Information Sheet on Ramsar Wetlands (RIS)

1. Date this sheet was completed: August 1,2002

2. Country, region: Republic of Belarus, Grodno Oblast, Shchuchyn District

3. Name of wetland: Kotra

4. Geographical coordinates: 54°00′ N, 24°30′ E

5. Elevation *(average and/or maximum and minimum)***:** 123 – 141 m above sea level. Average 127-135 m

6. Area *(ha)***:** 10,584 ha

7. Overview

The described site occupies the southern part of a bigger wooded wetland territory both in Belarus (the projected Kotra zakaznik) and in Lithuania (Ramsar site of Chapkeliay).

The natural associations are dominated by woods occupying 86.6% of the site's area. The forests are located on thoroughly saturated terrain. The relatively rare for the region hydromorphic black alder and white birch woods constitute 20.9% and 10.1% of the territory respectively. About 5% of the area is under open fen mires and transition bogs. Meadows concentrated mostly in the Kotra floodplain also cover nearly 5%. Thus, over 40% of the site's area is waterlogged. The Kotra River flows along the northern boundary of the site. The river's floodplain is heavily inundated, the riverbed is meandering forming numerous bayous, channels and tributaries. The high diversity of the natural conditions is favorable for many rare protected kinds of plants and animals including helobious types.

8. Wetland type: (please circle the applicable codes for wetland types as listed in Annex I)

Marine-coastal:	A	B	C	D	E	F	G	H	I	J	K	Zk (a)
Inland:	L	**M**	**N**	O	P	Q	R	Sp	Ss	**Tp**	**Ts**	
	U	Va	Vt	**W**	**Xf**	**Xp**	Y	Zg	Zk (b)			
Human-made:	1	2	3	**4**	5	6	7	8	**9**	Zk (c)		

Please now rank these wetland types by listing them from the most to the least dominant: Xf, Xp,Tp, Ts, U, M, N, W, 4, 9.

9. Ramsar criteria: *(please circle the criteria indices applicable to this site as listed in Annex II; see also point 12 below)*

1 2 **3** 4 5 6 7 8

Please specify the most significant criterion: 1

10. Map of site included? yes

11. Name and address of the compiler of this form

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12. Justification of the criteria selected under point 9

The site is of international importance because it meets the following criteria:

Criterion 1
The site is a particularly good example of a wetland typical of Northwest Belarus and Eastern Baltic region as a whole, and is represented by a single wooded wetland including oversaturated watershed forests, bogs, transition bogs, fen mires, inundated meadows and forests, creek valleys, network of overgrow forest channels. The site is the only virtually unused wooded wetland in Northwest Belarus. It lies across the Belarus-Lithuania border and is the part of a single very important Lithuanian Ramsar wetland – Capkeliu reserve.

Criterion 3
The site supports populations of plant and animal species important for maintaining the biological diversity of biogeographic region. The site contains the range of biological diversity (species, habitat types) occurring in north-west region of Belarus. Most important community of site according EEC Habitats Directive: 91D0 bog woodland, 91E0 alluvial forests, 9080 fennoscandian deciduous swamp woods, 3160 natural dystrophic lakes, 3260 water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation, 6530 fennoscandian wooded meadows, 7140 transition mire, 2330 inland dunes with open *Corynephorus* and *Agrostis* grasslands.
The Kotra site is the most important area for conservation of biological diversity of northwest region of Belarus. Due to variety of habitats the area supports wide assemblage of rare animal species and sustains significant amount of rare Belarusian Red-Data-Book-listed kinds of birds (12 species), mammals (2), amphibians (1), fish (1), insects (9), and plants (15).

13. General location

The site is located in Shchuchyn District of Grodno Oblast around the headwaters of the Kotra River (the Neman river basin) 30 kilometers to the north of Shchuchyn, and it is a transboundary wetland. The site is sometimes historically referred to as the Kotra Pushcha. The Kotra River is the natural northern border of the site with the Lithuanian reserve Capkeliu, to the east it borders on the political frontier of Lithuania, to the south it ends at the rimland of the wooded wetland, and to the west it is limited by quarterly swaths that form the border between the site and the wooded areas drained due to mass peat extraction. The site borders have been identified and duly described.

14. Physical features

Geology and geomorphology

The upper layer of the area's landscape belongs to the zone of fluvio-glacial accumulation of lake glaciation and is represented by two genetic types. To the west lies a washout plain with numerous aeolian deposits generally concentrated at the banks of the Kotra River with distinct radial orientation. They are connected with the loftiest sections of landscape. The true altitudes range here within 123 m along the Kotra's shore line until 127-135 m in the dunes (maximum 141 m). Fragments of a second bottom 50-100 m wide and 1-2 m deep can be observed along the Kotra. The floodplain has two levels. The flat 50 m wide bottom section

gradually rises to an upper level characterized by undulating form shaped up by rather small cavities and crests. The width of this particular floodplain section varies from 50 to 80 meters.

In the southeast it is adjacent to a section of fluvio-glacial plain characterized by excessive or temporarily excessive moistening. The relief is undulating due to corrugated forms and individual sub-latitudinal sandy knolls. The aria in question is virtually fully waterlogged and covered for the most part by an intricate network of drainage canals. The hypsometric measurements correspond to 127-130 m of true altitude with 2-3 m - maximum 5 m - of relative elevation.

Among the subdominant geomorphologic features there should be mentioned the numerous waterlogged flowing-out hollows of submeridional and marginal course, wind-eroded troughs, small eroded kames integrated into the dune formations, and the small lake troughs with recently accumulated peat.

Soil cover

The soil cover of the site in question is represented by sod-podsol automorphic, sod-podsol semi-hydromorphic and hydromorphic, cespitose hydromorphic, peat-gley and gleyish floodplain types. Soil layers form on different lithological substrata. Sod-podsol and peat-gley soils of diverse varieties are based on the sandy clay and peaty stratum. The sandstone of the central and more depressed area of the site gives birth to sod-podsol, little or semi-sodded gley and temporarily oversaturated soils with underlying sand. Peat-gley and peat soils of low and medium capacity develop in depressed locations on heavily decayed wood-sedge-grass and wood-sedge-moss peat layers with underlying fluvio-glacial sands or sporadically with underlying clay sand or loamy mass. The wetland soil formation is represented by all types with dominating fen and bog complexes. The capacity of the peat deposit does not exceed 20-30 cm. This is characteristic of this landscape's transition types. The fen formation complexes are specific of vast flat depressions and river valleys of the Skorbyanka and the Nevishi River. Sod-podsol soils with various podsol capacity, sandy soils based on coherent and loose sands alternating with loose or clay sand, automorphic and contact-gley semihydromorphic soils cover the well-drained mineral islands, dunes and hills of the fluvio-glacial plain. The meadow associations are based on medium-capacity sod-gley soils.

The landscape complexes of the potential Ramsar site Kotra are distinguished for their interesting and rare for Belarus biogeocenosis: considerable continental aeolian deposits neighboring on flat waterlogged valleys with sand islands, small river valleys, mosaic vegetation. The sustainable and well-developed natural territorial complexes are based on the ancient lithogenous foundation.

Hydrography and hydrology

The wooded wetland Kotra is located in the upper reaches of the Kotra River, and it is related to the Skidel-Ivye region of the western part of peat fen-mires belonging to the end-moraine landscape. The initial peat formation in the area dates back to the Mid-Holocene, the time of a warmer and more humid climate when shallow lakes and lowlands with underlying ground waters and water-resisting rocks were subject to intensive overgrowth.

The site proper is founded on a section of the fluvio-glacial lowland (southern and central parts), the Kotra and Skorbyanka floodplains, ravines, wind-eroded troughs, cavities, and furrows. The area is dominated by bogs and fen mires.

The bogs are concentrated in the central part of the site. They are covered mainly by pine or white birch forests and pine undergrowth. Black alder forests tend to grow on fen mires, white birch associations – on transition bogs. The open fen mires and transition bogs are located predominantly in river floodplains and are represented chiefly by sedge associations. Of special interest is Lake Goloye Boloto, which is overgrown and transition-type waterlogged, whose central section is treeless with water-covered pits and open waters surrounded by white-birch-moss-sedge associations.

The bog is fed chiefly on rainfall, but ground waters also play an important role here. The surface run-off of the wooded wetland is shed both in the western and northern directions.

The principal draining watercourse is the Kotra River. It flows along the Lithuanian border and thus blocks the potential Ramsar site in the north. The river is 122 km long from the springhead to the estuary, and 35 km within the boundaries of the site. The catchment area is 2,060 km^2. The annual flow rate in the estuary is 12.8 m^3/s. Until the place where the Nevishi meets the Kotra River the actual river valley is hardly defined with double-sided low, flat, heavily waterlogged floodplain 100 to 800 meters wide. The upstream is slightly meandering, whereas downstream is wildly looping forming extra channels, bayous, small but deep floodplain lakes. The river width during the mean water period is 10-20 m, the depth is 0.3-2.0 m. The river's flow is quite slow, hardly noticeable at the springhead, with the average speed of 0.2-0.3 m/s. The average speed increases during the spring flood (the Kotra outlet).

The Kotra River as a whole plays a crucial role in regulating the hydrological regime of the Belarus-Lithuania protected complex by draining the territory of both the Capkeliu reserve and the potential Ramsar site Kotra.

The left branch – the 23 km long Skorbyanka River (the Chernya) had been totally canalized (1968). The 15 km long Nizyanka River flowing along the eastern border of the site was canalized in 1976. The rivers of Putisko (canalized in 1964) and Nevisha flow to the south and the east of the site. The territory of the projected protected site is covered with numerous drainage canals built in 1964-1979 that disembogue into the above-mentioned rivers. Despite the fact that the canals are overgrown with trees, shrubs and grass, they are still draining the wetland.

Lake Kraskovo lies in the northeastern part of the site. It has acclivitous waterlogged disintegrating banks, peaty bottom with sapropel at the center.

Climate

The mean temperature in January is -5.4^0C, in July – $+17.9^0$C. The average annual rainfall equals 550 mm with 75% precipitating during the vegetative season. The vegetative season lasts for 196 days. The lasting snow cover is formed by the end of December and its maximum winter depth averages 29 cm. The climate is characterized as warm, moderately humid, favorable for growth and development of main forest-forming species and for shaping up the ecosystems of coniferous and mixed coniferous-broad-leaved forests.

15. Hydrological values

The potential Ramsar site Kotra plays important role in water regime regulation in Northwestern part of Belarus. Water regime of large Lithuanian – Belarusian complex of marshes depends on state of Kotra River that begins on the area of potential Ramsar site Kotra. One of hydrological features of Kotra River is that its waters flow in different directions and the river is situated on territories of two river basins simultaneously.

16. Ecological features

The total area of the potential Ramsar site Kotra equals 10,584 ha. The territory is ecologically divided into three ecotopes: forests, wetlands, and floodplain meadows.

Forests. Hylile vegetation is domineering in the site and occupies 9,163.1 ha. The typological diversity of the hylile biocenoses is represented by a wide range of taxons running the gamut from dry heather and lichen-moss pine forests to spiraea black alder forests and light pine growths in the bogs. There were totally identified 61 types of 19 hylile type groups of 10 forest formations. Intensive saturation is the characteristic feature for all the forests of the site. That explains the greater share of relatively rare for the region black alder and white birch forests. Aboriginal hylile types within the forest structure of the protected site account for 84.7% of the total area, which is very impressive for Belarus.

Wetlands and floodplain meadows occupy about 10% of the area, but greater portions of them are covered by hylile vegetation.

The Kotra River valley's vegetation is represented by a wide variety of wetland grasses (*Phragmitetea* genus), acidophilic associations of grass mires (*Scheuchzerio-Caricetea* genus), and wet meadow associations (*Molinio-Juncetea* genus). The greatest total areas are occupied by *Phragmitetum communis, Caricetum rostratae, Caricetum appropinquatae, Deschampsietum caespitosae*. Among the above-mentioned taxons the most interesting for phytocenology is *Caricetum appropinquatae* whose natural area in Belarus has been reduced dramatically due to the all-out drainage activities. Such unique fen associations as *Caricetum elatae, Caricetum limosae, Caricetum lasiocarpae* that survived in the hard-to-reach depressions of the Kotra River valley and floodplain are currently under the same threat. The inundated river valley is the natural eastern border of the area of uninterrupted distribution of *Caricetum elatae*. Here it is represented just by one subassociation – *Caricetum elatae equisetetosum fluviatili*. The dominants are accompanied by the species typical of fen-sedge associations: *Rhynchospora albal, Scheuchzeria palustris, Eriophorum vaginatum*.

The vast bogs, transition bogs, and semi-fens are covered with *pine scrub-sedge-grass-moss and scrub-white-birch-moss sub-taiga forests* represented by sedge-pine *Pinetum caricosum*, ledum-pine *Pinetum ledosum*, sedge-moss *Pinetum caricoso-sphagnosum*, river-grass *Pinetum fontinale-herbosum* and moss associations *Pinetum sphagnosum*. Forest stands with sporadic white-birch *Betula pubescens*, in the river-grass and sedge-pine forests – with Black Alder *Alnus glutinosa*, sometimes Aspen *Populus tremula* and Spruce *Picea abies*. The undergrowth is represented by Bog Bilberry *Vaccinium uliginosum* and Ledum *Ledum palustre*, sometimes by Willow *Salix sp*. The soil cover abounds in all kinds of sedges: *Carex limosa, Carex lasiocarpa, Carex acuta, Carex elongata*. The river-grass and sedge-moss pine forests often have in their lowest tier all kinds of bog grasses: *Menyanthes trifoliata*, *Comarum palustre*, *Scheuchzeria palustris*, *Chamaedaphne calyculata*, *Empetrum nigrum*, *Oxycoccus palustris.* The moss cover is also very representative (*Sphagnum magellanicum, Sphagnum girgensohnii, Sphagnum parvifolium, Sphagnum apiculatum*).

Black alder forests and white-birch-black-alder oversaturated forests cover the fen mires. This category is represented by sedge *Glutinosa-Alnetum caricosum*, marsh fern *Glutinosa-Alnetum thelypteridosum*, spiraea *Glutinosa-Alnetum filipendulosum,* fern *Glutinosa-Alnetum filicosum*, stub-wort *Glutinosa-Alnetum oxalidosum* and nettle black alder forests *Glutinosa-Alnetum urticosum*. Forest stands with sporadic White Birch *Betula pubescens*, sometimes Aspen *Populus tremula* and Spruce *Picea abies*, and even Oak *Quercus robur*. Well-developed undergrowth abounds in Willows *Salix sp*, Black Currant *Ribes nigrum*, Red Currant *Ribes spicatum*, and Red Raspberry *Rubus idaeus*. The vegetative soil cover is dominated by Sedges *Carex sp.*, *Thelypteris palustris*, *Urtica dioica*, *Filipendula ulmaria*, *Solanum dulcamara*, *Comarum palustre*, *Gallium palustris*, *Geum rivale*, *Caltha palustris*, *Calla palustris*, and other marsh grasses. White-birch and pine-white-birch forests developed in fen mires. Among them are *Betuletum polytrichosum*, *Betuletum fontinale-herbosum, Betuletum caricoso-sphagnosum*, *Betuletum caricosum*, *Betuletum caricisi-herbosum*, and *Betuletum thelipteridosum* associations. Forest stands are also composed of Black Alder *Alnus glutinosa*, Common Birch *Betula pendula*, Common Pine *Pinus sylvestris*, sometimes – Aspen *Populus tremula*. The light undergrowth is represented by Willow *Salix sp* and Alder Buckthorn *Frangula alnus*. The lowest tier abounds in Bilberry *Vaccinium myrtillus*, Sedges *Carex sp.*, Bog Bilberry *Vaccinium uliginosum*. The moss cover is based on *Polytrichum commune*, *Sphagnum magellanicum, Sphagnum recurvum, Sphagnum teres*.

The wetland forests are hard to reach, quite old with various-aged mixed forest stands, and they play an important environment-shaping role of sustaining water regime for the territory. They are also like hubs with great concentration of biota's hygrophilous components, habitats of a number of rare species of plants and animals.

17. Noteworthy flora

The research conducted on the territory of the potential Ramsar site Kotra registered existence of 633 kinds of higher vascular plants related to 345 genera and 91 families. Among them are 6 species of club moss, 6 horsetails, 9 ferns, 4 gymnosperms and 608 angiosperms, 23 kinds of trees, 38 kinds of shrubs and subshrubs, 572 kinds of grass and undershrubs.

15 species are listed in the National Red Data Book of Belarus – *Arnica montana*, *Coeloglossum viride*, *Dactylorhiza baltica*, *Dactylorhiza majalis, Dentaria bulbifera*, *Gladiolus imbricatus*, *Huperzia selago*, *Iris*

sibirica, *Lathyrus montanus*, *Lilium martagon*, *Listera ovata*, *Malaxis monophylla*, *Plathanthera chlorantha*, *Pulsatilla pratensis*, *Siella erecta*. Many of the above-mentioned species are specific of the Kotra wetland. Besides, the Kotra floodplain preserves some species that are about to be included in the new edition of the Red Data Book of Belarus for 2003-2004 – they are *Eleocharis quinqueflora*, *Salix lapponum*, *Betula humilis*, *Polemonium caeruleum*.

Seventeen species are included in the system of wise management. They are *Pulsatilla patens*, *Thalictrum aquilegifolium*, *Aquilegia vulgaris*, *Digitalis grandiflora*, *Campanula persicifolia* and *Campanula trachelium*, *Polygonatum multiflorum*, *Dactylorhiza fuchsii*, *Dactylorhiza maculata*, *Dactylorhiza incarnata*, *Epipactis palustris*, and others.

Among the plants found within the studied territory the following species could be of certain interest for florigenetics, floristics and chorology – *Diphasiastrum zeilleri*, *Diphasiastrum tristachyum*, *Ophioglossum vulgatum*, *Pulsatilla x wolfgangiana*, *Urtica galeopsifolia*, *Cerastium semidecandrum*.

The lichens are represented by 135 species and 7 subspecies. Five of them are rare: *Stenocybe mayor, Thelocarpon impressellum, Cetrelia olivetorum, Lobaria pulmonaria* and *Menegazzia terebrata.* The latter two are protected in Belarus.

18. Noteworthy fauna

The animal life of the potential Ramsar site Kotra is specific in many aspects, which is stipulated by heavy saturation of both Belarusian and the neighboring Lithuanian sides. Low anthropogenic load, bogs, mires, hard-to-reach intact waterlogged forests and dry patches create favorable conditions for existence of many kinds of animals. The proximity of Lithuanian protected sites, and of the Capkeliu Reserve in particular, also positively affects the development of animal population in the region.

The studied territory is known to have totally 156 vertebrates, 26 of which are mammals, 117 – birds, 5 – reptiles and 8 amphibian species.

Mammals

The mammals of the region include virtually all native ungulates: Moose *Alces alces*, Red Deer *Cervus elaphus*, Wild Boar *Sus scrofa*, Roe Deer *Capreolus capreolus*. Dry forests near mires are inhabited by the European Hare *Lepus europaeus*, ledum pine growths and transition bogs are nice habitats for the Alpine Hare *Lepus timidus*. Common predators are the Raccoon Dog *Nyctereutes procyonoides* and the Red Fox *Vulpes vulpes*; the Wolf *Canis lupus* is encountered much more rarely. The Badger *Meles meles* finds it fitful to burrow in dry patches and mire islands. The Kotra River along with the whole system of drainage canals are inhabited by European Beaver *Castor fiber* and Musk Beaver *Ondatra zibethica*. The weasel family consists of Common Marten *Martes martes*, Polecat *Mustela putorius*, American Mink *Mustela vison*, Least Weasel *Mustela nivalis*, Stoat *Mustela erminea*; the Otter *Lutra lutra* can sometimes be seen in the Kotra floodplain. Most mammals prefer rich and productive floodplain forests.

The Beaver has a considerable environment-shaping impact on the natural complexes of the wooded wetland. As of November 2000 there were registered 52 specimens of the species on the territory of the site. The Beaver inhabits virtually all permanent watercourses of the site thus radically transforming the surrounding landscape. First of all the transformations are caused by changes in the hydrological regime of the adjacent area, inundation of floodplain phytocenoses, reduction of run-off rate. Numerous beaver's habitations, weirs and lodges were found along the whole Kotra's midsection. The biggest weirs were sighted at the place where the Skorbyanka drains into the Kotra River. Here phytocenoses went through the greatest structural changes. The floodplain section inundated due to the increase of the river experienced a complete substitution of sedge-cereal associations for reed associations, numerous canals were dug out that became an integral part of the river's hydrological network. As a result of the trophic activities, the structure of arboreal and frutescent vegetation of floodplain phytocenoses has changed dramatically.

The projected Ramsar site Kotra is in the immediate vicinity of the Capkeliu reserve, which directly affects the populations of local mammals and especially the economically valuable species. These conservation sites

are one integral wooded wetland with intensive migration processes of mammals connected both with seasonal feeding or reproduction and with the hunting activities performed on the Belarusian side of the border. Moose *Alces alces*, Roe *Capreolus capreolus*, and Deer *Cervus elaphus* tend to concentrate on Belarusian tree-cutting areas during the fall-winter period. Calving also happens chiefly on the Belarusian territory. During the hunting season however the ungulates migrate to the Lithuanian side where hunting is prohibited.

Among the species listed in the National Red Data Book of Belarus there were registered only two – Lynx *Felis linx*, which is sometimes sighted here, and Badger *Meles meles*. Populations of protected species of bats are very likely here, but that particular taxonomic group has yet to be specifically studied.

The theriofauna of the potential Ramsar site includes such species as Wolf *Canis lupus*, Eurasian Otter *Lutra lutra,* Lynx *Felis lynx* that are listed in the European Red Data List of Plants and Animals.

Birds

The potential Ramsar site boasts 117 bird species, which is 39.3% of all the registered species encountered in Belarus.

The conducted field research of the site demonstrated that both composition and structure of the ornithological complex are fairly typical of coniferous and mixed forests of Northwest Belarus. The intensive inundation of the territory, rivers and drainage network in the forests naturally enhance the range of ornithological complex.

The site's area is heavily waterlogged, but after the drainage activities in the forests many moistened forests and wetlands have, to a large extent, degraded. Thus the water fowl complex is mainly concentrated in the Kotra floodplain. It is a nesting site for Common Snipe *Gallinago gallinago*, Corncrake *Crex crex* and Great Snipe *Galinago media*; commonly encountered species are Thrush Warbler *Acrocephalus arundinaceus* and Reed Warbler *Acrocephalus scirpaceus*, Nightingale *Luscinia luscinia*. Among the more rarely encountered are River Warbler *Locustella fluviatilis*, Sedge Warbler *Acrocephalus schoenobaenus* and Marsh Warbler *Acrocephalus palustris*. Coot *Fulica atra*, Rail *Rallus aquaticus,* Gallinule *Gallinula chloropus,* Mallard *Anas platyrhynchos*, Common Goldeneye *Bucephala clangula* can be found at saucer lakes, that are also a feeding site for Common Heron *Ardea cinerea* and White Stork *Ciconia ciconia.* The dense beaver population caused the appearance of natural permanently waterlogged areas, which are potentially ideal nesting sites for Crane *Grus grus*, Green Sandpiper *Tringa ochropus*, and some other water fowl.

Intensive woodiness of the site accounts for the domineering of hylile species. They make up for over a half of ornithological fauna of the projected protected site. The overwhelming majority of them are quite commonplace species. The older forests are inhabited by different kinds of woodpeckers – Wryneck *Jynx torquilla*, Black Woodpecker *Dryocopus martius*, Greater-Spotted Woodpecker *Dendrocopos major*, Lesser-Spotted Woodpecker *Dendrocopos minor.* The Three-Toed Woodpecker *Picoides tridactylus* and Green Woodpecker *Picus viridis* were repeatedly sighted in the northwest of the region. The described territory is characterized by adequate conditions for game-birds, which accounts for considerable populations of Hazel Hen *Bonasia bonasia*, Woodcock *Scolopax rusticola,* Ringdove *Columba palumbus*, some Black Grouse *Tetrao tetrix* and Capercaillie *Tetra urogallus.*

Among the protected species (as listed in the National Red Data Book, 1993) found in the Kotra site are Black Stork *Ciconia nigra*, Common Goldeneye *Bucephala clangula*, Crane *Grus grus*, Great Snipe *Gallinago media*, Lesser Spotted Eagle *Aquila pomarina*, Kestrel *Falco tinnunculus,* Hobby Falcon *Falco subbuteo,* Eagle Owl *Bubo bubo*, Tengmalm's Owl *Aegolius funereus*, Three-Toed Woodpecker *Picoides tridactylus*, Green Woodpecker *Picus viridis*, Great Gray Shrike *Lanius excubitor*. Bittern *Botaurus stellaris* is sighted at the outskirts of the wooded wetland (Bershty Lake).

International significance of the potential Ramsar site Kotra is manifested first of all in sustaining a number of endangered and rare species according to the criteria of the International Union for Conservation of Nature (IUCN). Most of the below-mentioned species were sighted nesting in the site (see Annex I).

Endangered species – Great Snipe *Gallinago media* and Corncrake *Crex crex*.

Rare species – Black Stork *Ciconia nigra*, Gray Goose *Anser anser*, Common Goldeneye *Bucephala clangula*, Montagu's Harrier *Circus pygargus*, Kestrel *Falco tinnunculus,* Hobby Falcon *Falco subbuteo,* Capercaillie *Tetrao urogallus*, Crane *Grus grus*, Wood Sandpiper *Tringa glareola*, Eagle Owl *Bubo bubo,* Tengmalm's Owl *Aegolius funereus*, Green Woodpecker *Picus viridis*, Great Gray Shrike *Lanius excubitor,* Spotted Nutcracker *Nucifraga caryocatactes*.

Amphibians and reptiles

The faunistic composition of amphibians and reptiles is represented by 13 species. The population is dominated by frogs (*Ranidae*), and Common Lizards *Lacerta vivipara* that are especially numerous in the isolated waterlogged areas and in the Kotra floodplain. Dry pine growths are common habitats for the Sand Lizard *Lacerta agilis* and Common Toad *Bufo bufo*; the Blind Worm *Anguis fragilis* inhabits young pine growths and overgrowing cutting grounds. Adders *Vipera berus* were sighted at the mires' outskirts. Grass Snake *Natrix natrix,* Fire-Bellied Toad *Bombina bombina*, and Frog Rana arvalis inhabit open inundated meadows in the Kotra floodplain.

Fishes

The ichthyofauna is generally characterized by ordinary river species (Pike *Esox lucius,* Bleak *Alburnus alburnus,* Breamflat *Blicca bjoerkna,* Roach *Rutilus rutilus,* Redeye *Scardinius erythrophthalmus,* Ling *Lota lota,* Ruff *Gymnocephalus cernuus,* Perch *Perca fluviatilis,* Id *Leuciscus idus*). Brook Trout *Salmo trutta trutta morpha fario* listed in the National Red Data Book of Belarus is sometimes spotted upstream of Bershty.

Insects

The entomofauna of the site includes 9 insect species listed in the National Red Data Book of Belarus – *Carabus nitens*, *Geotrupes vernalis*, *Papilio machaon*, *Apatura iris*, *Poliomatus optilete*, *Colias palaeno*, *Catocala fraxini*, *Bombus schrenckii*, *Calopteryx splendens*.

19. Social and cultural values

The area of the potential Ramsar site is historically sparsely populated. Furthermore, in the '60's in order to establish a new military testing ground on the territory of Belarus and Lithuania, villagers living in the southwest of the wooded area were displaced, their houses torn down. At the moment just few villages – Zubrovo, Ivache, Volchy Yamy – are still located within the boundaries of the potential Ramsar site. Their total population does not exceed 20-25 persons.

Currently within the projected conservation site there is a governmentally protected memorial site marking the place where in 1943 the Nazi soldiers burned down the whole Ogorodichi Village along with 147 local people. The memorial is situated 6 km to the northeast from Zubrovo Village on the right bank of the Kotra River. After the demarcation there is no driveway to the memorial as the only access road lies on the Lithuanian side of the border. From the Belarusian side it can be reached only by a footpath crossing the inundated Kotra floodplain. The memorial is maintained in order by local people and relatives of the deceased.

The archeological heritage of the area has not been thoroughly studied, there are no protected archeological sites there. However, on the left bank of the Kotra River in quarters 31 and 174 of the Novodvorskoye Forest District on the ancient aeolian dunes there were found two settlements dating back to the Stone and Bronze Ages. Not far from the villages of Motyli, Hanelki and Venzovshchina located at the outskirts of the potential Ramsar site, numerous medieval burial grounds were discovered.

Later, during designation of recreation zones and hiking trails, those historic spots should be included into the list of tourist attractions.

20. Land tenure/ownership

On the site

The grounds of the potential site are property of the state (belonging to the Shchuchyn district executive committee). The forests are leased for life to the Lida Forestry, meadows and agrocenoses – to the state farm "Znamya Sovetov" and the collective farm "Bershty" of the Shchuchyn district.

On the adjacent areas

State-owned lands leased by collective farms and forestries.

21. Current land use

On the site

Forests of the Kotra site are subject of various business applications by the Novodvorskoye and Pervomayskoye Forest Districts of the Lida Forestry. The total managed area equals 10,347 ha.

Non-wooded areas are used for grass-cutting (about 1.1% of the territory) and to a little extent for tillage (less than 0.1%). Local people use the Kotra floodplain upstream of Bershty for cattle grazing, and the midsection – for grass-cutting.

The hunting grounds of the projected conservation site are managed by the Shchuchyn district association of hunters. The forests are visited by local people for collection and storage of berries and mushrooms.

On the adjacent areas

The economic activities on the adjacent mostly drained areas are agriculture-oriented – cultivation of perennial grasses, plowable and cereal crops, cattle grazing. In the southwest the projected protected site borders on a drained peatland where peat extractions are performed.

22. Threats

On the site

Drainage activities – are the most important anthropogenic factor affecting the whole natural complex both on the Belarusian and Lithuanian sides.

Forest reclamation activities along with straightening and canalization of all the rivers (with the exception of the Kotra) were performed in 1968-1976. As a result, the ground water table dropped considerably, which invariably impacted the natural complexes of the Kotra River's left bank.

The main watercourse draining the territory of the site is the Kotra River. The research carried out in summers of 1998 and 1999 demonstrated degradation of the Kotra's riverbed before it meets with the Skorbyanka, the springhead proper was very dry. The worsening regime of water supply entailed changes in the structure of meadow-marsh vegetation and intensive encroachment of shrubs on floodplain meadows. The changes in hydrological regime led to the numerous overgrown closed lakes and bayous – the habitats of many water fowl and animals; degradation of fish breeding grounds with dramatic decrease in population of most fish species.

The drainage activities are the main threat to the existence of all sedge associations (*Caricetum elatae, Caricetum limosae, Caricetum lasiocarpae, Caricetum juncellae, Caricetum appropinquatae, Caricetum echinatae*) and nymphaea associations (*Nymphaea tetragona*) of the Kotra floodplain. The *Caricetum limosae* association faces the greatest threat. The changes in hydrological soil regime results in substitution

of mud sedge *Carex limosa* for environmentally more mobile and wide-spread species and shrubs, which could lead to irredeemable disappearance of unique marsh associations. The natural encroachment of shrubs and forests poses a serious threat to such associations as *Sieglingietum decumbentis* and *Corynephoretum canescentis*.

Fires. The considerable share of dry pine forests in the hylile composition of the site enhanced by temporary deficit of moisture in summer months account for relatively high fire hazard. The fire threat is especially acute for the northern, western, and to some extent southwestern sections of the site. If the open drained worked-out peatland bordering in the southwest on the Kotra site ignites during summer time, successful fire extinction would be highly improbable, which was graphically proven during droughts of 1999 and 2000.

Encroachment of shrubs. The reduction of ground water table results in encroachment of shrubs on the Kotra floodplain. Rare grasses are extruded by more flexible shrubs, there is noticeable reduction in biological diversity of meadows and capacity of hayfields.

Uncontrolled excessive grazing plagues the Kotra section from Ivache to Podbershty Village. Here excessive grazing led to degradation of grasses, synanthropization and vulgarization of vegetation composition.

Poaching. The activity results in declined number of main huntable animals (Moose, Deer, Wild Boar) whose population is significantly below the biological capacity of the site. The current situation with the local population of Moose, Capercaillie and Black Grouse arouse particular concern, the same goes for the micro-populations of nationally protected species of Lynx and Badger.

Wood cutting. The greatest harm done to the natural complexes of the projected zakaznik in connection with excessive wood cutting falls on the ‘60’s and ‘70’s. The forests in the southwestern part of the site suffered the most, and now they are made almost exclusively of new tree plantations. The traditional all-out felling of trees on vast areas entails dramatic reductions in biological diversity, and changes in the structure of phytocenoses and zoocenoses.

On the adjacent areas

Drainage activities on the site date back to 1964-1979. As a result, virtually all major wetlands in the adjacent areas were drained, riverbeds were straightened and canalized. Practically all unwooded lands lying to the south of the projected conservation site were at one time or another subjected to drainage activities of various intensity.

Peat extraction on the adjacent southwestern wooded area (Novodvorskoye Forest District, quarters 213 and 214 totally, quarters 192, 193, 194 partially) had an adverse effect on the potential Ramsar site. Currently another area is used to the same end (quarters 193 and 169 totally, quarters 170 and 194 partially). The drainage required for peat extraction resulted in vegetation xerophytization around the extraction site, and appearance of drainage-derivative associations.

To resolve the current situation, it seems advisable to suspend the extraction activities (the forest district has recently received back the worked-out peatland in quarter 214) and reinundate the area in view of subsequent gradual restoration of endemic wetland ecosystems.

Unwise use of floodplain and drained lands for agricultural purposes, including tillage, continuous grassing, premature grass-cutting, intensive grazing, results in degradation of floodplain associations and washout of organic substances into the Skorbyanka and the Kotra River polluting and sliming them eventually.

23. Conservation measures taken

There have been prepared by now the scientific rationale and feasibility study for establishment of landscape zakaznik Kotra on the territory of the site. All the materials included in the rationale along with the land-use regimes were coordinated and approved with land-owners, land-users, and other stakeholders, and then submitted to the Ministry of Natural Resources and Environmental Protection. In 2002 the Ministry of

Natural Resources and Environmental Protection included the area into the list of potential Ramsar sites of international importance.

In accordance with the project "Provisions For the National Landscape Zakaznik Kotra", the following activities are prohibited on the territory of the zakaznik:

- activities that could disrupt the operation of principal natural ecosystems, change the historical landscape outline, damage the structure of the most valuable vegetation associations or affect the habitats of protected animal and plant species;
- tillage except for the specifically designated areas;
- application of pesticides;
- permanent tourist settlements (except for the specifically designated and equipped areas) or establishment of recreation zones in the most valuable places of the zakaznik;
- drainage activities (except for maintenance of the existing forest reclamation facilities), transformation of natural water channels into utility water-lines, discharge of communal liquid or hard wastes into rivers or lakes, drawing water from the channels for utility needs (except for fire-fighting purposes);
- grazing of any cattle with the exception of cattle belonging to local people residing within the zakaznik;
- regrassing of meadows (soil cultivation with subsequent introduction of fertilizers and seeds);
- cutting of old, hollow, solitary and canopy-dominating trees located by woodsides, glades, clearings, etc. for the ultimate purpose of preserving habitats of rare bird and animal species.

The forestry regime on the territory of the Kotra Zakaznik has certain limitations:

- selective, gradual, and narrow all-out cuttings (with the cutting width below 50m for coniferous and 100m for small-leaved tree stands) are allowed on the whole zakaznik's territory in pine, spruce, birch, black alder and aspen forests (with the exception of especially valuable spots) as long as the cutting is conducted in compliance with the current regulations;
- any cuttings including sanitary or waste management cuttings of especially valuable growths of Oak, Ash, Maple, Spruce, Pine, Aspen, Birch or Black Alder trees are strictly prohibited;
- all-out or gradual cuttings of growths containing solitary ancient English Oak, valuable birch or black alder forests, as well as tree stands located on the dune-hummock ridges of the Kotra floodplain are strictly prohibited;
- waste management is prohibited for all categories of valuable spots with the exception of the 50-meter strips along the utility or general-use roads;
- the current management regime must be preserved on the especially valuable wetlands, while the intensity of cattle grazing should stay the same (same cattle, same grazing duration), and no peat or moss collection by local people and no collection of berries for sale must be allowed either;
- construction of buildings, facilities, power lines, roads, pipelines and other public utilities, or development of mineral resources on the zakaznik's territory are implemented in compliance with the laws of Belarus and after coordination with the Ministry of Natural Resources and Environmental Protection of the Republic of Belarus and the Ministry of Architecture and Construction of the Republic of Belarus;
- the regime of the National Landscape Zakaznik Kotra must be taken into consideration during elaboration of Shchuchyn district land management schemes, Lida Forest District management projects, and urban development projects;
- enunciation of the National Zakaznik shall not entail expropriation of zakaznik territories from the current land-owners and land-users;
- land-owners and land-users whose lots are located on the newly-established National Landscape Zakaznik Kotra shall be obliged to observe the zakaznik regime and apply only environmentally-friendly technologies;
- the National Landscape Zakaznik Kotra is managed by the Shchuchyn district executive committee that together with other conservation authorities shall provide proper security for the site;
- the individuals found guilty of violating the regime of the National Landscape Zakaznik Kotra shall be prosecuted in accordance with the laws of Belarus;
- the damage caused by violation of the zakaznik regime shall be recovered by legal entities or natural persons in the amount and according to the procedure established by the laws of Belarus.

24. Suggested conservation measures

In order to effectively protect the wetlands it is advisable to develop a joint Belarusian-Lithuanian management plan for the single natural complex including the projected Kotra zakaznik and the Capkeliu reserve.

1. Within the management plan for sustainable operation of the wetland ecosystem, maintenance of optimal ground water table regime on the whole territory of the wooded wetland Kotra-Capkeliu, and development of the relevant biological diversity taking into account the land-users' interests, the Belarusian side is expected to:

- study the hydrological regime and the current state of the drainage network both on and around the site;
- design the necessary water-regulating facilities;
- reinundate the Novodvorskoye Forest District's worked-out peatland located in the immediate vicinity of the projected zakaznik;
- modify the operational rules for drainage systems around the zakaznik;
- in order to facilitate optimal land-use – elaborate a zoning project for the Kotra zakaznik, which shall play the role of economically and environmentally sound legal base wisely regulating the agricultural activities in the region;
- establish a protected zone around the whole wooded wetland, develop and recommend utilization of environmentally-friendly management technologies for the zone;
- prepare recommendations for introduction of ecotourism taking into account the zoning project provisions, including designing of tourist routes on the zakaznik's territory and the adjacent areas, creation of infrastructure necessary for development of ecotourism;
- raise awareness of the local people about the biological diversity and significance of the Kotra zakaznik and the Ramsar site Kotra;
- monitor water levels and quality within the zakaznik an on the adjacent areas, flora and vegetation associations, and animal populations for accurate assessment of the wooded wetland's ecosystem and timely modification of the management plan's implementation schedule.

25. Scientific research and facilities

A comprehensive scientific research on the territory of the projected Kotra zakaznik was conducted by specialists from the Institute of Zoology and Experimental Botany of the National Academy of Sciences of Belarus in 1999 – 2002 within the framework of developing a scientific rationale for establishment of the zakaznik. Complete lists of vertebrates, higher vascular plants and lichens were compiled; landscape complexes and plant associations described; rare and protected kinds of plants and animals identified.

For successful management of biocenoses of the projected zakaznik, one needs to perform complementary study of the hydrologic regime both inside and outside of the site in question. Besides, it is necessary to conduct a more detailed study of a number of the wetland's taxonomic groups that were neglected or inadequately examined during preparation of the scientific rationale.

26. Conservation education

None at the moment, but potentially topical taking into consideration the projected establishment of the Kotra zakaznik and its high conservation value in the region. The conservation education should be first organized among the people utilizing zakaznik's territory for agricultural purposes, and among residents of the neighboring towns (schoolchildren in particular).

27. Recreation and tourism

The protected site is created on a remote heavily waterlogged and wooded area practically devoid of infrastructure necessary to set up and develop recreational activities. Currently the main forms of recreational activities performed on the territory of projected zakaznik are hunting, collecting of mushrooms and berries by people from the adjacent villages.

It seems that the recreational aspect of the protected area might be substantially enhanced through development of international ecological tourism. The potential tourist routes could include the unique natural complexes of both the Capkeliu reserve and the projected Kotra zakaznik. The Kotra River is especially valuable for ecotourists who could canoe starting from the section where the Skorbyanka River drains in the Kotra and then downstream to the village of Bershty and further on until the Neman. The floodplain biocenoses at that section of the river have been preserved in their natural state, and thus they are of great scientific, recreational, conservation, and esthetic value.

28. Jurisdiction

a)territorial jurisdiction: Shchuchyn district executive committee

b) functional jurisdiction:

Grodno Oblast Committee of Natural Resources and Environmental Protection: 23, Sovetskaya St., 230023 Grodno, Belarus.

Ministry of Natural Resources and Environmental Protection: 10, Kollektornaya St., 220048 Minsk, Belarus.

29. Management authority

The projected National Landscape Zakaznik Kotra falls under jurisdiction of the Shchuchyn district executive committee. The main structure supervising the established nature-conservation regime on the territory of the site is the Shchuchyn district inspection of natural resources and environmental protection, staffed with 3 persons.

Address of the Shchuchyn district inspection of natural resources and environmental protection is: Dom Sovetov, 231510 Shchuchyn, Belarus.

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Annex II

Modern state of most important bird species' populations of the Kotra wooded wetland.

The potential Ramsar wetland Kotra is a nesting site for a number of endangered and rare species according to the criteria of the International Union for Conservation of Nature (IUCN).

Endangered species

Great Snipe *Galinago media*. 15-20 pairs on the Lithuanian part of the Kotra floodplain. The research discovered some birds on the Belarusian side as well.

Rare species

Bittern *Botaurus stellaris.* A displaying male was found at the site's outskirts in the reed of Bershty Lake.

Black Stork *Ciconia nigra*. 3 nesting pairs found, frequent sightings during feeding in the Kotra floodplain and at the adjacent drainage systems.

Gray Goose *Anser anser.* Sighted on the territory during spring migrations in the Kotra floodplain during high spring tides.

Common Goldeneye *Bucephala clangula*. Rare sightings. 2 pairs and a female with a brood found in the Kotra floodplain.

Montagu's Harrier *Circus pygargus.* Considerable population. 5-7 pairs nesting at the outskirts of the site.

Kestrel *Falco tinnunculus.* 2 pairs sighted in the southwestern section of the potential Ramsar site.

Hobby falcon *Falco subbuteo.* 1 pair also sighted in the southwest of the Kotra site.

Capercaillie *Tetrao urogallus.* Rare sightings. Two small displays spotted in the northwest of the wooded wetland.

Crane *Grus grus.* Regular nesting species of the site (up to 15 pairs). Sighted in quarters 13, 14, 134, 222 of the Novodvorskoye Forest District, and quarters 153-154 of Pervomayskoye Forest District. Popular nesting site in the waterlogged section of the Kotra floodplain. Feeding cranes were spotted on the agricultural fields adjacent to the wooded area.

Wood Sandpiper *Tringa glareola*. Spotted within the zakaznik's territory during migrations. No nesting sites have been identified so far.

Eagle Owl *Bubo bubo*. Sighted in the Kotra floodplain, no nesting sites have been identified so far.

Tengmalm's Owl *Aegolius funereus*. Rare sightings in the damp mixed forests in the central section of the zakaznik.

Green Woodpecker *Picus viridis*. Sighted on the territory, no nesting sites have been identified so far.

Great Gray Shrike *Lanius excubitor*. Spotted at the bogs' outskirts in the central and northern sections of the site.

Spotted Nutcracker *Nucifraga caryocatactes.* Sporadic sightings all over the territory in spruce growths, population of about 10 pairs.

Besides, endangered species or species qualifying for the status in Europe and Belarus (I SPES category) have been registered in the Kotra floodplain – Great Snipe *Galinago media* and Corncrake *Crex crex*.