*	-	-	35,2	28200	11,0	400	8,8	900	-	-
Bluethroat *L. svecica*	-	-	5,7	4400	52,8	2200	22,0	2000	-	-
Dusky Thrush *Turdus eunomus*	-	-	22,0	176400	123,2	5300	33,0	3000	-	-
Willow Tit *P. montanus*	-	-	-	-	-	-	3,1	200	-	-
Oriental Greenfinch *Ch. sinica*	2,2	1100	17,6	14100	5,7	200	-	-	-	-
Common Redpoll *Acanthis flammea*	-	-	8,8	2800	-	-	-	-	-	-
Rosy Finch *Leucosticte arctoa*	-	-	26,4	7000	19,8	-	4,4	-	-	-
Common Rosefinch *C. erythrinus*	-	-	13,2	21100	5,7	900	79,2	400	-	-
Pine Grosbeak *P. enucleator*	-	-	-	10600	-	200	96,8	7000	-	-
Rustic Bunting *E. rustica*	-	-	-	-	4,4	-	14,5	8800	-	-
Yellow-breasted Bunting *E. aureola*	-	-	-	-	4,4	200	14,5	1300	-	-
Lapland Longspur (Lapland Bunting) *C. lapponicus*	118,8	59400	26,4	21100	44,0	1800	-	-	-	-
Total	**424,68**	**229040**	**526,8**	**582090**	**1589,8**	**63370**	**345,0**	**30390**	**3509,2*** **48,4**	**469280*** **4840**

* - Nominator is the number of birds, nesting on rocky eastern coast; denominator is that number on the lowland eastern coast.



[go to file 3 of 6]

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The Ramsar Convention on Wetlands

Ramsar site management plans -- Russian Federation, Karaginsky Island (file 3)

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K A R A G I N S K Y I S L A N D

"KARAGINSKY ISLAND" RAMSAR SITE

(file 3 of 6)

Table 5: The number of birds in "Karaginsky Island" Ramsar site at the postbeeding period (species order)

	Density (pairs/sq.km) and total number (individuals) of some species in various habitats									
Species group	Floodplain forest		Betula ermanii forest		Siberian dwarf-pine elfin woods		Tundra and bogs (open woodless areas)		Bank scarps	
	Population density	Number	Population density	Number	Population density	Number	Population density	Number	Population density	Number
Loons	0,73	1360	-	-	-	-	-	-	-	-
Grebes	0,06	90	-	-	-	-	-	-	-	-
Shearwaters	-	-	-	-	-	-	-	-	0,5	50
Cormorants	-	-	-	-	-	-	-	-	220,0	22000
Geese	25,04	25130	13,6	11000	211,2	7530	-	-	-	-
Gallinaceous birds	10,4	5200	58,0	46400	29,0	1200	-	-	-	-
Sandpipers	7,6	4060	0,3	280	37,2	1480	-	-		-
Gulls	4,65	5810	-	-	69,0	2760	-	-	480,0	307200
Auks	-	-	-	-	-	-	-	-	216,7	140470
Cuckoos	-	-	0,4	260	-	-	2,2	110	-	-
Woodpeckers	-	-	-	-	-	-	1,8	80	-	-
Passerines	376,2	188100	454,5	524150	1243,4	50400	341,0	30200	48,4	4840
Total	**424,68**	**229040**	**526,8**	**582090**	**1589,8**	**63370**	**345,0**	**30390**	**3509,2*** **48,4**	**469280*** **4840**

Postbreeding period. To the end of breeding the density of bird (without nonbreeding birds) population in Betula ermanii forests of the wetland is 345 ind./sq. km; in tundra- 425; in Siberian dwarf-pine elfin woods- 527; in floodplain- to 1,590 ind./sq. km (Table 6).

Table 6: The number of waterfowl passing through the "Karaginsky island" Ramsar site

	Spring	**Autumn**

Species	Tundra and bog	Coastal water surface	Total	Tundra and bog	Coastal water surface	Total
1	2	3	4	5	6	7
Red-throated Loon (Red-throated Diver) *G. stellata*	-	5000	5000		5500	5500
Arctic Loon *G. arctica*	-	5000	5000		5500	5500
Yellow-billed Loon *Gavia adamsi*	-	1000	1000		1100	1100
Red-necked Grebe *P. grisegena*	-	500	500		1400	1400
Northern Fulmar *Fulmarus glacialis*	-	10000	10000		10800	10800
Pelagic Cormorant (Pelagic Shag) *Ph. pelagicus*	-	30000	30000		32400	32400
Bean goose *Anser fabalis*	200		200	440		440
Whooper swan *Cygnus cygnus*	100		100	220		220
Mallard *Anas platyrhynchos*	200		200	440		440
Green-winged Teal *Anas crecca*	5000		5000	11000		11000
Eurasian Wigeon *Anas penelope*	10000		10000	22000		22000
Pintail *Anas acuta*	10000		10000	22000		22000
Northern Shoveler *Anas clypeata*	100		100	220		220
Tifted Duck *Aythya fuligula* +Greater Scoup *Aythya marila*	5000	5000	10000	11000	11000	22000
Harlequin Duck *H. histrionicus*		20000	20000		44000	44000
Oldsquaw *Clangula hyemalis*		50000	50000		100,000	100,000
Common Goldeneye *Bucephala clangula*		100	100		220	220
Common Eider *S. mollissima*		20000	20000		44000	44000
King Eider *S. spectabilis*		1000	1000		2200	2200
Steller's Eider *Polysticta stelleri*		10000	10000		22000	22000
Black Scoter *M. americana*		20000	20000		44000	44000
White-winged Scoter *M. deglandi*		20000	20000		44000	44000
Red-breasted Merganser *Mergus serrator*		8000	8000	5000	12600	17600
Common Merganser *M. merganser*		4000	4000		8800	8800
Pacific Golden Plover *P. fulva*	200		200	280		280
Mongolian Plover *Ch. mongolus*		300	300		420	420

Ruddy Turnstone *Arenaria interpres*		200	200		280	280
Wood sandpiper *Tringa glareola*	500		500	700		700
Greenshank *Tringa nebularia*	500		500	700		700
Gray-tailed Tattler *H. brevipes*	1000		1000	1400		1400
Common sandpiper *Actitis hypoleucos*	500		500	700		700
Terek Sandpiper *Xenus cinereus*	500		500	7000		7000
Red (Gray) Phalapore *Ph. fulicarius*		1000	1000		14000	14000
Table 6 continued						
1	2	3	4	5	6	7
Northern (Red-necked) Ohalapore *Ph. lobatus*		50000	50000		70000	70000
Rufous-necked Stint *C. ruficollis*	10,000		10,000	14000		14000
Long-Toed Stint *C. subminuta*	500		500	700		700
Dunlin *Calidris alpina*	10,000		10,000	14000		14000
Sharp-tailed sandpiper *C. acuminata*	200		200	280		280
Common Shipe *Gallinago gallinago*	500		500	700		700
Whimbrel *N. phaeopus*	2000		2000	2800		2800
Pomarine Jaeger (Pomarine Skua) *St pomarinus*		200	200		240	240
Parasitic Jaeger *St. parasiticus*		500	500		600	600
Long-tailed Jaeger *St. longicaudus*		300	300		360	360
Common Black-headed Gull *Larus ridibundus*		500	500		600	600
Slaty-backed Gull *L. schistisagus*		40000	40000		48000	48000
Glaucous Gull *Larus hyperboreus*		500	500		600	600
Mew Gull *Larus canus*		10000	10000		12000	12000
Black-legged Kittiwake *Rissa tridactyla*		200000	200000		240000	240000
Common Tern *Sterna hirundo*		500	500		600	600
Arctic Tern *S. paradisaea*		2000	2000		2400	2400
Aleutian Tern *Sterna aleutica*		500	500		600	600
Common Murre (Guillemot) *Uria aalge* + Thick-billed Murre (Brunnich's Guillemot) *Uria lomvia*		100000	100000		108000	108000

Pigeon Guillemot *C columba*		1000	1000		1080	1080
Marbled Murrelet *Br. marmoratus*		200	200		220	220
Kittlitz's Murrelet *Br brevirostris*		200	200		220	220
Ancient Murrelet *Synthliboramphus antiquus*		1000	1000		1080	1080
Crested Auklet *Aethia cristatella*		1000	1000		1080	1080
Least Auklet *Aethia pusilla*		1000	1000		1080	1080
Parakeet Auklet *C. psittacula*		1000	1000		1080	1080
Horned Puffin *Fratercula corniculata*		1000	1000		1080	1080
Tufted Puffin *Lunda cirrhata*		10000	10000		10800	10800
Total	**37020**	**632500**	**669520**	**115580**	**806040**	**921620**

The total number of nesting birds and their offspring reaches 1,800,000 individuals. At this time the most numerous species are Black-legged Kittiwake (288,000), Dusky Thrush (185,000), Yellow Wagtail (130.000), Red-throated Pipit (108,000), and Common Murre and Thick-billed Murre (132,000 individuals) Table 6.

The total abundance of passerines to the end of the breeding season is about 800,000 or ~ 58% of the total number of birds (without nonbreeding), including 315,000 gulls and 140,000 auks (Table 5).

WATERFOWL MIGRATING THROUGH THE WETLAND

The wetland "Karaginsky Island" is on the Central Kamchatka migration way of waterfowl, waders, sea colonial, and other birds. Rich coastal marine water of the island provides birds with food during migration, moulting, and wintering.

Along the eastern Kamchatka coast an intense migration of geese and sea colonial birds is observed. Hundreds of oldsquaws, white-winged and black scoters, and three eider species pass through this wetland. Masses of auks, blacklegged kittiwakes and pelagic cormorants migrate to nesting grounds. Diving ducks and seabirds fly low over water and nearby the seashore. Bird flocks straighten their way to the north in order not to round Shipunsky, Kronotsky, Kamchatsky, and Ozernyi capes of the eastern Kamchatka coast.

Karaginsky Island is located on the way of migratory birds to the north of Ozernyi peninsula. The Central Kamchatka migration way of geese passes from the western coast of this peninsula to the northeast Kamchatka coast. Here, from the Malamvayam lagoon to the Ukinskaya inlet most of ducks and geese continue their way over the northeastern tundra. Other birds fly towards Karaginsky Island.

Diving ducks predominate among migratory birds. The number of them coming to Karaginsky Island for rest and feeding changes from year to year and is related to the ice regime and seasonal weather conditions. In the spring of 1976-1978 in coastal waters and lagoons of Karaginsky Island about 150,000-200,000 diving ducks had rest and feeding. River ducks are less numerous. In the spring of 1976 their number was 28,000-30,000 birds. The major area for bird rest and feeding is Yuznyi peninsula and valleys of the Malamvayam and Markelovskaya rivers (Gerasimov, 1979). The total number of migratory birds is 700,000 (waterfowl and water-related) in spring and about 900,000 birds in autumn (Table 6, 7).

Table 7: The number of waterfowl passing through the "Karaginsky island" Ramsar site

Species	**Spring**			**Autumn**		
	Tundra and bog	Coastal water surface	Total	Tundra and bog	Coastal water surface	Total
Loons		11000	11000		12100	12100
Grebes		500	500		1400	1400
Shearwaters		10000	10000		10800	10800
Cormorants		30000	30000		32400	32400
Ducks	30600	158100	188700	73220	232920	305240
Waders	6420	51500	57920	43260	84700	127960
Gulls		255000	255000		306000	306000
Auks		116400	116400		125720	125720
Total	**37020**	**632500**	**669520**	**115580**	**806040**	**921620**

MOULTING AND WINTERING WATERFOWL IN THE WETLAND

The coastal water of Karaginsky Island is an area for moulting of Harlequin Duck, Common Eider, White-winged Scoter, and Common Merganser (Gerasimov, 1972; 1979).

In the moulting period, small groups of harlequin ducks occur in the 50-m belt of the stony eastern coast on the island and in river mouths. Common eiders moult in various sites of the coastal water independently of the coastline pattern. Three moulting grounds of white-winged scoters are known: at the southern termination of the island, opposite the Gnunvayam mouth and in the Severnaya Bay.

Common Merganser starts moulting in lagoons and offshore. In the beginning of the moulting period mergansers occur regularly along the western island coast; in late July they move outward the shore and are dispersed throughout 1-km coastal area.

Steller's eider appears on the island in late June and is abundant in early July. In summer, the bird prefers the eastern stony coast and does not visit sandy terrain. The 200-m coastal area is a place of their residence (Gerasimov, 1979).

The total number of waterfowl and water-related birds that moult at the wetland territory exceeds 40,000 birds (Table 8).

Table 8: The number of moulting and wintering waterfowl at the "Karaginsky Island" Ramsar site

Species	Number in various periods (individuals)	
	Molting	Wintering
Red-throated Loon *Gavia stellata*	200	
Arctic Loon *Gavia arctica*	20	
Yellow-billed Loon (White-billed Diver) *Gavia adamsi*	20	
Hurlequin Duck *Histrionicus histrionicus*	3000	

Oldsquaw *Clanduls hyemalis*		10 000*
Common Eider *Somateria molissima*	2500	
King Eider *Somateria spectabilis*	100	
Steller's Eider *Polysticta stelleri*	5000	
Black Scoter Melanitta americana (M. nigra americana)	500	
White-winged Scoter Melanitta deglandi (M. fusca deglandi)	5000	
Red-breasted Merganser *Mergus serrator*	500	
Common Merganser *Mergus merganser*	3000	
Slaty-backed Gull *Larus schistisagus*	3000	
Glaucous Gull *Larus hyperboreus*	50	
Mew Gull *Larus canus*	500	
Black-legged Kittiwake *Rissa tridactyla*	10 000	
Total	**40 390**	**10 000**

Thousands of oldsquaws winter on Karaginsky Island. They move from one coastal areas of the island to other ones depending on the wind direction. The total number of wintering oldsquaws ranges depending on the ice regime and sometimes reaches 10,000 birds.

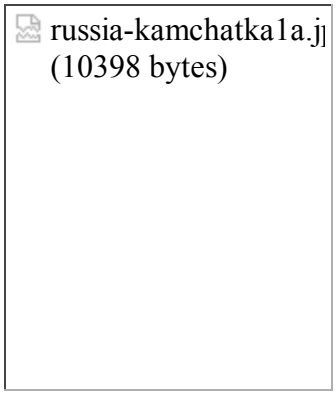
TOTAL NUMBER OF BIRDS USING THE WETLAND SITE

The annual total number of breeding, moulting, migratory and wintering birds using the Ramsar wetland "Karaginsky Island" is not more than 2 million birds including >630,000 gulls; 420,000 ducks, and > 260,000 auks (Table 9).

Table 9: The total number of the birds using the "Karaginsky Island" Ramsar site

	Number of species groups (ind.)						
Species	Nesting	Postnesting	Molting	Wintering	Spring migratory	Autumn migratory	Total
Loons	620	1360	240	-	11000	12100	13700
Grebes	40	90	-	-	500	1400	1490
Shearwaters	40	50	-	-	10000	10800	10850
Cormorants	20000	22000	-	-	30000	32400	54400
Geese	19840	23660		10000	188700	384440	418100
Gallinaceous birds	18200	52800		-	-	-	52800
Waders	3600	5820	-	-	77900	127960	133780
Gulls	260240	315770	13550	-	255000	306000	635320
Auks	127700	140470	-	-	116400	125720	266190
Cuckoos	330	370		-	*	*	370
Woodpeckers	70	80		-	-	-	80
Passerines	361740	797690		-	*	*	797690
Total	**812420**	**1360160**	**30390**	**10000**	**589500**	**1316500**	**2117210**

Note: * - the number is unknown



[go to file 4 of 6]

For further information about the Ramsar Convention on Wetlands, please contact the **Ramsar Convention Bureau**, Rue Mauverney 28, CH-1196 Gland, Switzerland (tel +41 22 999 0170, fax +41 22 999 0169, e-mail ramsar@ramsar.org). Posted on this Web site, 13 May 2001, Dwight Peck, Ramsar.

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The Ramsar Convention on Wetlands

Ramsar site management plans -- Russian Federation, Karaginsky Island (file 4)

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K A R A G I N S K Y I S L A N D

"KARAGINSKY ISLAND" RAMSAR SITE

(file 4 of 6)

PROTECTED BIRD SPECIES LISTED INTO THE RED DATA BOOK OF RUSSIA

The following birds inhabiting Karaginsky Island are listed into the Red Data Book of Russia:

- Yellow-billed Loon (White-billed Diver) is common in coastal areas during migration.
- Pacific Black Brant is a rare migratory species.
- Lesser White-fronted Goose is registered at the western coast of the island during spring migration. Its flocks are composed of about 40 birds.
- Snow Goose is an occasional bird. Several hundreds of birds were registered on the island in the spring of 1968.
- Golden eagle is a rare nesting species. There are two nesting grounds in birch forests of the Limimte and Mel'vayam river basins (southeastern coast).
- Stealer's Sea eagle nests on the island (3-5 pairs).
- Peregrine Falcon is a rare occasional bird.
- Gyrfalcon is a rare occasional bird.
- Eastern Curlew occurs on the island during migration.
- Ross's Gull (folks of 87 birds) is registered at the island coast.
- Aleutian Tern is a common nesting species.
- Marbled Murrelet occurs in summer and autumn at the coast of the Litke Inlet (the western island side).
- Kittlitz's Murrelet occurs at the island coasts in summer and may nest.

MAMMALS

TERRESTRIAL MAMMALS

According to the zoogeographical zoning, "Karaginsky Island" wetland belongs to the Siberian-European subregion, Beringian northern taiga province and is included into the Kamchatka area. Due to specific features of natural conditions and geological history of the region studied, the fauna of terrestrial mammals is characterised by a poor species composition, distinct endemism at the subspecies level, and by the combination of forest, tundra and mountain forms of mammals.

Only 13 species of mammals inhabit Karaginsky Island. Brown and polar bears are rarely met. Sometimes

they come or are brought with ice blocks. Reindeer is a domestic animal. Predators and rodents are residents (4 species in each order) on the island (Table 10).

Table 10: Terrestrial mammals of the "Karaginsky Island" Ramsar site

Species	Density Ind./sq. km	Number (ind.)
Sorex. caecutiens shrew	300-2600	582000-5044000
Alpine Hare Lepus timidus	0,68	1300
Northern Redbacked vole Clethrionomys rutilus	200-2800	388000-5432000
Large-toothed redback vole Clethrionomys rufocanus	200-2800	388000-5432000
Tundra vole Microtus oeconomus	200-2800	388000-5432000
Muskrat Ondatra zibethicus	?	100-300
Common Red Fox Vulpes vulpes	0,07-0,48	140-960
Brown Bear Ursus arctos		Rare visits
Polar Bear Ursus maritimus		Very rare visits (1969, 1977, 1987),
Sable Martes zibellina	0,03-0,05	60-100
Wolverine Gulo gulo	0,003-0,007	6-14
Weasel Mustela erminea	0,15-0,92	290-1780
Caribou Rangifer tarandus	2,0-3,0	400-600

Brown bears that were residents in the past were shot in the early 1930s. Later on, only single individuals were registered. The same is true for polar bears. The last visit of Polar Bear (on an ice block) was noted on the island in 1987. The rest mammals, given in Table 10, live on the island permanently.

Among shrews, Sorex caecutiens inhabits floodplain forests, light forests, Siberian dwarf-pine elfin woods, and boggy depressions with shrubs.

Mouse-like animals are widespread in birch forests, not so frequently in floodplain forests, and in openings grown with shrubs. The major type of habitats for Microtus oeconomus (tundra vole) is floodplain forests and moist shrub areas. The minimum number of all voles is in September-October.

Muskrat was brought to Karaginsky Island in 1928 and at present it lives in the Markelovskaya, Mimikinvayam, Gnunvayam rivers, and El'novaya lagoon. The minimum number of Muskrat is registered in April-May, maximum, in September-October.

Habitats of Alpine Hare are restricted to the forest areas - birch forests and alder elfin woods (breeding grounds) as well as to floodplain forests (feeding grounds).

Sable dwells only birch forests and river floodplains. Ermine occurs in river floodplains and shrub tundra, but it may be also met in birch forests and in elfin woods.

The major habitats for sable are birch forests and river floodplains. Ermine prefers floodplains and shrub tundra, though one may meet this animal in birch forests and elfin –woods.

The major habitats of Fox on the island are coasts.

The 3-year cycles are characteristic of the number of shrews. These cycles determine 3-4-year ones for the number of myophagous predators – Ermine, Sable, and Fox, though their cycles are shifted by 1-2 years with respect to the dynamics of shrews and voles. Alpine Hare has 6-8-year cycles of its number. There are no similar data for other mammals because of their small number and a short period of observations.

The limiting factors for Sable are small areas or the absence of high forests, shelters, sites for breeding and feeding. The major limiting parameter for Muskrat is the ice regime of water pools. The numbers confines status of other mammals.

PINNIPEDIA MAMMALS

Some representatives of pinnipeds occur in the wetland (Burkanov, 1988).

Common Seal (Larga). Major breeding grounds on the Kamchatka eastern coast are the Karaginsky and Ozernovsky inlets (see fig. 4). In the period of salmon passage large groups of seals concentrate at the northern and southern terminations of Karaginsky Island (about 2,500 and 3,500 animals, respectively).

As the intensity of salmon run decreases, the seals move from the river mouths to the eastern coast because people trouble the animals here. The number of seals is over 9,300 animals. In low tides seal-rookeries are formed on reefs of the Kalelagryvayam River (around 800 animals), at the western coast of the Golenishchev cape (300), at the Gorbatov cape (400), on Ptichii Island (500), at the Promezhutochnyi cape (600), and on reefs from western and eastern coasts of Krasheninnikov cape (3,000 animals).

Except the seal-rookeries mentioned, the seals concentrate in small groups on reefs at the eastern coast of the island.

Ringed Seal. Breeding grounds of this animal are throughout the Kamchatka eastern coast (the major its areas are in the southern part of the Ozernyi Bay adjacent to the Kamchatka coast and the Karaginsky Bay). The population of these animals in the Karaginsky Bay is low for the breeding period. The animals stay on large ice blocks. In spring of 1985 their number did not exceed 5,000-6,000 animals (Burkanov). As moulting stops and ice disappears, the animals are innoticable.

Bearded seal. The major habitat of Bearded Seal is the Karaginsky Bay. Breeding takes place at the northern termination of Karaginsky Island, in the Inlet of Litke and southern part of the bay that is adjacent to the Rusakovaya, Ivashka rivers and the Ozernovsky Peninsula coast. Later, with ice drift, bearded seals move from the northern part of the bay southward. In May of 1983, the number of animals was estimated at over 2,000 animals.

Ribbon Seal. In the littoral, these animals are observed only on ice, predominantly at the northeastern coast – in the zone including Karaginsky Island. At the period without ice Ribbon Seals occur occasionally. In mid-May the number of this animal increases. When the period of moulting starts, the animals go to the ice and stay there for a longer time. The ice remains only in the southern part of the Karaginsky Bay. In 1994 the number of Ribbon Seals was 15,800 animals. Later on, after ice melting, these animals transfer to the pelagic way of life, go away offshore and do not appear at the coast.

Eared seal inhabits the Kamchatka coast the year round. Animals concentrate in winter in the areas of fishery. The recent distribution of coastal breeding grounds of Eared Seal on Karaginsky Island is shown in Fig 4. Major breeding grounds are at the Krasheninnikov cape. The breeding grounds are located on two high small reefs-islands where the animals stay from May to October. In winter and autumn, the number of animals does not exceed 100; in summer, 500-700 animals. Only young animals occur on breeding grounds.

Walrus is spread at the northeast coast of Kamchatka beginning from the Karaginsky Bay. It occurs the year round, but the most numerous in late autumn-winter. In spring small groups of the animals are on ice blocks at the northern area of the island. In late May it may be observed in the Inlet of Litke and at the southern part of the Karaginsky Bay with drifted ice. Beginning from mid-May, Walrus is distributed throughout littoral along the western coast of Karaginsky Island and in the northern part of the Litke Strait. In these regions during the period without ice Walrus occurs in water by groups of 5-8 to 150-200 and more animals. At the same regions not so far from feeding grounds, Walrus forms rookeries being there from May to mid-October. The number of animals on the rookeries is about 1,000 animals.

FISH RESOURCES

One hundred and seventy-three species and subspecies of 45 families and 19 orders represent the ichthyofauna of the "Karaginsky Island" Ramsar site. Salt-water fishes are 161 taxa (93.1% of the ichthyofauna), anadromous and semianadromous ones - 11 (6.4%) and 1 (0.6%), respectively (Table a). Among anadromous and semianadromous fish, Salmonidae family (6 species, 3.5%) predominates; among salt-water ones, Cottidae (29, 16.8%), Pleuronectidae (16, 9.2%) Stichaeidae (11, 6.4%), Agonidae (10, 5.8%), Liparidae (10, 5.8%), and Zoarcidae (1 species, 4.6%).

Table 11: Checklist of fish and their residence in the Ramsar wetland "Karaginsky Island"

Taxon	Resistance and abundance
FISH	
Cephalaspidomorphi Class – Lampreys	
Petromyzontiformes order – Lampreys	
Petromyzontidae family- Lampreys	
Entosphenus tridentatus (Gairdner in Richardson, 1836) – ????????? ??????	RM
Lethenteron camtschaticum (Tilesius, 1811) – Arctic lamprey	CM
Chondrichthyes Class - Cartilaginous fish	
Lamniformes order – Mackerel Sharks	
Lamnidae family- Mako Sharks	
Lamna ditropis Hubbs et Follett, 1947 - Salmon Shark	CM
Squaliformes order – Dogfish Sharks	
Squalidae family– Dogfish Sharks	
Somniosus pacificus Bigelow et Schroeder, 1944 Spiny dogfish	RO
Squalus acanthias Linnaeus, 1758 - Pacific sleeper shark	RM
Rajiformes order – Rays, Skates	
Pseudorajidae family – Rays, Skates	
Bathyraja aleutica (Gilbert, 1896) - Aleutian Skate	RM
Rhinoraja interrupta (Gill et Townsend, 1897)	CP
Bathyraja maculata Ishiyama et Ishihara, 1977	RM

Bathyraja parmifera (Bean, 1881) - Alaska Skate	CP
Bathyraja violacea (Suvorov, 1935) - Okhotsk Skate	CP
Osteichthyes Class – Bony Fish	
Acipenseriformes order – Sturgeons	
Acipenseridae family – Sturgeons	
Acipenser medirostris Ayres, 1854 Green Sturgeon	RM
Anguilliformes order	
Nemichthyidae family	
Avocettina infans Gunther, 1878	RM
Clupeiformes order – Herrings, Sardines	
Clupeidae family – Herrings, Sardines	
Clupea pallasii Valenciennes in Cuvier et Valenciennes, 1847 - Pacific Herring	AP
Sardinops melanostictus (Temminck et Schlegel, 1846) - Japanese Sardine	RM
Salmoniformes order – Salmonids	
Microstomatidae family – Deepsea Smelts	
Bathylagus pacificus Gilbert, 1890 – Slender Back Smelt	RO
Leuroglossus schmidti Rass, 1955 - Northern Smoothtongue	RO
Lipolagus ochotensis (Schmidt, 1938) - Popeye Blacksmelt	RO
Pseudobathylagus milleri (Jordan et Gilbert in Jordan et Evermann,1898)- Robust Blacksmelt	RO
Opisthoproctidae family – Spookfishes	
Macropinna microstoma Chapman, 1939 - Shishamo Smelt	RO
Osmeridae family – Smelts	
Hypomesus japonicus (Brevoort, 1856) - Shishamo Smelt	RM
Mallotus villosus catervarius (Pennant, 1784) - Pacific Capelin	RM
Osmerus mordax dentex Steindachner, 1870 - Toothed Smelt	CP
Salmonidae family – Salmons	
Oncorhynchus gorbuscha (Walbaum, 1792) - Pink Salmon	CP
Oncorhynchus keta (Walbaum, 1792) - Chum Salmon	CP
Oncorhynchus kisutch (Walbaum, 1792) - Coho Salmon	RM
Oncorhynchus nerka (Walbaum, 1792 - Sockeye Salmon	RM
Salvelinus leucomaenis (Pallas, [1814]) - White-spotted Salmon	CP
Salvelinus malma malma (Walbaum, 1792) - Dolly varden	CP

Stomiiformes order	
Gonostomatidae family – Anglemouths	
Cyclothone atraria Gilbert, 1905 - Black Bristlemouth	RO
Gonostoma gracile Gunther, 1878 - Slender Fangjaw	RO
Chauliodontidae family – Viperfishes	
Chauliodus macouni Bean, 1890 - Pacific Viperfish	RO
Melanostomiidae family – Scaleless Dragonfishes	
Tactostoma macropus Bolin, 1939 – Longfin Dragonfish	RO
Aulopiformes order	
Scopelarchidae family – Paperbones	
Benthalbella dentata (Chapman, 1939) - Northern Pearleye	RM
Notosudidae family – Waryfishes	
Scopelosaurus harryi (Mead in Mead et Taylor, 1953) – Scaly Waryfish	RM
Paralepididae family – Barracudinas	
Arctozenus risso (Bonaparte, 1840) - White Barracudina	RM
Anotopteridae family – Daggertooths	
Anotopterus nikparini Kukuev, 1998 - North Pacific Daggertooth	RM
Alepisauridae family – Lancetfishes	
Alepisaurus ferox Lowe, 1833 - Longnose Lancetfish	RM
Myctophiformes order	
Myctophidae family - Lanternfishes	
Diaphus theta Eigenmann et Eigenmann, 1890 - California Headlightfish	RO
Lampanyctus jordani Gilbert, 1913 - Brokenline Lampfish	RO
Lampanyctus regalis (Gilbert, 1892) - Pinpoint Lampfish	RO
Protomyctophum thompsoni (Chapman, 1944) Bigeye Lanternfish	RO
Stenobrachius leucopsarus (Eigenmann et Eigenmann, 1890) – Northern Lampfish	RO
Stenobrachius nannochir (Gilbert, 1890) - Garnet Lampfish	RO
Tarletonbeania taylori Mead, 1953 - Taillight Lanternfish	RO
Gadiformes order – Soft-Finned Fishes	
Moridae family – Deepsea Cods	
Laemonema longipes Schmidt, 1935 - Longfin Codling	RM
Gadidae family – Codfishes	
Eleginus gracilis (Tilesius, 1810) – Saffron Cod	AP

Gadus macrocephalus Tilesius, 1810 – Pacific Cod	CP
Theragra chalcogramma (Pallas, [1814]) – Walleye Pollock	CP
Beloniformes order – Synentognaths	
Scomberesocidae – Sauries	
Cololabis saira (Brevoort, 1856) – Pacific Saury	RM
Beryciformes order – Berycoid Fishes	
Melamphaidae family – Bigscales	
Melamphaes lugubris Gilbert, 1890 - Highsnout Bigscale	RO
Poromitra crassiceps (Gunther, 1878) - Crested Bigscale	RO
Zeiformes order – Zeomorphs	
Oreosomatidae family – Dories	
Allocyttus verrucosus (Gilchrist, 1906) – Coster Dory	RM
Gasterosteiformes order- Sticklebacks	
Gasterosteidae family – Sticklebacks	
Gasterosteus aculeatus Linnaeus, 1758 - Three-spine Stickle	AP
Pungitius pungitius pungitius (Linnaeus, 1758- Nine-spine Stickle	AP
Scorpaeniformes order – Scorpion Fishes	
Sebastidae family- Rockfishes	
Sebastes aleutianus (Jordan et Evermann, 1898) - Rougheye Rockfish	RM
Sebastes alutus (Gilbert, 1890) - Pacific Ocean Perch	CM
Sebastes borealis Barsukov, 1970 - Shortraker Rockfish	RM
Sebastes glaucus Hilgendorf, 1880- Gray Rockfish	CP
Sebastes polyspinis (Taranetz et Moiseev in Taranetz,1933)- Northern Rockfish	RM
Sebastolobus alascanus Bean, 1890 - Shortspine Thornyhead	RM
Anoplopomatidae family- Sablefishes	
Anoplopoma fimbria (Pallas, [1814]) - Sablefish	RM
Hexagrammidae family - Greenlings	
Hexagrammos lagocephalus (Pallas, 1810) - Rock Greenling	CP
Hexagrammos octogrammus (Pallas, 1810) - Masked Greenling	AP
Hexagrammos stelleri Tilesius, 1810 - Whitespotted Greenling	AP
Pleurogrammus monopterygius (Pallas, 1810) - Atka Mackerel	CP
Cottidae family- Sculpins	
Artediellus camchaticus Gilbert et Burke,1912 - Clownfin Sculpin	CP

Artediellus gomojunovi Taranetz, 1933 - Spinyhook Sculpin	RM
Artediellus miacanthus Gilbert et Burke, 1912 - Smallhook Sculpin	CP
Artediellus ochotensis Gilbert et Burke, 1912 - Okhotsk Hookear Sculpin	RP
Artediellus pacificus Gilbert, 1896 - Paddled Sculpin	CP
Enophrys diceraus (Pallas, 1787) – Antlered Sculpin	CP
Gymnacanthus detrisus Gilbert et Burke, 1912 - Purplegray Sculpin	CP
Gymnacanthus galeatus Bean, 1881 - Armorhead Sculpin	AP
Gymnacanthus pistilliger (Pallas, [1814]) - Threaded Sculpin	AP
Hemilepidotus gilberti Jordan et Starks, 1904 - Banded Irish Lord	AP
Hemilepidotus jordani Bean, 1881 - Yellow Irish Lord	CP
Icelus canaliculatus Gilbert, 1896 - Blacknose Sculpin	RM
Icelus spatula Gilbert et Burke, 1912 - Spatulate Sculpin	CP
Icelus spiniger Gilbert, 1896 - Thorny Sculpin.	CM
Icelus uncinalis Gilbert et Burke, 1912- Uncinate Sculpin	RM
Megalocottus platycephalus (Pallas, [1814]) - Belligerent Sculpin	AP
Melletes papilio Bean, 1880 - Butterfly Sculpin	CP
Microcottus sellaris (Gilbert, 1896) - Brightbelly Sculpin	CP
Myoxocephalus jaok (Cuvier in Cuvier et Valenciennes, 1829) - Plain Sculpin	CP
Myoxocephalus niger (Bean, 1881) - Warthead Sculpin	CP
Myoxocephalus polyacanthocephalus (Pallas, [1814]) - Great Sculpin	AP
Myoxocephalus stelleri Tilesius, 1811 - Frog Sculpin	AP
Myoxocephalus verrucosus (Bean, 1881) - Warty Sculpin	CP
Stelgistrum beringianum Gilbert et Burke, 1912 - Smallplate Sculpin	RM
Stelgistrum concinnum Andriashev, 1935- Largeplate Sculpin	RP
Triglops forficatus (Gilbert, 1896) - Scissortail Sculpin	CM
Triglops metopias Gilbert et Burke, 1912 - Highbrow Sculpin	RP
Triglops pingelii Reinhardt, 1837 - Ribbed Sculpin	AP
Triglops scepticus Gilbert, 1896 - Spectacled Sculpin	RM
Hemitripteridae family - Sea Ravens	
Blepsias bilobus Cuvier in Cuvier et Valenciennes, 1829 - Crested Sculpin	CP
Blepsias cirrhosus (Pallas, [1814]) - Silverspotted Sculpin	CP
Hemitripterus villosus (Pallas, [1814]) - Shaggy Sea Raven	CP

Nautichthys pribilovius (Jordan et Gilbert in Jordan et Evermann, 1898) - Eyeshade Sculpin	CP
Nautichthys robustus Peden, 1970 - Shortmast Sculpin	RP
Ulca bolini (Myers, 1934) - Bigmouth Sculpin	RM
Psychrolutidae family - Soft Sculpins	
Dasycottus setiger Bean, 1890 - Spinyhead Sculpin	RM
Eurymen gyrinus Gilbert et Burke, 1912 - Smoothcheek Sculpin	RP
Gilbertidia sigalutes (Jordan et Starks, 1895)- Soft Sculpin	RM
Malacocottus zonurus Bean, 1890 - Spinycheek Blobsculpin	RM
Psychrolutes paradoxus Gunther, 1861 - Tadpole Sculpin	RP
Agonidae family - Sea Poachers	
Aspidophoroides bartoni Gilbert, 1896 - Aleutian Alligatorfish	R?
Bathyagonus nigripinnis Gilbert, 1890 - Blackfin Starsnout	RM
Hypsagonus quadricornis (Valenciennes in Cuvier et Valenciennes,1829) - Fourhorn Poacher	CP
Occella dodecaedron (Tilesius, 1813) - Bering Poacher	CP
Pallasina barbata (Steindachner, 1876) – Northern Tubenose Poacher	CP
Percis japonica (Pallas, 1769) - Dragon Poacher	RM
Podothecus accipenserinus (Tilesius, 1813) - Sturgeon poacher	CP
Podothecus veternus Jordan et Starks, 1895 - Veteran Poacher	CP
Sarritor frenatus (Gilbert, 1896) - Sawback Poacher	RM
Sarritor leptorhynchus (Gilbert, 1896) - Longnose Poacher	CP
Cyclopteridae family- Lumpsuckers	
Aptocyclus ventricosus (Pallas, 1769) - Smooth Lumpsucker	CM
Eumicrotremus andriashevi Perminov, 1936 - Pimpled Lumpsucker	RP
Eumicrotremus asperrimus (Tanaka, 1912) - Siberian Lumpsucker	RM
Eumicrotremus orbis (Gunther, 1861) - Pacific Spiny Lumpsucker	CP
Lethotremus muticus Gilbert, 1896 - Docked Snailfish	RP
Liparidae family - Snailfishes	
Careproctus furcellus Gilbert et Burke, 1912	RM
Careproctus rastrinus Gilbert et Burke, 1912 - Salmon Snailfish	RM
Crystallichthys mirabilis (Jordan et Gilbert in Jordan et Evermann, 1898) - Blotched Snailfish	RM
Liparis callyodon (Pallas, [1814]) - Spotted Snailfish	CP

Liparis cyclopus Gunther, 1861 - - Ribbon Snailfish	RP
Liparis gibba Bean, 1881 -Variegated Snailfish	CP
Liparis ochotensis Schmidt, 1904 - Okhotsk Snailfish	CP
Lipariscus nanus Gilbert, 1915 - Pygmy Snailfish	RO
Nectoliparis pelagica Gilbert et Burke, 1912 - Tadpole Snailfish	RO
Rhinoliparis barbulifer Gilbert, 1896 - Longnose Snailfish	RO
Perciformes order - Perch-like Fishes	
Bathymasteridae family - Searchers	
Bathymaster signatus Cope, 1873 - Searcher	CP
Zoarcidae family - Eelpouts	
Bothrocara mollis Bean, 1890 - Soft Eelpout	RM
Gymnelus hemifasciatus Andriashev, 1937 - Halfbarred Pout	CP
Gymnelus pauciporus Anderson, 1982 - Poorpore Pout	RP
Lycodapus derjugini Andriashev, 1935	RO
Lycodapus fierasfer Gilbert, 1890 - Blackmouth Eelpout	RO
Lycodes concolor Gill et Townsend, 1897 - Ebony Eelpout	RM
Lycodes palearis Gilbert, 1896 - Wattled Eelpout	CP??
Lycodes raridens Taranetz et Andriashev in Andriashev, 1937 - Marbled Eelpout	CP
Stichaeidae family - Pricklebacks	
Alectrias alectrolophus (Pallas, [1814]) - Stone cockscomb	AP
Anisarchus medius (Reinhardt, 1837) – Stout Eelblenny	RP
Ascoldia knipowitschi Soldatov, 1927 - Mud Prickleback	RP
Bryozoichthys lysimus (Jordan et Snyder, 1902) - - Nutcracker Prickleback	RP
Chirolophis snyderi (Taranetz, 1938) - Bearded Warbonnet	RP
Eumesogrammus praecisus (Kroyer, 1837) - Fourline snakeblenny	RP
Leptoclinus maculatus diaphanocarus (Schmidt,1904)- Pacific Daubed Shanny	CP
Lumpenella longirostris (Evermann et Goldsborough, 1907) - Longsnout Prickleback	RM
Lumpenus sagitta Wilimovsky, 1956 - Snake Prickleback	CP
Opisthocentrus ocellatus (Tilesius, 1811) – Ocellated Bienny	CP
Stichaeus punctatus (Fabricius, 1780) - Arctic Shanny	CP
Pholididae family- Gunnels	
Pholis fasciata (Bloch et Schneider, 1801) - Banded Gunnel	CP
Rhodymenichthys dolichogaster (Pallas, [1814]) - Stipled Gunnel	AP

Anarhichadidae family – Wolffishes	
Anarhichas orientalis Pallas, [1814] - Bering Wolffish	RP
Ptilichthyidae family - Quillfishes	
Ptilichthys goodei Bean, 1881 – Guillfish	RP
Zaproridae family – Prowfishes	
Zaprora silenus Jordan, 1896 – Prowfish	RM
Trichodontidae family - Sandfishes	
Trichodon trichodon (Tilesius, 1813) - Pacific Sandfish	CP
Ammodytidae family - Sand Lances	
Ammodytes hexapterus Pallas, [1814] – Pacific Sand Lance	CP
Pleuronectiformes order - Flatfishes, Flounders	
Pleuronectidae family - Flatfishes, Flounders	
Atheresthes evermanni Jordan et Starks, 1904 - Kamchatka Flounder	CM
Atheresthes stomias Jordan et Gilbert, 1880 - Arrowtooth Flounder	RM
Clidoderma asperrimum (Temminck et Schlegel, 1846) - Roughskin Sole	RM
Glyptocephalus stelleri (Schmidt, 1904) - Korean Flounder	RM
Glyptocephalus zachirus Lockington, 1879 - Rex Sole	RM
Hippoglossoides elassodon Jordan et Gilbert, 1880 - Flathead Sole	CP
Hippoglossoides robustus Gill et Townsend, - Bering Flounder	CP
Hippoglossus stenolepis Schmidt, 1904 - Pacific halibut	AP
Lepidopsetta cf. bilineata (Ayres, 1855) - Northern Rock Sole	AP
Limanda aspera (Pallas, [1814]) Yellowfin Sole	AP
Limanda sakhalinensis Hubbs, 1915 Sakhalin Sole	CP
Myzopsetta proboscidea (Gilbert, 1896) – Longhead Sole	AP
Platichthys stellatus (Pallas, 1787) – Slarry Flounder	AP
Pleuronectes glacialis Pallas, 1776 – Arctic Flounder	AP
Pleuronectes quadrituberculatus Pallas, [1814] – Alaska Plaice	AP
Reinhardtius hippoglossoides matsuurae Jordan et Snyder, 1901 - Pacific Black Halibut	RM

Designations:
Abundance: R- rare (frequency is <10% of the total catch in the habitat);
C- common (10-50%);
A- abundant (> 50%)
Residence: M- migratory
O- occasional
P- permanent

Ninety-two taxa 92 (53.2% of the ichthyofauna) are rare; 59 (34.1%), common; and 22 taxa (12.7%) are abundant. Permanent species are 89 taxa (51.4%); anadromous species, 59 (34.1%); and occasional, 24 species (14.4% of the ichthyofauna).

The number of neritic taxa is 8 (4.6%); epipelagic - 10 (5.9%); mesopelagic- 16 (9.2%); bathypelagic – 6 (3.5%); littoral – 4 (2.3%); inner sublittoral – 21 (12.1%); outer sublittoral – 68 (39.3%), mesobenthal (36 (20.8%), and batybenthal –1 (0.6%).

From the zoogeographical viewpoint, Pacific boreal (60 taxa, 34.7%), Arctic boreal (32, 18.5%), and Asiatic boreal (40, 23.1%) taxa are widespread.

Anadromous and semianadromous fishes are 12 taxa: abundant- 2 (16.7%); common – 6 (50.0%); rare taxa are 4 (33.3%). Permanent species are 5 (41.7%), anadromous– 7 (58.3%). Anadromous epipelagic, neritic, mesopelagic, and inner sublittoral fishes taxa amount to 6 (50.0%), 3 (25.0%), and 1 (8.3%), respectively; semianadromous ones – 1 (8.3%).

[go to file 5 of 6]

For further information about the Ramsar Convention on Wetlands, please contact the **Ramsar Convention Bureau**, Rue Mauverney 28, CH-1196 Gland, Switzerland (tel +41 22 999 0170, fax +41 22 999 0169, e-mail ramsar@ramsar.org). Posted on this Web site, 13 May 2001, Dwight Peck, Ramsar.

The Ramsar Convention on Wetlands

Ramsar site management plans -- Russian Federation, Karaginsky Island (file 5)

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K A R A G I N S K Y I S L A N D

"KARAGINSKY ISLAND" RAMSAR SITE

(file 5 of 6)

ROLE OF THE WETLAND IN FISH REPRODUCTION

The "Karaginsky Island" site is a spawning area for anadromous and migratory from the sea fish (Chum Salmon, Pink Salmon, Chinook Salmon, Sockeye Salmon, Coho Salmon, Rainbow (Steel-headed) Trout, Dolly Varden, Whitespotted Char, Toothed Smelt, and Great Siberian Sturgeon).Spawning grounds are located in many rivers, streams, river branches, lakes, and in mountain river parts. The fish prefer sandy-gravel of stony-gravel bottom grounds for their nests.

New young fish stay at the wetland for some time (for 0.5 to 2.5 years dependently on fish species) and then roll down the sea.

The major rivers used for spawning are the Markelovskaya, Mamikinvayam, Gnuvayam, and Yununvayam.

The general phenological pattern of biological cycles in the fish is shown in the text and the Table below.

Seasonal distribution of fish within "Karaginsky Island" site

May	June	July	August	September	October	November
				Spawning migration ==========		----------
December	January	February	March	April	May	June
Wintering in river ----------					Spawning +++	

VALUABLE ANADROMOUS SPECIES AND SUBSPECIES

Chum Salmon - *Oncorhynchus keta (Walbaum)*. The breeding period lasts from late spring to early

winter. Forty thousand individuals of this fish come for spawning to the Ramsar wetland.

Chinook (king) Salmon - *Oncorhynchus tschawytscha (Walbaum).* Spawning migration starts just after ice drift, its peaks are in June-July. Single individuals come to the rivers in September. Breeding is in July-August. A rare species in the wetland.

Sockeye Salmon - *Oncorhynchus nerka (Walbaum).* Spawning takes place in July-August. In some years it extends to October. At the wetland it is a relatively rare species, the number of which reaches 35,000 individuals with biomass about 70 tons (Table 12).

Coho Salmon - *Oncorhynchus kisutch (Walbaum).* Spawning migration starts in July and lasts to October. Mass migration starts later than in other salmons. The spawning proceeds from late August to late winter. About 2,000 fishes go to spawn to the wetland rivers.

Dolly Varden– *Salvelinus malma malma (Walbaum)* appears in the wetland to spawn in early autumn and breeds only in very cold water with fast current. It is a common species at the wetland. The number is unknown.

Table 12: Approximate number of salmons migrating for spawning to major rivers of the "Karaginsky Island" Ramsar site

River	Maximum number, ind.				
	Pink Salmon	Chum Salmon	Sockeye Salmon	Coho Salmon	TOTAL
Markelovskaya	2000000	10000	10000	2000	202000
Mimikinvayam	1000000	5000	10000	-	1015000
Gnuvayam	600000	20000	10000	-	630000
Yununvayam	400000	5000	5000	-	410000
TOTAL	**4000000**	**40000**	**35000**	**2000**	**4077000**

East Siberian char - *Salvelinus leucomaenis (Pallas).* Migrations to the wetland rivers last from July to September. Breeding takes place in late summer- early autumn, exclusively in flowing water, in river and deep stream channels. This fish, like Dolly **V**arden, goes to the sea for fattening, in autumn it out-migrates to freshwater for spawning and wintering in the wetland. Its number is low, the fish is of no commercial importance, but it is an object of sport fishing.

Toothed Smelt– ***Osmerus mordax dentex Steindachner.*** Spawning migration is observed in late May-June and lasts 10-14 days. Spawning takes place after ice drift, on gravel- sandy ground in fast current.

MASS NONCOMMERCIAL SPECIES AND SUBSPECIES

Arctic Lamprey – *Lethenteron camtschaticum (Tilesius)*. Adult fish go out of the sea to rivers in late autumn. In some years they are abundant in the wetland rivers.

***Threespine stickleback** – *Gasterosteus aculeatus Linnaeus* is abundant species in the wetland and has several morphoecological forms. Sea form breeds in summer in the coastal zone and does not go to rivers. *Anadromous form migrates to spawn from the sea to rivers from April to September and goes upstream for a large distance. Mass spawning takes place in July.

***Ninespine stickleback** – *Pungitius pungitius pungitius (Linnaeus)*. The fish has permanent and anadromous forms. Spawning is intermittent.

Currently, the nature protection regime of wetlands has no effect on conserving the water pools and fish resources. The causes of this fact are a lack of funding and some other purposes of establishing the protected area. There is only some juridical prohibition for certain human activities that needs further improvement.

There is no data on the fish yield within the wetland water area because of poor accounts of the enterprises.

1.2.3. INVENTORY OF VALUABLE NATURAL OBJECTS

SEA COLONIAL BIRD ROOKERIES

Four species of sea colonial birds form large nesting colonies located mostly on the eastern coast of the island.

Pelagic Cormorant forms the most abundant populations of the Bering Sea composed of 7,000 - 10,000 pairs. 1,000 -1,500 pairs are on Golenishchev cape. About 1,000 pairs of cormorants nest on the rookery located between the Komarovskaya River and Rovnyi cape (Gerasimov, 1986).

Slaty-backed Gull. According to the counts of 1969, about 15,000 bird pairs inhabited Karaginsky Island (including immature birds). The greatest nesting colony of this species is on Ptichii Island. Before 1970 about 1,300-1,500 pairs nested. About 1,000 nesting pairs of gulls dwell Kekurnyi cape and 550 pairs - Yuzhnyi cape (Gerasimov, 1986).

Black-legged Kittiwake. In 1966-1973, 205,000-240,000 bird pairs nested on the island. They formed 12 isolated bird colonies. The largest colony, consisting of 200,000 birds, was registered at the rookery between the Komarovskaya River and the Yuzhnyi cape (Gerasimov, 1986).

Tufted Puffin. The number of this bird on Karaginsky Island was estimated in 1970-1973 at 3,000-5,000. The largest colony (1,500 pairs) is registered on Ptichii Island (Gerasimov, 1986).

ROOKERIES OF SEA MAMMALS

Rookeries of sea mammals on Karaginsky Island are undoubtedly one of the valuable natural objects. Their characteristics are given in section - Mammals population, see also Fig.4

OTHER RARE AND NATURAL OBJECTS IMPORTANT FOR THE WETLAND

"Ptichii Island". A large multispecies bird colony is located on the island. This island was declared a nature monument of regional importance by the Decree of the Kamchatka Executive Council of People's Deputies (N 9, January 9, 1981).

Ptichii Island is at the eastern coast of Karaginsky Island opposite the Yaklegryvayam River mouth 1 km of the seashore. Its length is 350 m, breadth – 100 m, and elevation- 7-10 m. The island is flat with soils of 30-40 cm thick. About 1,500 pairs of Tufted Puffins, 1,500 Slaty-backed Gulls, 100 pairs of Pelagic Cormorants, and several pairs of Pigeon Guillemots nest here (Gerasimov, 1974).

"Walrus rookery on Semenovskaya Spit of Karaginsky Island" (Decree of the Kamchatka Executive Council of People's Deputies N 562, December 28, 1983).

Gnuvayam mineral springs (safety zone is 2sq. km) and **Yuzhnokaraginsky mineral springs** (safety zone is 2.4 sq. km) (Fig. 1). In 1992 some areas on Karaginsky Island were declared as specially protected natural areas (SPNA) at the status of nature monuments of local importance (Resolution of the Malyi Council of Regional Council of People's Deputies). However, these nature monuments needs status of

monuments of regional importance since there is no category "monuments of local importance" in the Law of RF about SPNA.

1.2.4. INVENTORY OF LAND USERS AND POPULATED AREAS AT THE SITE, WETLAND PROTECTION

STATE PROTECTION OF THE WETLAND

The protection of the wetland is within exclusive competence of the State Committee of Environmental Protection (Koryakekologia) of the Koryak Autonomous Area (KAO). In Tigil'sky administrative rayon, where "Karaginsky Island" is located, one state inspector of Koryakekologia works in Ossora (tel. 8 – (245)-41-409).

Fish resources protection. The conservation of fish and sea mammal resources is under the jurisdiction of the Koryak Area Inspection on fish resources protection and reproduction and regulation of fishery (KOIR). Address: Palana, Cubarova ul., 14, ap.15., tel. 8-4154332267.

The staff of KOIR in Karaginsky rayon includes 17 persons: 3 ichthyologists and 8 inspectors in Ossora (1 inspector is for sea mammals' protection). The village of Tymlat has 2 inspectors and 1 ichthyologist; Il'pyrsky village, 2 inspectors and 1 ichthyologist; Ivashka, 2 inspectors (tel. 8-245-41-556).

Protection of game animals. The Department for protection, control and regulation of using game animals of the KAO manages game animals and protected areas (zakaznik) the wetland.

At present the Karaginsky hunter's inspection includes three persons: chief (Ossora –tel. 8-245-47-380), 1 inspector (Ivashka), 1 hunter of the "Karaginsky Island" protected area (zakaznik) and 1 hunter in "Laguna Kazarok" zakaznik.

Forest fund protection. The protection and control over utilising the forest fund at the territory of the wetland are realised by the Koryak Forestry (Ossora) of the Kamchatka Forest Department (Petropavlovsk-Kamchatsky).

At the Karaginsky forest area of the Koryak Forestry the staff consists of 10 persons: 1 forester, 1 forester assistant and 3 forest rangers in Ossora; 1 forest ranger in Tymlat and 1 forest ranger in Ivashka. The administration of the Koryak Forestry is located in Ossora and consists of 11 specialists.

SPECIAL PROTECTED AREAS

The entire Karaginsky Island is a protected ***area (zakaznik) of regional importance named "Karaginsky Island"***(Fig. 4) (the term is prolonged until 2002). Bird hunting is forbidden.

The protected area (zakaznik) of regional (oblast) importance "Karaginsky Island" was organised by the Decree of the Kamchatka Regional Executive Committee for 5 years (N 284, April 12, 1974). The zakaznik was established to protect nesting grounds of sea colonial birds and to conserve all the bird species throughout Karaginsky Island, including 2-km littoral zone.

The bird hunting in the zakaznik is forbidden. The main goals of establishing the zakaznik are nature conservation and scientific research (Appendix N 3 to the Decree of the Kamchatka Regional Executive Committee, May 5, 1983, N 216).

The conservation activity of the zakaznik is within obligations of the Soviet side on implementing agreements according to the conventions for protection of migratory birds and their habitat between USSR and Japan, USSR and USA, and the Ramsar Convention. A special attention is paid to conserving sea colonial birds, geese and rare birds listed to the Red Data Book of RSFSR.

Scientific problems of the zakaznik are based on its importance as a standard natural complex (lagoons, sea spits, rocks grown with plats). The island is partially used as reindeer pastures and hayfields. Under

these conditions, there are some prerequsites for elaborating recommendations that would unite nature conservation problems and wise economic managing. On "Karaginsky Island" the regular phenological observations, counts of migratory waterfowl and water-related birds have been conducted.

NATURE USERS

GAME

Since the island is separated from populated areas, hunting for mammals is absent here.

LAND USE

The major land users on Karaginsky Island are as follows:

1. Enterprise "Ossora" - an area of 258.75 hectares is used for agricultural use (haying, reindeer pastures) without time limit. During the last two years the lands were not used for these purposes.

2. Fishing collective farm "Udarnik" possesses 392 hectares without time limit for agricultural use (haying, reindeer pastures).

3. Joint-stock company "Ossora" possesses 2 hectares without time limit. Special vats are set here for fish processing.

4. Municipal unitary agricultural enterprise "Agrofirma Rassvet" has 1 hectare without time limit (Fig.4).

FISHING

There are 11 areas for fishing by stationary net (Fig.4). The fishing is carried out by organisations of Karaginsky rayon. Since the control over fishery is unsatisfactory, the number of stationary nets exceeds considerably the permissible one. Official limits for fishing accounted for 1,103 tons in 1997; 224.3 tons in 1998, and 514.6 tons in 1999. By questionnaire, the fish yield within the wetland water areas is much higher than the accepted limits (Table 13) and official statistic data (Tables 13 and 14).

Table 13: Limits for catching salmons in rivers of "Karaginsky Island" Ramsar site, tons

River	Year	Fishing object				
		Pink Salmon	Chum Salmon	Sockeye Salmon	Coho Salmon	TOTAL
Markelovskaya	1997	540	6	2	-	548
	1998	56.9	3.3	1.2	-	61.4
	1999	290.3	-	1	1.5	292.8
Mamikinvayam	1997	270	4	2	-	276
	1998	81.3	2.2	1.2	-	84.7
	1999	145.1	-	1	-	146.1
Gnuvayam	1997	160	4	2	-	166
	1998	40.6	2.2	1.2	-	44
	1999	86	15	1	-	102
Yununvayam	1997	110	2	1	-	113

	1998	32.5	1.1	0.6	-	34.2
	1999	59.1	4	0.6	-	63.7
TOTAL		**1871.8**	**43.8**	**14.8**	**1.5**	**1931.9**

Table 14: Official data on fish catch of salmons in rivers of the Karaginsky Island Ramsar site, tons

Enterprise	River	Pink Salmon	Chum Salmon	Sockeye Salmon	Total
Nassina	Markelovskaya	200	-	-	200
	Mamikinvayam	200	-	-	200
Farkhad &Co		680	-	-	680

For 1999 the limits for fishing areas on the island were submitted to the following enterprises: Production association (PA) "Pankara", Private enterprise (PE) "Khimenko", Joint-stock company "Udarnik", "Fish Faktori", "Yagodnoe", and Nassina".

REINDEER RAISING

Reindeer raising has fallen down in the entire Koryak Area, the number of animals continues reducing. According to official data, only the company "Rassvet" possesses deer. In 1997 their number was 809, in 1998 – 678 animals**.**

PERMANENT AND TEMPORARY SETTLEMENTS

The adjacent to the wetland settlements are located on Kamchatka Peninsula (Fig. 4). Their total population is 910 including 703 residents (Table 15).

Table 15: Permanent and temporary settlements and other populated areas

Settlement	Population	Native population	Unemployed persons (Data of July 1, 1999)
Ossora	3447	379	209
Ilytyrskoe	570	111	24
Ivashka	1248	165	74
Kostroma	217	17	7
Karaga	633	383	36
Tymlat	910	703	68

OTHER ANTHROPOGENIC IMPACT ON THE SITE

A great danger for the wetlands is fires. Only in 1999 in the KAO more than 50,000 hectares of agricultural lands were exposed to fire.

The highest anthropogenic effect is restricted to the summer fishing. At this time on the island coast one can meet people that stock fish and fish eggs.

INVENTORY OF POLLUTION SOURCES

According to the Koryakecologia information of 1998, there are no ecologically dangerous objects within the wetland. Only some are on the catchment basin. Pollution of water may be dangerous in the case of accidents when transporting oil products to the settlements of Karaginsky and Olyutorsky rayons or to the northern Far East regions by the Bering Sea. Thirty-two fuels and lubricants storage of a total volume of

42,002 cubic m is known in the territory of Karaginsky and Olyutorsky rayons. The presence of this storage is not a threat for the wetland. However, the oil transportation by sea is potentially dangerous for the wetland. A feasible damage from the accidents related to the oil transportation is not estimated.

The planning oil and gas exploration of the Bering Sea shelf will exert a great negative influence on the wetland. The Decree of the RF Government on the oil exploration was cancelled. The further future is unknown.

1.2.5. State protection of the "Karaginsky Island"

Ramsar site

The protection of "Karaginsky Island" is within the exclusive competence of the State Committee on Environmental Protection of KAO –Koryakgoskomekologia (Koryakekologia) . The same organisation is responsible for protection of Rainbow (Steel-headed) Trout as a species listed to the Red Data Book of Russian Federation. Tigil'sky inspection of Koryakekologia consists of one inspector in the village of Tigil.

Protection of fish resources

The protection of fish resources and sea mammals is provided by the Koryak regional inspection of fish protection, reproduction, and fishery control (KOIR) (address: Palana, Chubarova ul., 14, ap. 15; telephone 8-41543-32267). The staff of KOIR consists of 4 persons in Ust-Khairyuzovo and one inspector in Khairyuzovo (tel. 8-(239)26-162). There are three vacancies for ichthyologists.

Protection of game animals

The Department of protection, control and regulation of using game animals of KAO (Palana) provides protection of game animals. Nowadays, chief of the regional game inspection works in Tigil'sky rayon (tel. 8-(237)21-475) and 2 hunters in Kovran and Ust-Khairyuzovo villages.

Protection of the forest fund

The Ust-Khairyuzovo division of the Tigil'sky Forestry of the Forest Department of KAO (Petropavlovsk-Kamchatsky) provides protection and control over utilising the forests within the wetland. The staff of the Ust-Khairuzovo division includes 6 persons (data of 2000): one forest warden, one foreman, and two forest rangers in Ust-Khairuzovo and by one woodsman in Kovran and Ust-Khairyuzovo.

In general, the state protection of natural objects within the Ramsar site, as in the whole territory of KAO, is unsatisfactory. Inspectors of Koryakekologia do not have transport, communication means, and other necessary equipment. The major cause of this is financial deficit.

[go to file 6 of 6]

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Ramsar site management plans -- Russian Federation, Karaginsky Island (file 6)

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K A R A G I N S K Y I S L A N D

"KARAGINSKY ISLAND" RAMSAR SITE

(file 6 of 6)

2. EVALUATION OF RAMSAR SITE

The estimation and determination of top priorities for elaboration of Management plan for Ramsar site become possible based on the collected comprehensive information.

2.1. Complex (cadastre) evaluation of animal resources for "Karaginsky Island" Ramsar site

311 vertebrate animals, including 119 bird species, 19 mammals, and 173 fish species, inhabit the Ramsar site "Karaginsky Island" (3128 sq. km). Thirteen species are rare and endangered.

The total number of major animal species ranges within 8.5 – 28.0 million individuals and evaluated at 57.7 – 67.6 million USD. The mean value of 1 sq. km of the site is 19,180 USD (Table).

Fish occupy the fist place by their ecological and economic importance. The number of salmons at the sea littoral reaches 4.0 million. Their value is high, but at present it is very difficult to determine their value correctly.

The second place belongs to birds. Their number on Karaginsky Island is 2.9 million; their value is 18.2 million USD.

The proportion of local and migratory bird populations is almost equal; passerines prevail among the local birds. Specific features of the ornithofauna are due to large colonies of sea birds – cormorants, gulls, auks, and shearwaters. There are aggregations of waterfowl and water-related birds here for moulting and wintering.

Betula ermanii forests, cliffs, and floodplain forests are important sites for breeding of birds, the coastal sea area – for migratory birds.

The third place is for mammals with mouse-like rodents as dominants (Clethrionomus and Sorex genera). The number of mammals ranges from 1.7 to 21 million individuals, their value from 0.5 to 6.4 million USD.

Pinnipedia animals (walrus, common seal, ringed seal, bearded seals, ribbon seal, eared seal) are significant in their total number (about 40,000).

The list of plants contains 307 species on Karaginsky Island.

Complex evaluation of animal resources in Kamchatka's Ramsar sites

Animal species and species	The number and value of animals in Ramsar sites	
groups	Karaginsky Island	
	Number (million)	Value (million USD)
Birds		
Residents	1,4	2,0
Migrants	1,3	3,7
Moulting, wintering	0,03	0,06
Rare and endangered	0,003	0,009
Total	**2,7**	**5,7**
Mammals		
Game mammals	0,001-0,004	0,01-0,04
Mouse-like rodents	1,7-21,3	0,5-6,4
Marine mammals	0,04	6,1
Total	**1,8-21,4**	**6,7-12,6**
Fish		
All species	4,1	38,5
Total	**8,5-28,1**	**50,8-56,7**

2.2. ECOLOGICAL RELATIONSHIPS

"Karaginsky Island" Ramsar site is an island with the adjacent shallow Bering Sea area. The complex topography of the island favours existence of various freshwater pools, rivers, lakes, bogs and coastal ecosystems.

The moderate temperature regime and high moisture stipulate low succession rates and the total high stability of natural ecosystems. The differences in temperature conditions of the spring-summer period from year to year cause regular distinct variations in the number of animals – migratory birds, small mammals, and other groups.

The key species affecting the site ecosystems are migratory waterfowl and water-related birds, colonial nesting sea birds, small mammals that are the most abundant animal groups supplying ecosystems with biogenic elements. Small mammals influence greatly the soil structure and fertility and are the main food for large mammalian species. The local bean goose (Anser fabalis serrirostris) population is considered as a species-indicator responding to changes in the site environment.

2.3. ESTIMATION OF SITE ECOLOGICAL TRAITS

Site area and location. A series of ecological traits provide an independent existence of the site. They are as follows: large length, breadth and total area with autonomous catchment; location of main river basins, low density of population and economic activities at the site and adjacent territories.

Biodiversity of the site is an important constituent of the global biodiversity. The site is a place of staying thousands of waterfowl and water-related birds during migration. The site is an area of breeding and moulting for bean goose (Anser fabalis serrirostris), mass spawning of salmons (especially rainbow trout) as well as of nesting for other specific sea birds.

Since the biodiversity and habitats of the site is at their natural state, the first required measures for managing the sites are protection against poachers and control of human economic activities to prevent transformation of the site habitats.

Naturalness. The site is a completely undisturbed natural area. The local antropogenic effect was registered only on the western coast.

Unique traits. The major spawning areas of the rainbow (steel-headed) trout are within the site. The site is one of the areas known on Kamchatka Peninsula as moulting areas for the bean goose Anser fabalis serrirostnis.

The low number of rare animal species in the site indicates their state within their range.

Vulnerabilities. The site is vulnerable only in relation to fires. The bean goose Anser fabalis serrirostnis population responds to some troubles. Potential threats for the site are pollution of the sea area with oil products, intensification of nature use (fishing) and recreation (tourism).

Typical nature. Ecosystems of Karaginsky Island are characteristic for other islands of the Bering Sea.

History of the site as a protected area. The Ramsar site (193,597 thousand ha) was organised in 1994 "Karaginsky Island".

The major actions for the management of the Ramsar site are conservation of natural ecosystems and prevention of habitats and biodiversity from degradation since the site is considered as a standard territory, refugium of unique biodiversity, life arena for local peoples of the North.

2.4. SOCIOECONOMIC ASSESSMENT

Aesthetic value of the site is determined by the natural state of Kamchatka landscapes. Rocky coasts with numerous bird rookeries are of particular value in this respect.

Role of the site in biosphere processes. The catchment within the site accumulates precipitation that is of great importance in developing the water budget of the region. Freshwater entering the littoral supports the salt budget of the sea, high productivity, and biodiversity of coastal ecosystems.

Social value of the site. The site is a life arena for the local not numerous peoples of the North supporting their traditional way of life (fishing, hunting, reindeer-raising).

Education. The site is of importance as a prospective region for ecological tourism (bird observation). The fish resources of the site attract all levels of the population.

The popularisation of ideas regarding the value of the site as a natural complex with high biodiversity and a life arena for indigenous peoples with their traditional way of life is of great importance in the educational work.

Recreation. When the site is used in recreation, a strict control over the number of tourists and organisation of routes in order not to trouble the most valuable natural objects (moulting grounds of bean goose, Anser fabalis, large nesting colonies, and etc.).

Research. The site is an interesting and well-suited place for studying bird ecology and migration as well as dynamics of wetland ecosystems.

The modern methods of collecting the field material allow getting data from any site plots.

2.5. CONFLICTS BETWEEN VALUES AND INTERESTS.

INVENTORY OF PROBLEMS

The internal and external causes responsible for negative impact on the site. The internal natural factors (plant succession, changes in hydrometeorological conditions) cause only weak fluctuations in qualitative and quantitative parameters of the site ecosystems. They show no evidence of negative trends. As noted above, the Ramsar site is an undisturbed natural complex.

Fishing (illegal, in particular) within the site is one of the anthropogenic factors affecting it. It is expressed as a trouble factor (motor boats on rivers, increase of people in fishing regions). Fires also influence negatively the site. Reindeer raising and winter fur hunting are poorly developed and do not affect the state of the site ecosystems.

The effects of natural factors beyond the site (outer factors) are unknown.

The oil production that is planned in the shelf adjacent to the site will pollute sea areas – places of staying birds in their migration and habitat of local bird populations. The scale of fishing and recreation are suggested to increase in the coming years.

Current legislation and factors related to existing traditions. According to the present legislation, the natural object is considered as a protected area (Ramsar site, zoological zakaznik) with limited regime of utilisation. From this viewpoint, to follow and control the regime declared is a necessary action to conserve the site as a natural object.

On the other hand, the status of limited using a site allows a prearranged economic load. The determination of this safe load is the second priority task of practical actions.

A future prospect of producing useful minerals at the adjacent territory arises the third task – improvement of the normative-legal base or creation of new one and control over its implementation. Only such complex of measures will provide the conservation of the Ramsar site.

Conditions affecting achievement of long-term goals. These conditions are related extremely to development of the regional economy. At the present stage of exploiting natural resources for raw materials the measures for conservation of the Ramsar site will be realised very slowly. With complex development of the economy, and wiser use of renewable resources (including fish resources) the performance of the actions planned will be more real.

Available means. The experienced staff to accomplish the tasks posed is absent. A small-scaled volume of the work (about 30% of the actions planned) may be completed by specialists of Koryakgoskomekologia and other nature conservation organisations as part of their duties. At the present time the necessary financing is absent.

3.GOALS AND TASKS

3.1. LONG-TERM GOALS OF MANAGEMENT

The Ramsar site is a vast territory undisturbed by human activity. The traditional land use in the northern regions is fishing, hunting, reindeer raising on limited scale. This human activity does not affect negatively the state of ecosystems. The status of the area as a Ramsar site including and partly zoological zakaznik favours the legal conservation of the site. Nevertheless, the traditional economic activity also needs control over fishing and struggle against poaching.

Since the production of hydrocarbon raw materials and useful minerals is planned on the shelf of the

adjacent territory, there is a danger of undesirable loads on the ecosystems. Timely preventive actions against them is one of the priorities of the present management plan for Kamchatka, a prospective region for various kinds of tourism. That is why the control of tourism is a very urgent task of the future.

A far distance of the Ramsar site from transport highways and weak control of nature use stipulates an action plan on creating a system of monitoring the state of natural ecosystems and anthropogenic impact.

The above permits to conclude that *the objectives of the Management plan for the site are as follows: to support the natural state of ecosystems and biodiversity through a complex of actions on optimisation of nature management, to improve protection and monitoring of the site status and ecological legislation, and to popularise ideas of conserving the site.*

Management of ecotopes and biodiversity of the Ramsar site is not topical.

3.2. DETERMINATION OF PRACTICAL ACTIONS

The real actions to support the natural state of the Ramsar site are represented as a complex of measures. The necessity and realisation of these actions are substantiated through analysing the problem including existing contradictions. The required actions are defined concretely in the Action plan resented.

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4. ACTION PLAN / INSTRUCTIONS

4.1. OPERATING PLAN

The analysis given in the previous chapter has revealed major tasks and actions on the conservation of the Ramsar site; they may be united in a brief Management plan. These actions are substantiated for 6 years as a complex of the measures described below.

4.1.1. SYSTEM OF MONITORING BIOLOGICAL DIVERSITY AND ANTHROPOGENIC IMPACT

SYSTEM OF MONITORING BIOLOGICAL DIVERSITY AND ANTHROPOGENIC LOADS

BASES AND APPROACHES TO ESTABLISHING MONITORING SYSTEM OF RAMSAR WETLANDS ON KAMCHATKA PENINSULA

Despite the numerous facts in the report submitted, the data on the abundance of wildlife on Karaginsky island are incomplete and display the situation of the 1970s - early 1980s. The counting of goose-like birds for the spring migration was conducted in the site only in 1975-1983 (Gerasimov, 1977; Gerasimov, Gerasimov, 1995), and the number of sea colonial birds is dated by 1969-1970 (Gerasimov, 1986).

Organisation of a monitoring system for the Ramsar wetlands of Kamchatka should be based on the current legislation.

The first principal document is the Decree of the Russian Government ? 1342, November 10, 1996 “On the procedure of records, state cadastre, and state monitoring of fauna objects”. According to this document, the appropriate offices carry out works on federal and regional monitoring. So, the State Committee of RF on Fishery (hereafter, regional structures) realises monitoring of fish and sea mammals, the Federal Department on Protection and Regional Use of Game Resources – of game animals, the State Committee of RF on Nature Protection (Goskomekologia of RF) and its regional department Koryakekologia – of nongame, rare, and extinct animal and plant species. The general co-ordination of works and data storage is rest on Goskomekologia of RF and Koryakgoskomekologia (Koryakekologia) as its regional structure.

The second basic document, the Law "On Environmental Protection" concerns the monitoring of anthropogenic environmental pollution that is controlled by the RF Goskomekologia. At the present time

the United State System of Ecological Monitoring of Russia (USSEM) is being elaborated as a development of the mentioned law.

Several systems of the state monitoring are known within the USSEM. They include monitoring of wildlife (fauna and flora) status and water bodies with respect to their pollution (Strategy…1999).

The existing system of wildlife monitoring is considered unsatisfactory because of the lack of subjects for investigation and necessary sampling. This is also directly related to the financial crisis in the country.

The incorporation of the Ramsar sites into the USSEM is recognised a problem of the future (Strategy…,1999). The integration of the wildlife monitoring and that of water quality is planned. In the context of the mentioned above, a problem of creating a system of monitoring of the Kamchatka and northern Koryakian Ramsar wetlands should be solved as an independent local procedure based on federal principles**.**

The current organisation and technical potentialities of realising the monitoring of Kamchatka wetlands are limited. Each wetland has by one inspector who is not obliged to conduct even simple natural observations.

Since the Ramsar wetlands are well off the settlements and main roads, there are many organisation problems in the monitoring.

Finally, considerable funds are needed for monitoring that are absent at present.

The following propositions and recommendations should be taken into account in organising a system of monitoring:

1. The number of objects for monitoring (environmental components and anthropogenic loads) should reflect properly the changes in the wetland.
2. Monitoring should be planned in two variants – for the present time and the future taking into account an improvement of social and economic situation.
3. Provision of a representative network of observation points for monitoring.
4. Elaboration of methods for monitoring including data storage (as computer database).
5. Specially protected areas (zoological zakazniks) should be the basis of monitoring.
6. Obligatory delivery of the necessary information (fish and game catch, building within wetland, used equipment and others) to Koryakekologia by nature managers.
7. Elaboration of a legal proposition on the obligatory delivery of the information about the number of animals and their use (fish, game mammals) to Koryakekologia on the basis of the Decree of the RF Government ? 1342, November 10, 1996.
8. Elaboration of a mechanism to get a mandatory permission for research expeditions within Ramsar wetlands and delivery of their results to Koryakekologia
9. Use of wetland maps and database compiled within the framework of the project.

In elaborating the monitoring it should be appreciated that this work starts with zero since a similar work was not conducted before.

MONITORING SYSTEM FOR NEXT 3-5 YEARS. STAGE 1

In the context of the present wetland condition, the most priority types of monitoring for the nest 3-5 years are as follows:

1. ***Counting of waterfowl in moulting and postbreeding periods***. The standard methods of the counting are given in Appendix of the project. The count is carried out by expeditions of some institutes (for instance, the Kamchatka Institute of Ecology and Nature Management -KIENM) only by orders of Koryakekologia based on economic agreements. The count frequency is once in every 3 years.

2. ***Counting of migrating fish to spawn and their catch*** is supposed to be conducted within the framework of the monitoring that is realised by regional service on protection and reproduction of fish resources. Koryakekologia should appeal to the appropriate authorities for getting necessary data and incorporation of the Ramsar sites into the system of monitoring.

The counting of fish catch should be improved by increasing requirements to reporting of the organisations that get permissions and licenses for fish or game.

A special form of reports is elaborated for the unified system of sampling materials.

An inspector for fish resources (in a particular wetland) should draw a conclusion on the reliability of the information about legal and illegal fish catch presented by fishery organisations. The interval for counting migratory fish is not less than once in every 3 years, that of catch is annually.

3. ***Registration of changes in landscape status.*** A periodic decoding of satellite photographs (space images) confined to late summer should be made. The space photographs are ordered in a federal division of the "Gostsentrpriroda". The decoding of environmental parameters (for instance, parameters of the plant cover) and assessment of changes in the environment are implemented by order of scientific organisations. Period for sampling is from 3 to 5 years depending on trends in economic activities within the wetland.

4. ***Registration of nature users' activities***. Any kind of nature management is tracked and the data on human activities are provided, including people's population, the numbers of cattle, technique, and other information on the impact on wetland. Sampling is every 2 years.

5. ***Registration of environmental pollution in emergency***, any kinds of accidents, and other anthropogenic impact. Reports are submitted in arbitrary form.

6. ***Counting of game mammals in winter period***. Special count routes in Ramsar wetland counting (where it is possible) should be organised within the framework of the annual state winter route (ASWR) by agreement with the Game Department of KAO. It is necessary to provide original data of counts to Koryakekologia. The counting frequency is every 1 or 2 years according to the ASWR standard methods.

7. ***Registration of meetings with rare and threatened with extinction animals***. This work is planned along with any research and visits of scientists, inspectors, naturalists, and others. The objects are Northern Goshowk, White-tailed Eagle, and others. The materials are submitted in arbitrary form or according to the accepted standards (see Appendix).

MONITORING SYSTEM FOR THE FOLLOWING 6 -10 YEARS. STAGE 2

The monitoring of natural and anthropogenic objects suggested for the first stage is performed and developed in the following issues:

1. Monitoring of water quality. The Koryakekologia should develop ASWR and include the coastal water area and inland water bodies of the Kamchatka Ramsar wetlands into the territory observed.

2. Counting of waterfowl in periods of spring and autumn migration is carried out according to the standard methods that propose the possibly high frequency (Appendix). The counts are performed according to economic agreements with participation of specialists from zakazniks and the reserve.

3. Counting of colonial birds and birds of terrestrial habitats. These two kinds of account are performed by the standard methods (Appendix) by order once in every 3 years.

4. Counting of sea mammals is conducted by economic agreements once in every 3 years.

SPECIFICATION OF SOME PROBLEMS OF MONITORING IN THE RAMSAR SITE

Counting of waterfowl in spring migration should be performed from May 1 to June 1 from an observation point in Yagodnoe. Observations last for 9 hours according to the accepted methods (Appendix).

Route counting of nesting birds in major habitats should be carried out in the Mamikinvayam from June 15 to July 5 in the following habitat types:

a. woodless tundra;
b. plain with lakes and thinned Pinus pumila elfin woods;
c. river floodplain.

A method of counting transects is used. The total (summarised) length of the route composed of separate sections should be not less than 10 km in each habitat.

Counting of sea colonial birds in nesting period is realised from a motor boat along the eastern island coast.

Counting of sea mammals is made by special methods.

Special suggestions for fish monitoring

A need to encompass various habitats and river basins as well as to monitor the fish diversity stipulates the following observation points:

1. Lake at Severozapadnyi Cape;
2. Inlet of Lozhnykh Vestei;
3. The lower Mimikinvayam River;
4. The upper Mimikinvayam River;
5. Ptichii Island coast.

The count frequency is once in a year, in fattening period. Equipment for fishing – nets, beach seine, fries seine, and fry traps.

LIST OF METHODS FOR MONITORING NATURAL OBJECTS AND ANTHROPOGENIC IMPACTS IN KAMCHATKA RAMSAR SITES

1. Methods for count of waterfowl after breeding and moulting periods.
2. Instructions for count of waterfowl in period of spring passage.
3. Methodical recommendations for route count of birds in terrestrial habitats.
4. Recommendations for count of rare birds of prey.
5. Recommendations for count of colonial nesting birds.
6. Winter route counts (WRC) of mammals.

MONITORING OF ANTHROPOGENIC IMPACT

Based on the available information about anthropogenic influence on the site ecosystems (current and potential), the following set of parameters for the control over anthropogenic impact is suggested for the next 2-3 years:

- registration of the number of fishers, the fish catch and of other land users;
- registration of pollutant discharges resulted from accidents, especially in oil production on the sea shelf, and in fires.

Table 16: Measures on organisation of monitoring system in the Ramsar site

?	Measure	Time of	Executors	Cost,USD	Financing source

		performance		(thousands)	
1	Elaboration of methods and gathering of information about nature users of the site (material and technical state and activity). The current control of land users' activity.	2001-2005	Koryakgoskomekologia, Koryakrybvod, Game Department of the KAA	2,0*	Federal budget
2	Registration of environmental pollution in emergencies.	Permanent	Koryakgoskomekologia		Federal budget
3	Monitoring of water quality by USSEM	2005	Federation of USSEM service	15,0*	Federal budget
4	Count of waterfowl at the end of breeding and moulting periods	2003 ?.	Koryakgoskomekologia, Game Department of the KAA	7,0	Sponsors, Ecological Fund
5	Count of migratory fish to spawn and their catch	2002 – 2003	Koryakrybvod	12,0	Federal budget
6	Count of game mammals in winter (winter route counts)	Permanent	Game Department of the KAA	5,0	Federal budget
7	Registration of meeting with rare and disappearing (threatened and endangered) animals	Permanent	Koryakgoskomekologia, other nature protection services	1,5	Federal budget
8	Count of waterfowl for spring and autumn migrations	2006	Koryakgoskomekologia, Game Departtment of the KAA	7,0	Ecological Fund, sponsors
9	Count of birds of terrestrial habitat and inventory of colonial nesting birds	2002- 2006	Koryakgoskomekologia	10,0	Ecological Fund, sponsors
10	Count of sea mammals	2006	Koryakgoskomekologia, Fishing control	12,0	Ecological Fund, sponsors
11	Registration of alterations in the state of landscapes	2002-2006	Koryakgoskomekologia	7,0	Ecological Fund, sponsors
12	Comprehensive inventory of site biodiversity	2004	Koryakgoskomekologia	25,0	Ecological Fund, sponsors
13	*Organisation of works on assessment of water quality**	2	Koryakgoskomekologia	10,0*	Ecological Fund, sponsors
14	Organisation of a station on studies of waterfowl	2003	Koryakgoskomekologia	10,0	Ecological Fund, other extra-budgetary allocations
Total costs				**131.55**	

4.1.2. OPTIMISATION OF NATURE MANAGEMENT

The normative-legal base of the Russian Federation provides some obligatory conditions (maintenance of quotas, terms and methods of production, and record keeping) when natural resources are transferred into use to enterprises or physical persons. These obligations are fixed by special agreements or operating licenses. At the present time, the terms and conditions of a contract (licence) are usually of general character, and control over their implement is insufficient.

State nature protection institutes have their own obligations – protection of resources against illegal production and other negative actions, monitoring, and regulation of utilising the natural resources. This system is far from ideal.

Taking into account the above, the conservation and rational utilisation of Ramsar sites in Kamchatka region should develop by improving the activity of both state nature protection institutes and nature users.

According to the Decree on Ramsar sites of the KAA, Statements on Zoological Zakaznik and Territory of

Traditional Nature Management, the economic activity in this region should be safe for ecosystems that are to have definite limitations. Particular or some specific limitations should be established by agreements (licences) between the state and enterprises – users of natural resources (fishing, game, future tourism, and etc.).

The actions mentioned above is supposed to be realised if Koryakgoskomekologia appeals to the Area Administration with a documentation to complete the existing treaty commitments (or to elaborate new ones) for nature users with their following approval and control over the implement. These actions and some other procedures should be defined concretely for each kind of nature management:

Fishery (responsible executor – the Koryak Area Committee on Fish Resources Protection – Koryakrybvod).

Improvement of terms and conditions of contracts (licences) for fishery enterprises:

- observance of limits, terms, ways and areas of fishing, sanitary- ecological conditions in fish processing;
- presentation of objective and timely information on the catch;
- tax payments to the budget and Ecological Fund.

Control over fishery enterprises:

- current (operative) work control;
- periodic control over rational use of fish resources and observance of requirements for wetlands conservation (certification).
- Organisation of monitoring spawning fish populations (in some cases, local populations) and fish catch.
- Coordination of the Koryakrybvod and Koryakgoskomecologia activities and presentation of information about the current state of fish populations in the Ramsar sites.

Improvement of a system on protection of fish resources:

- increase of staff and technical equipment

***Game* (*responsible executor is the Koryak Game Department*)**

- Acceleration of transferring game areas to hunters;

Improvement of agreement (licence) conditions on game management by hunt (game) users:

- game management;
- collection and presentation of reliable data on the number of animals and hunters yield;
- fulfilment of requirements for organising game tours for foreigners;
- effective protection of sites;
- tax payments to the budget and Ecological Fund.

Control of game users' activity:

- current (operative) control;
- periodic estimates of game activity of enterprises (certification);
- Improvement of counting the number and hunt of game animals.
- Coordination of interactions between the Game Department and Koryakgoskkomekologia. The latter should present the information gained about the number of game animals and their use in Ramsar sites.

6. Improvement of a system on protection of game resources:

- increase of staff and technical equipment.

Ecological tourism* (*(responsible executor is Koryakgoskomekologia)

1. Attraction of appropriate companies for organisation of ecological tourism.

2. Elaboration of requirements for recreation load, the order of visiting objects of high value, and creation of service infrastructure.

3. Elaboration of a procedure for tax payments to the Ecological Fund.

4.1.3. ELABORATION OF ECONOMIC MECHANISMS FOR NATURE MANAGEMENT CONTROL AND BIODIVERSITY CONSERVATION

The elaboration and realisation of economic mechanisms for conserving the biodiversity is one of the topical tasks of the Management plan for the Ramsar sites.

The management plans developed for the Ramsar wetlands are designed for the following 3-4 years, since under unstable economic situation in Russia, planning of specific treatments for the prolonged time is not to the purpose.

When developing the management plan, one of the main goals was to elaborate and realize economic mechanisms of conserving biodiversity in the wetlands.

This problem can be solved by introducing a rental payment for the territory's users, i.e. payment for the use of land and water with their biological resources. Such an approach would allow public authorities to introduce a differentiated system of payments: sparing payments for industrial branches applying processes and technologies that cause minimum damage to biological diversity, and vice versa. The system of rental payments should create the conditions, so that it would be unprofitable for the territory's users to develop those spheres of production that cause a serious damage to biodiversity.

In addition to such rental payments, users' compensation for the damage caused to wildlife and flora resources must be provided for. To the end, regulatory and methodological bases are required to assess the damage caused to biological diversity by different types of economic activity, in its most diversified manifestation - from local illegal destruction of plants and animals to cardinal environmental changes while constructing large economic facilities.

In 1997, a creative team of scientists from the Center for Study of Eurasian Migratory Animals including Professor V.E.Flint, Professor V.G.Krivenko, V.I.Pererva, Ph.D. (Biol.), V.O.Avdanin, Ph.D. (Biol.), and O.E.Medvedeva, Ph.D. (Economy) developed "Methodology for evaluating damage from destruction of wildlife species and from degradation of their habitat". This methodology, among others, was submitted to the competition held by the State Committee for Environment of the Russian Federation and was recognized the best one in terms of its concept and compliance with regulatory documents. Today the procedure of the methodology's authorization as a federal normative document to be used by environmental and local authorities as an instrument for prevention or reimbursement of relevant damage is in progress.

The methodology is based on the following initial data:

1. Defining natural (environmental) damage as a sum of two indicators:

    a. reduction in the number (i.e. count of reproductive part of population);
    b. and reduction in annual growth of population (productivity). These data are not regarded as just resource characteristics, but rather as integral indices of habitat condition.

2. Cost estimate of natural (ecological) damage.

The methodology includes the following parameters and calculation procedures:

- Assessment of the wildlife condition implies a resource (cadaster) evaluation including determination of the account and productivity of each animal species for the particular territory assessed.
- Identification of the affected territory and classification of zones according to the intensity of anthropogenic impact.
- Identification of actions : one-time or long-term, with indication of stages (facility designing, building, putting into operation, etc.)
- Assessment of changes in the wildlife condition as a result of anthropogenic effects: identifying the extent of reduction in the basic number and productivity of animals with reference to the initial state using special developed anthropogenic effect "response factors"; with the availability of necessary information, another assessment method can be used, namely: comparison of the territory evaluated with reference of similar landscapes.
- Procedure and options for natural (environmental) damage assessment. For each animal species, natural damage is defined as a sum of one-time loss in basic number and productivity magnitudes for the whole period of action's duration. The calculation procedure provides for three optional situations: direct assessment of the actual damage, planned action, long-term damage incurred.
- Damage to biological diversity is calculated as a special damage using Simpson's procedure of specific diversity index comparison prior to beginning of the action and at each stage of the action.
- Value of wildlife objects is defined in compliance with the current regulatory documents, namely: "Scale of civil actions brought against organizations and individuals for damage to the federal hunting fund" and the approved by the RF Government rates fixed for damages caused by legal entities and naturals persons through unauthorized shooting or destruction of animals.
- Cost estimate of natural (environmental) damage is animal group-specific.

For economically unused terrestrial invertebrates, including rare and disappearing species, cost of damage is equivalent to loss in basic number and annual growth multiplied by wildlife object value and specific "increasing rates" taking into account the status of the species' rarity, genetic importance, representation in the world fauna, importance.

For economically used animals cost of damage is calculated as a sum of two magnitudes: cost estimate of damage and lost benefit obtained using indicators of cost estimates of hunting grounds computed by the revenue method; market prices on products obtained from objects of wildlife; rates of payment for using wildlife objects.

For terrestrial invertebrates, including rare and disappearing species, cost of damage is calculated through the approved by the RF Government penalty rates for damage from destruction or degradation of earth mantle established for different territories of the Russian Federation, and through biomass indices (kg/hectare) computed by Yu.I.Chernov (1975).

In calculating cost estimate of animal biodiversity loss, a total value of cost estimate of damage to initial complex of wildlife resources is taken as basic. Reduction in biodiversity by 1% is equivalent to damage amounting to 1% of the value of damage caused to all wildlife resources on the affected territory.

The amount of the total damage to wildlife objects and habitats is a sum of all damage cost values obtained for each animal species of the territory assessed and for degraded biodiversity.

The calculation principles and algorithms of this methodology are suitable for assessment of damage to non-forest vegetation resources as well.

By now, Goskomekologia of the RF has approved "Methods" as a state normative document.

The items of the "Methods" testify that the following information and actions are necessary to estimate damage to wildlife (or biodiversity) under anthropogenic impact on ecosystems of the Ramsar sites.

Preparation of a cadastre for flora and fauna of Ramsar sites. Collection of detailed information about the number of dominant animal species and inventory of their habitats (Krivenko et al., 1997). This information is approved by the Administration of KAA as initial data on the natural state of the Ramsar site ecosystems (ecological standards or norms). The work is performed by two stages.

The first stage. Generalisation of the information within the framework of the present project. Despite the incomplete data, this information is suitable for assessment of damage.

The second stage. Gathering of detailed information for 3-5 years according to the purposeful program "Inventory and cadastre evaluation of the Ramsar site **biodiversity".**

Approval of "Methods for evaluation (calculation) of damage from destruction of wildlife objects and their habitat". The KAA Administration has approved the "Methods" along with ecological standards for the Ramsar sites (point 1).

4.1.4. ACCOMPLISHMENT OF SOME CONTROL FUNCTIONS

Performance of monitoring according to the program elaborated.

Providing of control over fulfilment of ecological requirements in realising projects on production of hydrocarbon raw materials at the adjacent shelf and mineral ore on the catchment area 1) at the stage of feasibility study; 2) at the stage of developing deposits in their localities and over the whole Ramsar site) through a system of monitoring.

Assessment of impact on the environment is determined in comparison of the natural state characters before loads (ecological standards) and those after the anthropogenic effect (monitoring data).

Evaluation of ecological and economic damage. The damage is calculated according to the "Methods" given above.

4.1.5. DEVELOPMENT OF SYSTEM OF PROTECTED NATURAL AREAS LEGISLATIVE INITIATIVES

Division of power and obligations between regional authorities and the federal centre.

The rights and obligations of the Federal Centre and Russian subjects on the protection of wetlands of international importance are not defined concretely by the Decree of the RF Government (? 1050, September 13, 1994) on Ramsar sites. It would be very useful if the Administration of the Koryak Autonomous Area shows an initiative to solve this problem. The key initiatives are as follows: division of ownership rights on wetlands (sites), mechanism of interaction between the Centre and the subject of Russia, redistribution of the financial means obtaining by the Ramsar sites in favour of Russia.

At the present time an increase of the staff for Koryalgoskomekologia to provide satisfactory activity of the Ramsar sites is a topical problem for the Federal Centre.

ORGANISATION ARRANGEMENTS

Improvement of protection. The main actions are to strengthen the material and technical base (living accommodations, transport) and to increase the staff of inspectors for protection of fish and game resources and the entire Ramsar site. These measures are necessary not only for "Karaginsky Island", "Moroshechnaya River", "Utkholok Cape" sites, but also for the Koryakgoskomekologia" personnel. The latter is responsible for settling the problems set.

The strengthening of the material-technical basis, staff on protection and scientific personnel is especially actual at the Koryak State Reserve that is a component of the "Parapol'sky Dol" Ramsar site.

Establishment of new Ramsar sites in Kamchatka region. Four Ramsar sites on the Kamchatka

Peninsula are elements of the united natural system; therefore, their state to a greater extent depends on the total ecological situation in the region. From this standpoint, the authors of the project are interested in increasing the number of Ramsar sites in Kamchatka region (Wetlands of Russia, v.3, 2000). This task is a constituent part of the Management plan presented.

According to the feasibility study elaborated, twelve areas on the Kamchatka Peninsula should be declared as the wetlands of international, federal, and regional importance protected by the Ramsar Convention (Wetlands of Russia, v.3, 2000).

4.1.5. SEARCH FOR FINANCING SOURCES

Under the present economic depression in the country, the financing for implementing the management plan of monitoring the Ramsar sites is a complicated problem. Therefore, a search for financial means should be realised in different directions.

Substantiation of budget financing. The budget financial means for all nature conservation departments of the region are scanty. The possibilities of the Ecological Fund of the Korayk Autonomous Area are also very limited. This situation may be held for the next 4-5 years. Nevertheless, an attempt to get state financial means to conserve the Ramsar sites is one of the major actions of Koryakgoskomekologia.

Initiatives for advanced tax system. An initiative of Koryakgoskomekologia) is expedient to impose a local tax for large enterprises (foreign and national companies operating in the region. These enterprises get permissions and limits for fishing in the sea area adjacent to the site, some of them are planned to produce oil and mineral resources within the site catchment area.

Financial means resulted from estimates of damage to the fauna. A procedure should be elaborated to transfer the financial means as profit from damage estimates for solving problems of the Ramsar sites.

Search for off-budget means may be realised by the following ways:

- appeal to the State Committee on Affairs of the North Peoples and private companies (Koryakgeoldobycha, Lukoil, and etc.) for material aid to arrange the Ramsar sites as an area of traditional nature management;
- appeal to the Federal Ecological Fund;
- appeal to foreign sponsors (WWF, Russian Agency of WWF, Secretariat of the Ramsar Convention, Wetlands International).

4.1.7. EDUCATION AND POPULARISATION OF NATURE CONSERVATION IDEAS REGARING REGIONAL RAMSAR SITES

The popularisation of nature conservation ideas is rather inefficient on the background of financial depression in Russia. As public surveys show that more than three fourth of the population of our country are not expressed concern over the unfavourable environmental state (Martynov, 1999). The governmental policy directed to domination of the fuel and power complex (oil and gas production) in the economy does not also promote popularisation of the nature conservation ideas.

Despite the current situation, the popularisation of the nature conservation ideas and those of protecting the Kamchatka Ramsar sites should be remained as toppriority tasks. As the economy is normalised, the nature conservation problems will be of great importance again.

The major lines in education and popularisation of ideas concerning protection and rational use of the Ramsar sites are considered as follows:

- role of the Kamchatka wetlands in the preservation of natural equilibrium, biological resources, and biodiversity;
- obligations of Russia and nature protection institutes of the Koryak Autonomous Area under the

Ramsar Convention;
- Kamchatka Ramsar sites as a constituent part of the environment for life of indigenous peoples following the traditional way of life and economy;
- necessity of efficient protection of the Kamchatka Ramsar sites and ways of its realisation.

The materials of the present project and Strategy for Wetlands Conservation in the Russian Federation (Moscow, 1999) should be the basis for the above-mentioned work.

The methods for popularisation of nature protection ideas can be diverse: preparation and publication of an illustrated booklet for the Kamchatka Ramsar sites, articles in local press, radio and televised addresses, performance of the "World Day of Wetlands Conservation" (February 2). A work plan is given in Table 17.

Table 17: Measures for implementing the Management plan of the Ramsar site

?	Measure	Time of performance	Executors	Cost, USD	Financial resource
Optimisation of nature management					
1.	Development of requirements for fulfilment of the terms of contracts by nature users of sites	1	Koryakgoskomekologia, Koryakrybvod, Game Department, and etc.	2,0	Federal budget
2	Collection of information on nature users of sites	1	Koryakgoskomekologia	2,0	Federal budget Ecological Fund
3	Certification of enterprises as nature users of Ramsar sites	5	Koryakgoskomekologia	5,0	Federal budget
4	Game management and allotment of game sites to hunt users	3	Game Department	15,0	Federal budget
5	Improvement of limits for production of biological resources	3	Koryakgoskomekologia, Koryakrybvod, Game Department	1,5	Federal budget
Elaboration of economic mechanisms for control of nature management and protection of biodiversity					
6	Approval of "Methods of evaluating damage to the fauna" and resource data on animals of the Ramsar sites as normative legal documents by the KAA Administration	1	Koryakgoskomekologia	1,0	Federal budget
7	Control over elaboration and fulfilment of ecological requirements in development of mineral deposits	2	Koryakgoskomekologia	5,0	Federal budget
8	Inventory and cadastre estimates of biodiversity of the sites	4	Koryakgoskomekologia	30,0	Ecological Fund, sponsors
Development of a system of protected natural areas					
9	Realisation of legislative initiatives on improvement of the Ramsar site status	3	Koryakgoskomekologia	1,0	Federal budget, Ecological Fund
10	Division of authorities between local and federal organs.	2	Koryakgoskomekologia	0,5	Federal budget, Ecological Fund
11	Development of a system for wildlife protection	5	Koryakgoskomekologia, Koryakrybvod, Game Department		Federal budget, Ecological Fund, sponsors
12	Establishment of new Ramsar sites	4	Koryakgoskomekologia	10,0	Federal budget Ecological Fund, sponsors

Total	**73,0**	

4.1.8. ORGANISATION OF SCIENTIFIC RESEARCH

Taking into account specific features of biodiversity and problems on conservation of the Ramsar sites, the scientific research should develop by the lines given below.

Participation in the interregional program "Creation of a System for Waterfowl Monitoring and Protection in Russia".

The main actions according to the Program:

- conclusion of a contract for cooperation of interested institutes (organisations) of north-eastern Asian coastal regions;
- revision of the priority list of the birds under threat of extinction and of the birds, the number of which is reduced; elaboration of purposeful actions for species and their habitat conservation;
- monitoring of local and migratory birds of the wetland natural complex;
- identification of negative factors affecting the bird populations;
- elaboration of protective measures (legislation, protected natural areas, rational use, advanced training of specialists);
- preparation of a substantiated project on organising a station for counts and studies of migratory birds.

Preparation of a cadastre for flora and fauna of the Ramsar sites.

Inventory and cadastre estimation of the Ramsar sites biodiversity according to the V.G.Krivenko's methodology (1998).

The major measures of the Action plan are presented in Table 17.

4.2. YEARLY WORK PLAN

The highest and feasible priorities were singled out of the problems concerning "Karaginsky Island" Ramsar sites. A yearly work plan consisting of several items has been worked out on their basis.

4.2.1. PREPARATION AND APPROVAL OF NORMATIVE-LEGAL DOCUMENTS

1. ***Development of terms and conditions of agreements for nature users of the site.***

   Based on the analysis of existing documents on the order of nature management, the requirements for organising fishing, game and other kinds of activity are defined concretely, special forms of reporting (point 6.1.1 of the Action plan) are elaborated. These documents are approved by the Administration in accordance with the established procedure.

   Koryakgoskomekologia along with Korykrybvod and the Game Department perform the actions above. The necessary financing is 2,000 USD (for all 4 sites of Kamchatka).

   After approval the documents prepared become a normative-legal base for restriction of the nature managers' activities.

2. ***Preparation of a folder of documents for evaluating damage to the site ecosystems in the course of nature utilisation:***

a. **Resource data on animals of the Ramsar sites as normative indices**. The data on the animal resources given in the present project are systematised in tables (Microsoft Excel). The tables contain the data on population density (per 1 sq. km) of animal species after

breeding period by sites (or for the entire site area) and the total number of species. Text characteristics are accepted. The preface represents characteristics of the animal resources, an order of their application as ecological standards, which describe the state of sites before intense antropogenic impact.

b. **Methods of evaluating damage from destruction of animals and their habitat** are submitted to the KAA Administration as an original document approved by the Goskomekologia of Russia. This document is recommended not only for the Ramsar sites, but also for the whole Koryak Autonomous Area.

The "Methods" are being developed according to the recommendations given to use them over the whole territory of the region.

The necessary financing for this action is 8,000 USD (for all 4 Kamchatka Ramsar sites).

After approval of the documents (a, b) they become the normative-legal base for the Koryakgoskomekologia to assess damage to animals from mining operations of large companies and other negative effects.

4.2.2. ORGANISATION OF MONITORING RAMSAR SITES

Koryakgoskomekologia using existing technical and other means performs centralised control over development of mining operations, registration and evaluation of damage from pollutant emissions in emergencies.

Organisation of monitoring nature users' activity in the sites. The monitoring of the human activity in the sites is realised according to the requirements accepted (4.1.1).

The purpose is to gain annual unified information about kinds and volumes of economic activity in the territory of the Ramsar sites.

Koryakgoskomekologia coordinates the work with participation of Koryakrybvod, Game Department, and other organisations.

The necessary financing is 5,000 USD (for all 4 Ramsar sites).

Registration of changes in the state of landscapes. Compilation of a habitat map (inventory of habitats) based on materials of space survey and field observations. The results of the work are "a reference point" for monitoring changes in the state of the sites (Chapter 6, point 3).

Koryakgoskomekologia coordinates the work. The necessary financing is 10,000 USD.

4.2.3. SCIENTIFIC RESEARCH

Organisation of Annals of Wetland Nature (Letopis prirody), that is realised by the plan given in Chapter 4.

Inventory of biodiversity of the sites and elaboration of scientific grounds of their monitoring is performed according to the plan given in 4.1.3. (Preparation of a cadastre for fauna and flora of the Ramsar site").

For the first year the elaboration of scientific programs and their financial substantiation are planned as well as a search for financial means. Koryakgoskomekologia is responsible for this work.

4.2.4. PREPARATION OF FINANCIAL SUBSTANTIATION AND OTHER ACTIONS

Preparation of financial substantiation on realisation of actions for the second year according to the Management plan (organisation of water quality assessment, counting of game mammals in winter, registration of alterations in the landscape state, and etc.) Table 17.

Koryakgoskomekologia carries out the work at the cost of the means provided by the operating budget of this organisation.

For further information about the Ramsar Convention on Wetlands, please contact the **Ramsar Convention Bureau**, Rue Mauverney 28, CH-1196 Gland, Switzerland (tel +41 22 999 0170, fax +41 22 999 0169, e-mail ramsar@ramsar.org). Posted on this Web site, 13 May 2001, Dwight Peck, Ramsar.

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