Transboundary Cooperation among Protected Wetlands in the Tumen River Estuary

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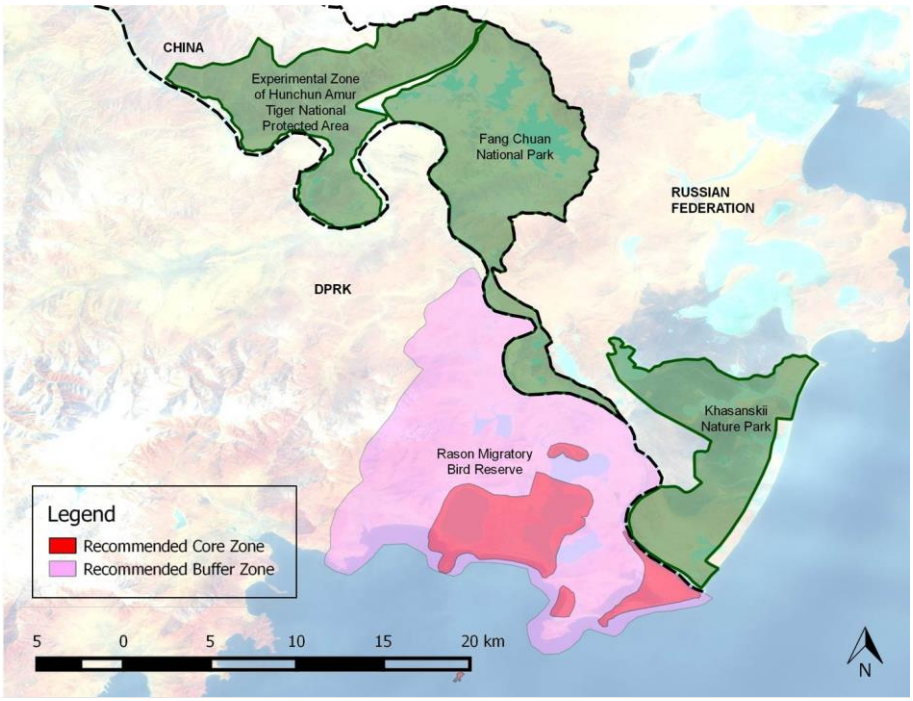
1. Introduction

Since the adoption of the North-East Asian Subregional Programme for Environmental Cooperation (NEASPEC) Nature Conservation Strategy in 2007, the NEASPEC member States have supported the implementation of several major projects on the conservation of migratory birds and habitats.

Based on the outcomes and findings from two projects, "Conservation and Rehabilitation of Habitats for Key Migratory Birds in North-East Asia" and "Connectivity Conservation and Transboundary Cooperation in North-East Asia", the member States considered strengthening the coordination among protected areas located along or near the national boundaries. This includes creating a transboundary protected area, such as the transboundary Ramsar site involving the Rason Migratory Bird Reserve in the Democratic People's Republic of Korea (DPR Korea), the Khasansky Nature Park in the Russian Federation, and the wetlands in Jingxin and Fangchuan National Park in China in the Tumen River Estuary as a concrete example (Figure 1).

The Tumen River Estuary is an important area with rich biodiversity and habitats for globally endangered and vulnerable species, including flagship species[1] of the NEASPEC. Three neighboring countries, i.e. China, DPR Korea and the Russian Federation, have already recognised its ecological importance and introduced conservation measures such as designating the area as a nature reserve.

Figure 1. Wetlands and Key Protected Areas in China, DPR Korea and the Russian Federation at the Tumen River Delta



Source: Rason Migratory Bird Reserve: Birds and Habitats (2014), NEASPEC and HSF

[1] NEASPEC flagship species include Amur tiger, Amur leopard, Snow leopard, Black-faced Spoonbill, White-naped Crane and Hooded Crane; and five of them (except Snow leopard) are found in the Tumen River area. For more information, http://www.neaspec.org/our-work/nature-conservation

While research and monitoring in the Chinese and Russian territories of the Tumen River Delta indicated that it is a habitat for thousands of migratory bird species, a complete picture of the Tumen River Delta habitat could not be drawn due to the lack of information on the DPR Korea side until the early 2010s. In this regard, ESCAP Subregional Office for East and North-East Asia (ESCAP-SOENEA) and Hanns-Seidel-Foundation Korea Office (HSF), with the support of the Economic Cooperation Bureau of the People's Committee of Rason City, conducted a field survey in Rason Migratory Bird Reserve during 26-31 March 2014.[2]

The field survey has produced the first markings of baseline information of the habitat, including key geographical information. Most importantly, it confirmed that the Reserve meets Ramsar criteria as an "internationally important wetland" and supports over a hundred species of birds (Annex 1).[3] Based on this initial finding, it was recommended that DPR Korea become a contracting party of the Ramsar Convention on Wetlands of International Importance (or Ramsar Convention) and designate Rason Migratory Bird Reserve as a Ramsar Site (Figures 2 and 3). Such recognition as an internationally important wetland also could provide a useful concept and framework for better management of the Reserve.

This work came to fruition with the accession of DPR Korea to the Ramsar Convention as the 170th contracting party and the certification of Rason Migratory Bird Reserve and Mundok Migratory Bird Reserve on 16 May 2018. On 13 October 2019, the Ministry of Land and Environment Protection, DPR Korea, organized its first Swan Goose Festival at Mundok Migratory Bird Reserve. A total of 160 participants, including embassy representatives from Mongolia, the Russian Federation and UN agencies attended the event.[4] In addition, the authority of Rason city considered a Swan Festival to promote eco-tourism and further facilitate wetland conservation. It opens the possibility of comprehensive joint management of the Tumen River Estuary among all three neighboring countries with scientific backgrounds and conservation measures. Strengthened cross-border cooperation would be further sought by jointly applying for Asia's first transboundary Ramsar Site.

Noting the outcomes of DPR Korea's efforts for the conservation of migratory birds and habitats, this report focuses on the Chinese and Russian sides of the Tumen River Estuary, which provides updated information on the following aspects:

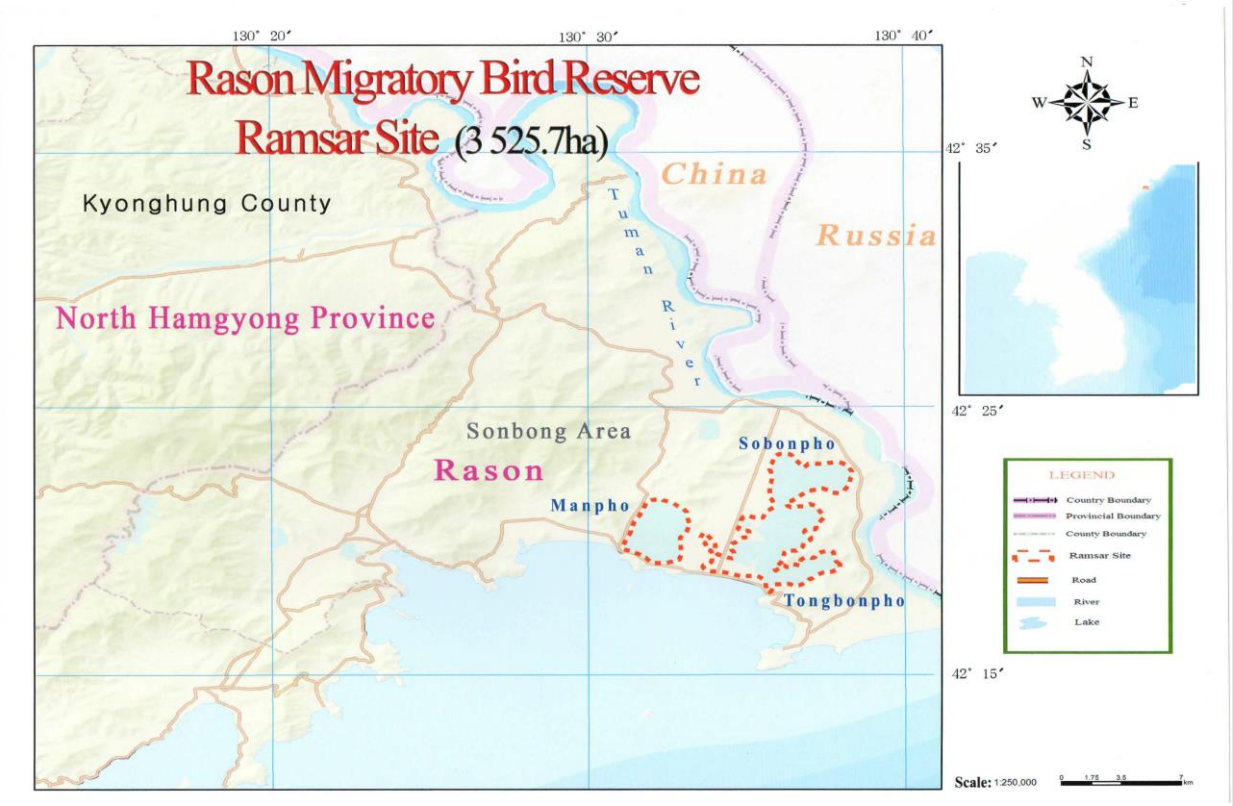
- An overview of the ecosystem integrity and ecological connectivity in the Tumen River Estuary;
- A detailed review of both Jingxin wetland of China and Khasan wetland of the Russian Federation, with updated information on their current status, environmental and socio-economic pressures, conservation and management systems, as well as challenges and opportunities; and
- A discussion on developing a joint management mechanism among China, DPR Korea and the Russian Federation to conserve the Tumen River Estuary better.

[2] "Rason Migratory Bird Reserve: Birds and Habitats" is accessible at http://www.neaspec.org/sites/default/files/Rason%20migratory%20bird%20reserve_birds%20and%20habitats.pdf

[3] See 2 above

[4] EAAFP, 2019

Figure 2. Map of Rason Migratory Bird Reserve



Source: Ramsar Sites Information Service, available at: https://rsis.ramsar.org/RISapp/files/26521667/pictures/KP2343_map180503.pdf?language=en

Figure 3. Photos of Rason Migratory Bird Reserve

	Lagoon Tongbon
	Lagoon Sobon
	Lagoon Man

Source: Information Sheet on Ramsar Wetlands for Rason Migratory Bird Reserve – publicly unavailable

2. Overview of ecosystem integrity and ecological connectivity in the Tumen River Estuary

2.1. Geographical introduction of the Tumen River Estuary

The Tumen River Estuary and riverine plain, nearly 1,000 km^2, is under the jurisdiction of China, DPR Korea and the Russian Federation and represents a comprehensive ecosystem consisting of wetlands, farmlands, savannah, forests and sand dunes.

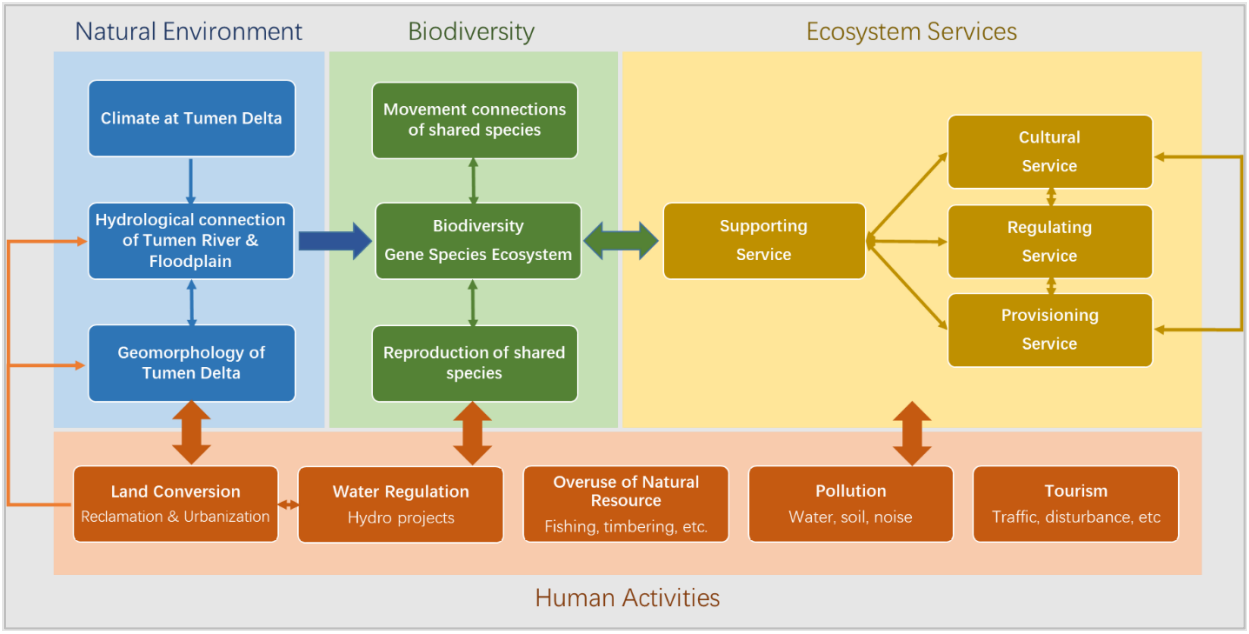
Wetland complex of the Lower Tumen starts from Jingxin Town (China) and about 55 km from the estuary is formed by comprehensive effects of geological, riverine, marine and climatic factors, with uniqueness and rich diversities in geomorphology. The types of wetlands are various from riverine, lake, marsh, coastal to manmade, and some are neighbored by sand dunes. These wetlands are mainly distributed in the Jingxin basin (China), Khasansky (Russian Federation) and Rason (DPR Korea). The total area of these wetlands is about 80 km^2 in Jingxin,[5] 330 km^2 (excluding coastal) in Khasan,[6] and 115.6km^2 in Rason.[7]

Wetlands in the lower Tumen are characterized by complex distribution, including separate waterbody with channelised linkages.

- Geographically, the wetlands complex consists of one integrated landscape at Tumen delta with a side length of less than 40 km. Distance between adjacent individual waterbodies in three countries is normally less than 5 km, and most are around 1-3 km.
- Hydrologically, the wetlands are connected either by channels or underground water, and all wetlands in the upstream Fangchuan are floodplain wetlands such as oxbow lakes and plain reservoirs;[8] while Khasansky and Rason wetlands were affected by the marine process and consist of both freshwater and brackish water lakes.
- Biologically, there are aquatic fauna and flora connections among the water systems in wetlands, and waterbirds can easily fly across the delta region hourly.
- Ecologically, it was reported that 2,090 species of vascular plants and 422 species of animals at the river shed scale,[9] more than half the number of species of vascular plants and three-fourths of animals were reported in the lower Tumen.
- All these connections are under interventions of human activities and will influence human ecological feedback (Figure 4).

[5] 2016 forest phase database of Hunchun Forestry Bureau
[6] Lai To. L., 2021.
[7] ESCAP data in 2014
[8] Jia Weixin et al., 2017
[9] Chai Xinxin et al., 2003

Figure 4. Conceptual Model of Tumen Delta Ecosystem Feedback



The ecosystems in the Tumen River Estuary present the same biota via multiple connections in three countries. It is reported that there are 32 species of fish, 8 species of amphibians, 126 species of birds, 24 species of mammals, and 305 vascular plants in Jingxin wetlands.[10] A joint field survey by ESCAP-HSF at Rason wetlands recorded 111 species and more than 42,000 individuals of birds in 2014. The list of birds of Khasansky wetlands counts 285 species, not including seabirds. Endangered species were reported in all three counties in various literature, including Red Crowned Crane, White-naped Crane, etc.[11]

2.2. The Tumen River and its ecosystem integrity

Noting the abovementioned ecosystem integrity and the connections of geographical, hydrological, biological and ecological features of the Tumen River Estuary, it is found that any change in any of the three countries may affect its landscape pattern, hydrologic processes and biological attributes, particularly, migratory waterbirds forage, roost and breed in different pieces of wetland habitat across national boundaries.

In addition, the Tumen River, with an annual freshwater runoff of 55,108 m^3, secures water supplies, stabilizes the saline balance, and controls desertification in the estuary, which underpins support for agriculture, industry and urban development.

The wetland complex also provides biological resources, including fisheries, agricultural products and food, materials, and habitats for biodiversity. The landscape, wildlife, and culture of the Tumen River Estuary lay the foundation for eco-tourism in China, DPR Korea and the Russian Federation.

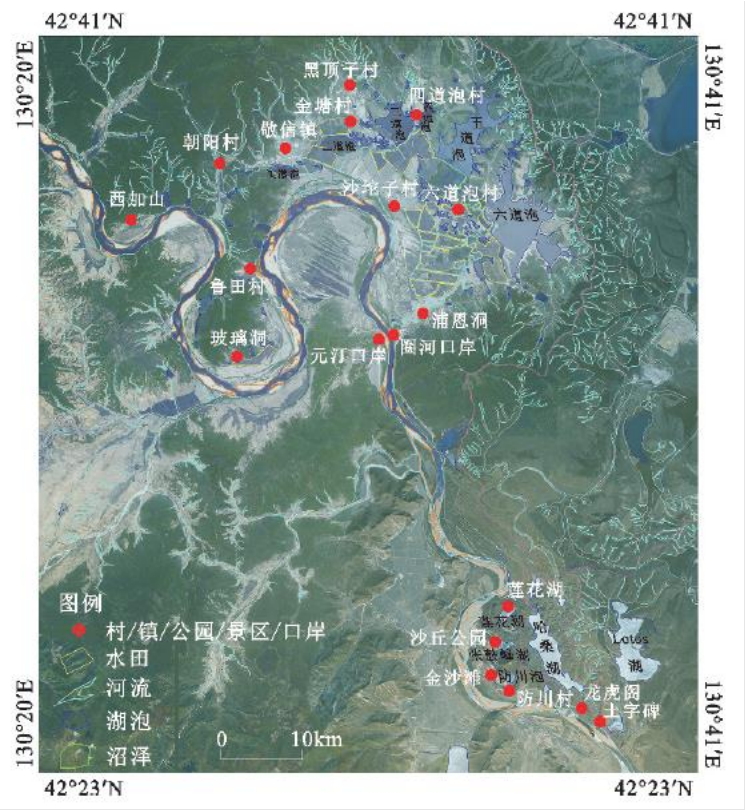
[10] Yang et al., 2006
[11] ibid.

3. China: the Jingxin Wetland

3.1. Geographical overview of Jingxin wetland

The Jingxin wetland (129°52′00″-131°18′30″E, 42°25′20″-43°30′18″N) encapsulates all types of wetlands distributed along the lower Tumen River located in the Hunchun county, east western Yanbian Korean Autonomous Prefecture of the Jilin province, China. It is an important region for the perching and reproduction of various bird species spreading along a total area of 24,080 ha in the east of Changbai Mountain. Comprised of various forms such as rivers, lakes and swamps, the Jingxin wetland plays an important role in the local ecology.[12]

Figure 5. Distribution Map of Wetlands in the Lower Tumen River



Source: Jia Weixin, et al., 2017

The Jingxin wetland can be divided into five sub-systems according to the terrain of the sites: (1) river wetland which is mainly refers as the Tumen River and its tributaries; (2) lake; (3) swampy wetland; (4) flood wetland; and (5) artificial wetland, among which river wetlands and lakes belong to the Tumen River system. The Tumen River crosses the wetland with a total length of 54.6 km, and the Quan River is its main tributary. There are 12 ponds and reservoirs, with a total area of 757 hm^2.

It can also be fragmented by residential areas, fishponds and agricultural farmland - with some of the natural wetlands turned into artificial wetlands. This area is located in the middle and low mountain areas

[12] Pengyou Shi and Huizi Lv, 2016; Huitian et al., 2014; From Hunchun Nature Reserve unpublished document

of the eastern Changbai Mountains, surrounded by mountains on three sides. The area also belongs to a temperate offshore monsoon climate zone with an average temperature of 5.6℃. Thus, the climate is windy in spring and autumn; and wet and mild. The compound effects of the topography, climate and ocean have created various geographical and geomorphological landscapes, especially those in the wetland form.

3.2. Status and trends

Finding #1: The Jingxin wetland provides an invaluable ecosystem and habitat for various key species, including critically endangered species.

The Jingxin wetland is one of the key protected wetlands in the Jilin province, China. Located in the transitional area of the land and water system, the Jingxin wetland shows two features: (1) a high level of biodiversity; and (2) unique habitat for various species of wildlife and rich genetic materials.

With its unique geographical location and ecological environment, the Jingxin wetland provides an invaluable ecosystem and habitat for birds and animal wildlife, including endangered species. For example, it is an important transit station for migratory birds in Northeast China. About 200 species of migratory birds stay here each year during their migration from April to May and September to October. Some of them are listed as key species at the national level. In addition, the Jingxin wetland is a critical place for Red-crowned cranes' migration from Japan to Xingkai Lake and the Sanjiang Plain. In the spring of 1989, 21 Red-crowned cranes were recorded, and at the same time, more than 2,000 White-fronted goose, more than 30 swans, 60 White-tailed sea eagles, and 2 Steller's sea eagles were recorded.

Wild animal species are rich in the Jingxin wetland; some are unique species with important gene pools. 109 species (62 families, 31 orders) of wildlife are recorded, including 32 fish species (10 families, 7 orders), 8 amphibians (7 families, 3 orders), 126 bird species (32 families, 15 orders) and 24 mammals (13 families, 6 orders). The world endangered Amur Leopard and Amur Tiger are also distributed in this area.[13]

In addition, with the coverage of forests, grasslands and wetlands and the complex composition of wild plants, Jingxin has complicated vegetation components. In 2017, 153 species (109 genera, 54 families) of vegetation were recorded, and more than 60 medicinal vegetation were also found.[14] More than 60 species of vegetation, such as water lily - a typical species distributed in this area - are listed as endangered or rare species at the national or provincial level. Pine, willow, birch, Rosaceae, Compositae, Gramineae and Cyperaceae are the main species of seed plants, showing the characteristics of the forest and wetland's vegetation. There are several large water holes called "paozi" by local people, and there is an abundance of wild vegetation distributed in and around these areas. Vegetation species in the Jingxin wetland are shown in Table 1 of the report.

The density of wetland vegetation in Jingxin doubles the density of vegetation in other wetlands in China.[15] For instance, *carex tabulaeformis, carex macrophylla* and reed plants are widely distributed in Jingxin,

[13] Guang Yang, 2006; Jilin Forestry Department, 1999

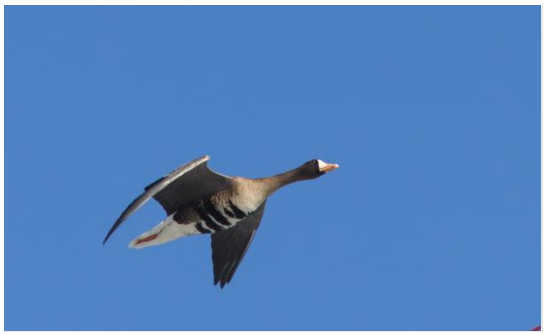
[14] Weihong Zhu et al., not published report

[15] The density of wetland vegetation in Jingxin is 0.0056 species/km^2, which is twice as 0.0028 species/km^2 in China.

with the purification ability of *carex tabulaeformis* being the strongest, followed by *carex macrophylla* and reed.[16]

Figure 6. Birds in Jingxin Wetland

a. Bean goose



b. White-fronted Goose

c. Red-billed gulls

d. White-tailed sea eagle

[16] The purification ability significantly correlates with the number of soil microorganisms in the rhizosphere of the three wetland plants.

Table 1. Vegetation Species in the Jingxin Wetland

Family	Genera	Species	Family	Genera	Species
Gramineae	11	17	Gentianaceae	1	1
Compositae	7	12	Asclepiadaceae	1	1
Sedge	6	17	Ranunculaceae	1	1
Labiatae	5	6	Equisetaceae	1	1
Leguminosae	4	4	Lythaceae	1	1
Polygonaceae	2	10	Rosaceae	1	1
Onagraceae	2	4	Onodeaccae	1	1
Commelinaceae	2	2	Umbelliferae	1	1
Urticaceae	2	2	Moraceae	1	1
Juncus effusus	1	3	Sheguke	1	1
Typhaceae	1	2	Brassicaceae Burnett	1	1
Alismataceae	1	2	Caryophyllaceae	1	1
Water chestnut	1	1	Araceae	1	1
Nelumbonaceae	1	1	Halorrhagidaceae	1	1
Sparganiaceae	1	1	Scrophulariae	1	1
Cucurbitaceae	1	1	Salicaceae	1	1
Salviniacae	1	1	Ulmaceae	1	1
Lemnaceae	1	1	Pontederiaceae	1	1
Plantaginaceae	1	1			

Source: Weihong Zhu et al. Unpublished report, 2017

Finding #2: The Jingxin wetland has witnessed soil degradation, habitat loss and biodiversity loss due to population increase, local constructions, and economic development.

The Tumen River Estuary has suffered different levels of disturbance and destruction due to longtime human impacts. Its downstream loss is the most severe. As the Jingxin wetland is distributed in the downstream region, it faces biodiversity loss and soil degradation, which can directly cause wetland loss.[17]

According to a comparison study of remote sensing images between 1964 and 2004,[18] the following findings as of 2004 were reported, compared with the year 1964:

1) The river patches of the Jingxin wetland decreased by 25 pieces;
2) The Jingxin wetland area decreased by 12 km^2;
3) The area of swamps decreased by 50%;
4) The area of constructed wetlands increased by 16.923 km^2; and

[17] Xiaojun Zheng et al., 2016
[18] Liu Zhifeng et al., 2009

5) The area of natural wetlands decreased by 17.33km^2.

Population increase, human activities and economic development has led to Jingxin wetland loss. For example, local farmers use the natural wetland and rivers to expand their farmland. In the 1980s, the swamp wetland in Jingxin was around 2,000 km^2 and served as the only habitat for breeding and resting area for the endangered migratory birds. However, by early 1998, 1/4 to 1/5 of the region was changed to paddy fields.[19] Artificial wetland area also has been increasing due to the Longshan reservoir construction, as well as the expansion of paddy fields, fishing ponds and hatch pond.[20] Other reasons for the Jingxin wetland loss include economic development and population increase.[21]

Finding #3: The Tumen River downstream area provides unique geographical features for transboundary socioeconomic development.

The downstream region of the Tumen River has unique geographical features. It serves as the crossroads and hub for transboundary trade, transport, industry and energy in China, DPR Korea, Japan, the Republic of Korea and the Russian Federation, among other countries. UNDP initiated the Tumen River Area Development Project in 1992 to promote international communication on economic development, based on *The outline of the development and development plan for the Tumen river in China* and considering the developmental needs of the area, such as harbour construction and transportation system development.

In order to further promote transboundary cooperation and speed up the socio-economic development in downstream of the Tumen River Estuary, China considered the area one of the important sites for the Belt and Road Initiative implementation.[22] In addition, the Tumen River area is expected to be developed as an international collaboration demonstration area and a comprehensive tax-protected zone for border economy cooperation and ocean markets with new trade forms.

The city of Hunchun (China), where the downstream of the Tumen River (including Jingxin wetland) is distributed, was listed as one of the 14 marine economic demonstration cities in 2019. Aligned with the proposal on the national support to ocean development and marine economic demonstration cities, put forward by the National Committee of the Chinese People's Political Consultative Conference in 2019,[23] Hunchun has made efforts to 1) increase the sea production in the industrial zone of the city; 2) enlarge the production capacity on an industrial scale; 3) extend industrial supply chains; 4) develop sea product brands; 5) promote ocean tourism projects and develop ocean tourism.[24] Hunchun also established the Geography and Ocean Science college at Yanbian University to promote marine product development and trade.

With the aim to transform the city of Hunchun into a middle-level modern city that has the capacity to mobilise more information and human resources, the Hungchun government has implemented several major projects in the sectors of transport, trade, marine development and tourism. For example, it has developed a three-phased Hunchun International harbour project to promote logistics among China, DPR Korea and the Russian Federation. The project covers an 85 hectare area close to the Hunchun railway

[19] Jilin forestry department, 1999
[20] Zhifeng Liu et al., 2009
[21] Yuhui Liu et al., 2004
[22] Yangjun, 2015
[23] CPC News, 2019
[24] Tumen News, 2021

port area, with a total construction investment of 1 billion RMB (approximately US$ 148 million). In addition, it opened additional ports for transportation between Hunchun and other cities nationally and internationally.[25] The transportation system between Hunchun and Zhoushan harbour will also be strengthened, and a more convenient transportation system will be developed.

Hunchun city is also a premier tourist site. The Jingxin wetland, located in the southernmost part of Hunchun city, is the main attraction site of Hunchun, particularly Fangchuan (Figure 7). Since the Fangchuan National Scenic area was established as an important tourist attraction site, the Hunchun government has provided funding and policy support and built a series of travel facilities such as Wanghaige, Longhuge, sand park and lotus lake park. Relocated Fangchuan village residents, for economic reasons, are now returning to the town to operate home-stay businesses.[26]

Hunchun city also holds the Goose Watching Festival every March or April to attract domestic and international tourists. In Longshan lake, located in the centre of the wetlands, facilities for bird watching and photography have been built. Consequently, more travelers have visited the area and restaurants and hotels have increased profits during the migratory season. Tourism plays an important role in the local economy but bears risk to the local ecology due to China's large population.

The tourist industry in Hunchun has further untapped potential for development, for instance, by focusing on its local characteristics, such as its unique Korean-Chinese culture, Changbai Mountain and Fangchuan area (see Figure 10 for three countries view). Ecotourism such as bird watching has not yet been broadly introduced or organized by local tour companies, thus, there are limited bird watching guides available.

The tourism development in China, DPR Korea and the Russian Federation are all in varying stages. In China, tourism development in the Yanbian area has been rapid, and the market has become more stable. However, the development of tourism in the DPR Korea border area has been slow due to economic and political limitations. In the far east of the Russian Federation, tourism has also developed slowly due to economic deprivation over the past years.[27]

[25] Xinhuashe, 2019
[26] Yanbian Broadcast and Television Station, 2019
[27] Yanling Wen and Qianyu Zhang, 2010

Figure 7. Fangchuan Residence House for Travelers

Source: Yanbian Broadcast and Television Station, 2019

Figure 8. Bird Watching at Longshan Lake

Source: from internet[28]

Figure 9. Migratory Birds in the Jingxin Wetland

Source: photo taken by Li Zhijun

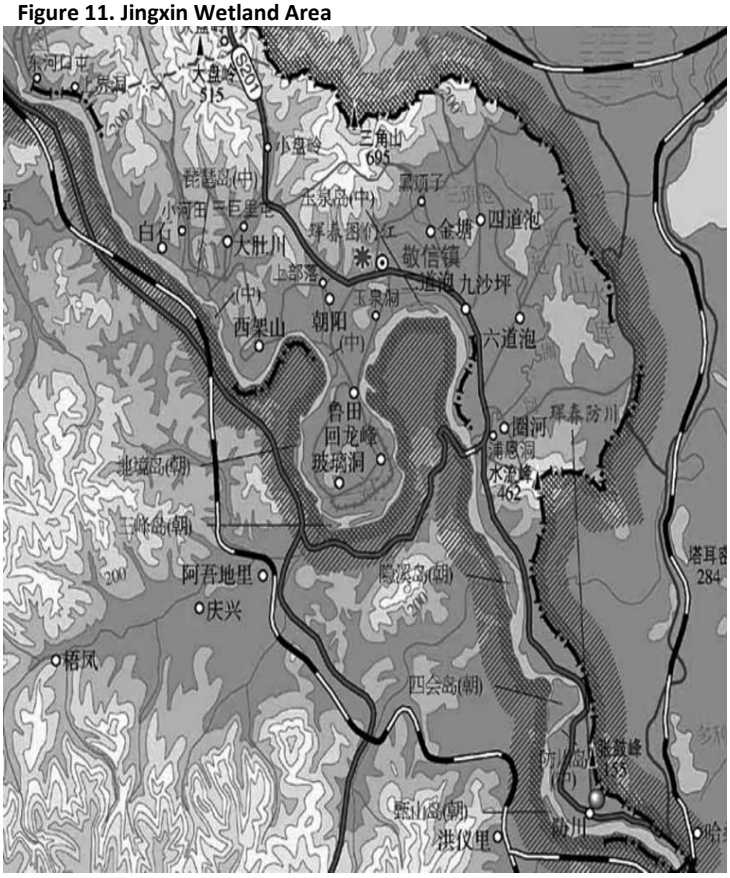
Figure 10. Fangchuan Area Viewed from China, DPR Korea and the Russian Federation

Source: from internet[29]

[28] China Jilin webpage at www.cnjiwang.com

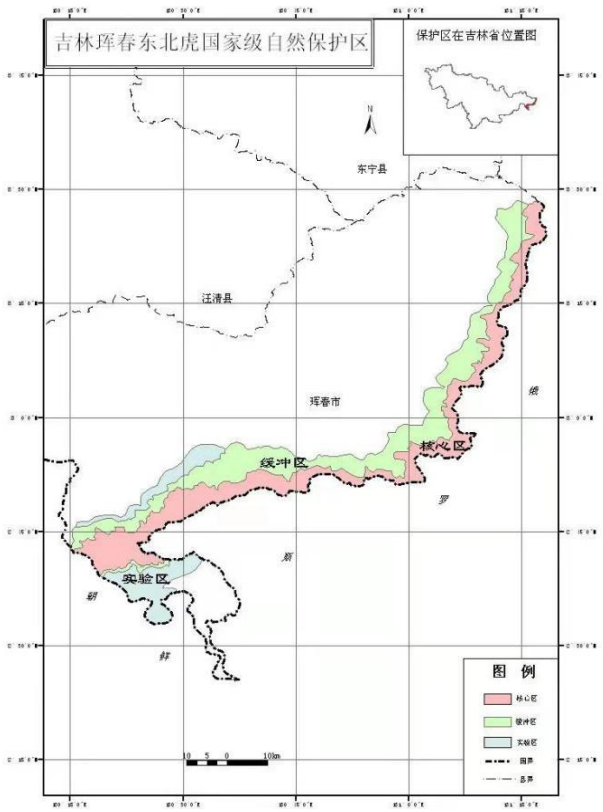
[29] From https://passportparty.ch/2020/10/17/a-look-into-north-korea-and-russia-sightseeing-in-fangchuan/ and https://www.laitimes.com/en/article/151q0_161to.html, respectively

Figure 11. Jingxin Wetland Area



Source: Mingyou Shi and Huizi Lv, 2016

Figure 12. Hunchun Amur Tiger National Nature Reserve



Source: from internet[30]

Finding #4: Challenges and opportunities faced by the Jingxin wetland area require strategic plans and synergies of environmental conservation and socioeconomic development.

Tourism and marine economy development projects in the Jingxin wetland area will have a considerable adverse impact on environment conservation if strategic plans and synergies of sustainable development are not carefully considered. For example, expanding farming areas (especially paddy fields) and traditional grazing style areas may decrease the wetland size, and the fish-pond industry may cause the wetland landscape to become more fragmented. Ocean economic development may also bring potential threats to the local ecology. Population increases, heavier traffic and harbour constructions may adversely impact the ecology if development activities are managed poorly. Industries relying on wetland resources may also be threatened.

[30] https://baike.baidu.com/pic

Table 2. Current Use of the Jingxin Wetland

Area	Way of use
River area	The Quanhe River and the Tumen River currently do not have a specific use with poor conservation management. Further, there is potential to develop sustainable eco-tourism programs.
Natural wetland	The area loss due to farming has been an unsustainable land practice. The wetland size is increasing with the very important reason of the farming activities. Increased education and law enforcement are needed.
Bird watching	The purpose is to protect migratory birds resting for one month in the Jingxin wetland. Migratory birds provide increased opportunities for the local people, especially those running restaurants and home-stay services. There is also potential to attract people to enter the local tourist industry to expand bird watching activities. Examples may include training residents as bird guides or creating local hand-made souvenirs. Further scientific training will be needed for disease prevention and migratory bird management.
Tourist sites around wetlands	Especially in the Fangchuan area, there is a lack of wetland facilities, thus further wetland-related programs could be developed.

Considering its geographic location at the junction of China, DPR Korea and the Russian Federation, the Jingxin wetland area is critical for all neighboring countries to work together for a more balanced plan between wetland conservation and economic development. China is favourable for promoting conservation activities in this area. Since 2009, the central government has started a pilot program to provide compensation for wetland ecology. For instance, a special fund allowance for wetland projects was established in 2010; and an ecological civilisation construction outline designated the wetland's conservation red line in 2013. In the same year, the State Forestry Administration (currently NFGA) announced its wetland conservation management regulation. Thus, sustainable development can be congruent with such guidelines.

3.3. Institutional arrangement and networks in Jingxin wetland management and use

Finding #5: Conservation authorities for Jingxin wetland management are at provincial- and local-levels.

Due to administrative reform in China in 2018, conservation authorities have undergone numerous changes - including new management strategies, plans and management regulations - which are to be revised or implemented in the near future. The Ministry of Natural Resources was established in 2018, becoming the main conservation management authority at the national level in China. It administers the National Forestry and Grassland Administration (NFGA), among other associated departments and affiliated agencies. NFGA administrates the implementation of national policies, decisions and plans to govern forestry and grassland related work in China. At the local level, the previous systems, such as the Hunchun Nature Reserve and Hunchun Forestry Bureau, still exist, but now are a branch of the National

Park Administration. Staff management, as well as national park regulation are being reformed, but it will take some more time to ensure everything is organized at the local level.

As for the Jingxin area, it is currently under the management of the Hunchun Forestry Bureau (municipal-level) and is not included in any of the national-level conservation plans for protected areas in China. Despite noting that it was registered as Jingxin National Forestry Park (i.e. current Tumen River National Forest Park) in 1997 and used to be a part of the provincial-level nature reserve (i.e. Hunchun Amur Tiger Provincial Nature Reserve) in 2001, the Hunchun Forestry Bureau now takes responsibility for the whole wetland's management, while wildlife issues will be taken under the management of Hunchun Nature Reserve, and tourism-related issues will be managed by the Scenic Area Management Bureau of the municipal government of Hunchun.

Table 3. Conservation Authorities of the Jingxin Wetland

Name	Description
Hunchun Forestry Bureau 珲春市林业局	Managed by the Government, National Forestry and Grassland Administration, National Park Administration Working on wildlife management
Scenic Area Management Bureau 风景名胜区管理局	Managed by the Government Working on the Fangchuan scenic area management
Hunchun Tiger Nature Reserve 珲春东北虎自然保护区管理局	Managed by the Government, National Forestry and Grassland Administration of China, National Park Administration Working on wildlife management

Finding #6: Local communities are faced with environmental and economic development challenges

For local communities, the main sources of income are agriculture, grazing livestock (primarily cattle), beekeeping and fishing (especially in the Tumen River region). However, expanded farming areas and traditional grazing practices have negatively influenced the local wetland ecology and environment.

Table 4. Impacts on Local Communities by Economic Development in the Jingxin Wetland

Local stakeholders	Livelihood changes by development projects	Benefit/loss from wetland
Local villager (e.g. farmers)	The income of local villagers has increased through various poverty reduction activities orchestrated by the government. However, agricultural livelihood practices such as traditional grazing methods or wetland farming techniques have not changed.	half (some benefit from growing wetland-friendly products)
Restaurant owner	-	Benefit
Local ecotourism related company (e.g. Longshan lake Industrial Co., Ltd.)	-	Benefit
Mining company	-	Loss

Jingxin area, the most southern part of Hunchun, is an important place for tourism. Fangchuan scenic zone is one of the eight famous tourist sites in Jilin province. A compensation project began in 2007 to cover harvest or livestock damages incurred by wildlife, such as migratory birds (especially goose species). All applications for compensation are reviewed and evaluated by the Forestry department

Table 5. List of Key Local Stakeholders in the Jingxin Wetland

Name	Description
Amur tiger and Amur leopard monitoring and research center, state Forestry and Grassland Administration of China, National Park Administration 国家林业和草原局国家公园管理局东北虎豹监测与研究中心	Managed by the National Forestry and Grassland Administration, and National Park Administration Working on wildlife monitoring and research
Amur tiger and leopard National park research institute 东北虎豹国家公园研究院	Managed by Beijing Normal University and Yanbian University Working on wildlife monitoring and research
Northeast Tiger and Leopard Biodiversity National Observation and Research Station 东北虎豹生物多样性国家野外科学观测研究站	Managed by the Ministry of Science and Technology
Key laboratory of SFGA on Conservation Ecology in the Northeast Tiger and Leopard National Park 东北虎豹国家公园保护生态学重点实验室	Managed by the National Forestry and Grassland Administration, and National Park Administration Working on wildlife monitoring and research
Jilin Hunchun Wildlife Conservation Association 吉林省珲春市野生动植物保护协会	Chinese NGO
Global Protected area friendly system 保护地友好体系	Chinese NGO http://www.baohudi.org/
Photographic Society in Hunchun 珲春摄影协会	--
Hunchun Tourist company	List shown in the footnote[31]
Restaurants in Jingxin	List shown in the footnote[32]

Finding #7: Other important stakeholders have broadened the network and contributed to the Jingxin wetland conservation.

Those who have pond contractors in the Jingxin and Fanchuan areas had access to these areas and utilized wetland resources for economic purposes - such as farming fish, shrimp, crab and ducks. Local restaurants have used local produce for years, with customers traveling to sample the local wild goose. However, after the introduction of strict management rules for restaurants, it is rare to see such occurrences.

The Yanbian state government established a wetland center to improve science-policy linkages to bridge the gap between researchers and policy makers. The center's main objectives include conducting wetland resource surveys; monitoring changes in the wetland landscape; and providing conservation suggestions based on science. The center cooperates with academia and researchers, and conducts monitoring and sustainable development research to inform legislation. Other organizations, such as the Wildlife Conservation Society, World Wildlife Fund and Baohudi (Chinese organization), have worked in this area for a long time and contributed to capacity building and fund-raising for wetland conservation.

[31] The list of tourist companies in Chinese: 宇通国际旅行社，东方龙旅行社，三国情旅行社，珲春国际旅行社，信成旅行社，时代旅行社，驴妈妈旅行社，滨海国际旅行社，泰达国际旅行社，红菊国际旅行社

[32] The list of Chinese restaurants includes: 敬信饭店,望海饭店,莲花饭店,渔米乡饭店,独一处饭店,荣华园饭店,旺好角饭店,吉春农村饭店,延边圈河农家乐饭店,心和饭店

In addition, an increasing number of environmental charities and NGOs in China have been active and dedicated to nature conservation than ever before. New programs, such as the 2016-2026 migratory birds conservation project of “Renniaofei”, have been launched by the SEE foundation to save hundreds of wetlands and 24 endangered wetland birds.

3.4. Gaps and needs analysis

Finding #8: Capacity building, in terms of mobilizing financial support and enhancing data management, is needed to better conserve Jingxin wetland.

Constant monitoring of wetland changes is essential for making management decisions. However, data and information on the Jingxin wetland area are inadequate to inform decision making. According to the current management department at the local level (Hunchun Forestry Bureau), the latest research on birds in the wetland area was funded by Baohudi in 2014. However, data is not readily available to the public yet as it was a joint research project. The Yanbian Wetland Centre, which is under the management of the Yanbian government, conducts monitoring of wetland landscape change and establishes databases for specific projects.

Furthermore, there is an urgent need for long-term monitoring activities in the Jingxin wetland. However, this presents a large challenge due to a lack of human resources and budget constraints. Due to insufficient funds, only a limited number of patrols can be conducted during the spring and autumn migration seasons to prevent bird hunting. With support from other conservation groups such as Baohudi and Jiushaping village, local communities have built farm patrol teams and now carry out daily patrols.

Table 6. Management Capacity in the Jingxin Wetland

Management group	Respective role	Responsibilities
Hunchun Forest Bureau	Wetland management in line with regulation	Education and patrolling to prevent poaching, etc.
Hunchun Nature Reserve	Management of wildlife related issues	Dealing with cases concerning wildlife (e.g. wildlife roadkill)
Scenic Spot Administration	Scenic spot management	Affairs related to scenic spots
Yanbian Wetland Protection Center	Yanbian Government wetland research center	Collect wetland information in Yanbian monitoring wetland change, etc.
local villages	Resource user (mostly for farming and grazing)	--
fishpond owners	Resource user	Tax

Despite the regular monitoring and daily patrols, there is a lack of quality information to prepare a well-structured development plan for the local area. The Jingxin wetland area, with insufficient funds and a lack of scientific knowledge, is faced with challenges in its effective management of wetlands.

Therefore, financial support and management capacity need to be enhanced to better conserve the Jingxin wetland, in particular for enhanced patrolling skills (e.g. GPS usage, map reading and driving), species identification skills (fauna and flora), law enforcement, data management and mapping

3.5. Conclusions

Finding #9: Synergies of regional and local development and conservation planning have yet to be strengthened.

The Tumen River downstream area possesses unique geographic features for transboundary cooperation in trade, transport, energy, ocean development and industry development, and thus China has a strategic plan for the socioeconomic development of the city of Hunchun and its associated Jingxin wetland area. Neighboring countries would need to work on creating the synergies of such socioeconomic development and conservation plans.

The Jingxin wetland is located in the downstream area of the Tumen River, where China, DPR Korea and the Russian Federation share the ecosystem, including forest, ocean and wetland. Although Jingxin wetland is not listed as a national-level wetland, it is important to recognize its unique features, as well as the invaluable ecosystem integrity and habitats it provides for various key species.

Over the decades of economic development, the Jingxin wetland has lost its natural swamp and is facing anthropogenic threats coupled with insufficient funding and management capacity. Despite all the benefits and sustainable ecological services that wetlands provide, the Jingxin wetland is challenged by economic development plans and its associated adverse impact on environmental conservation. It is expected that the Jingxin wetland will attract higher-level attention to improve its conservation and sustainable use.

4. Russian Federation: the Khasan Wetland

4.1. Overview

In the late 1990s, there was an attempt to make the estuary of the Tumen River and its adjacent water areas an internationally significant Ramsar Site. Its official name was “Khasan-Tumen River Delta”. The declared area of 87,400 ha covered the entire spectrum of aquatic habitats for birds and met the Ramsar criteria in excess.[33] The Russian government recognized the international significance of the site, and the greatest achievement was the inclusion of the site in the shadow Ramsar list with the prospect of it being transferred into the actual list.[34]

This status facilitated the creation of the Khasansky Nature Park, which occupied about half of the coastal lowland territory and is part of the shadow “Khasan-Tumen River Delta” site. Its establishment in 1997 was an emergency response to the plans being developed on creating an international industrial cluster in the estuary part of Tumen River, which envisaged a serious transformation and environmental risks of the Russian part of the border-adjacent wetlands (Tumen River Economic Development Area project).

The objective of this report is to review the current environmental significance of the Khasansky Park territory as an alternative (or successor) to the Khasan-Tumen River Delta (shadow Ramsar site) and as a candidate for joining the cross-border Ramsar site.

[33] Litvinenko and Shibaev, 1997

[34] National Report on the Implementation of the Ramsar Convention on Wetlands, Uruguay, 2015

When justifying the borders of the Khasan-Tumen River Delta site, the four major landscape and ecosystem components were taken into account. These four landscapes are characterized by their special contribution to the maintenance of biodiversity within the region (Figure 13-a).

1) Seaside brackish wetlands, which include:
   - A developed network of channels;
   - Fresh and brackish lakes;
   - Shallow lagoons located on the coastal lowlands (Lagunny site – 29,600 ha);
   - Coastal wetlands comprising the core of the land: the wetlands are the principal stopover and breeding site for numerous waterfowls, shorebirds, cranes, rails, grebes and others. They also provide foraging places for sea colonial species;
2) Freshwater wetlands (e.g. Karasik site, 3,400 ha) which provide important breeding areas for rare birds;
3) Shallow sea bays (12,400 ha), which provide important stopover sites for waterfowls and sea water birds; and
4) Costal sea waters (42,000 ha) which are partially non-freezing water areas providing mass nesting and wintering sites for sea colonial birds and wintering of waterfowl.

Figure 13. Territory Ratio of the Khasan-Tumen River Delta (Shadow Ramsar Site) and Khasansky Nature Park

a) "Khasan-Tumen River Delta" Shadow Ramsar Site (87,400.0 ha)

b) Khasansky Nature Park (12,298.2 ha)

Khasansky Nature Park occupies about half of the land core of the Khasan-Tumen River Delta shadow site. It has lost its sea and the shallow bay area completely, as well as the largest Ptichya lagoon. As a result, it has lost its importance in supporting the marine avifauna - about 15 species of colonial nesting birds numbering in the thousands, as well as an impressive list of migrants and wintering waterfowls that keep to the water area and vast bays. The most significant territory loss is the nesting habitats for the Black-faced Spoonbill and the Chinese Egret, located on the coastal island of Furugelm. The aforementioned losses require a reassessment of compliance with the Ramsar criteria.

4.2. Status and trends

Finding #10: Khasansky Nature Park has a low protection rank in the protected areas system in the Russian Federation with limited funding for its management and conservation.

Khasansky Nature Park is faced with two key challenges as a conservation park: (1) it has a low protection rank in the protected areas system in the Russian Federation; and (2) it is subject to regional government legislation rather than that of the federal-level.

These two challenges are also associated with a lack of funding. Due to insufficient funding, the park does not fulfill a significant portion of the functions declared and established at its inception. The Directorate was officially abolished about 10 years ago, and there is no staff. Instead, a ranger from another institution performs the function of territorial protection. Promising environmental projects (e.g., the creation of the Red-crowned crane breeding population) have been paused. After 25 years since the park's establishment, land and cadastral issues have not yet been fully settled, and the area and the functional zones of the territory are constantly under review. In general, there is a trend toward increased recreational load and the allocation of special areas that allow some of the previously mentioned activities.

Finding #11: The expert community has divergent perspectives on the inclusion of Khasansky Nature Park as part of the cross-border Ramsar site.

As the ornithological value of the Tumen River Estuary is universally recognized, the concept of designating a protected area with an emphasis on bird conservation has been floated since ornithological studies began in the region. Over the years, a variety of options for preserving the area have been suggested - from the creation of an independent federal nature reserve to merging the coastal wetlands with the already nearby and functioning Far Eastern Biosphere Marine Reserve.

Some of the expert community regarded the creation of Khasansky Nature Park as plausible measures to be taken at that time, while others regarded it as "losing ground". The disadvantages of this decision include:

1) The size of the park (i.e. 12,298 ha) was 3 times less than the land area of the shadow Ramsar site;
2) Its suboptimal localization and its regional (rather than federal-level) status, which did not guarantee the irreversibility of the protected status.

Over time, the regional environmental emphasis had shifted towards the conservation of larger mammals, mainly big cats. The system of protected areas in the southwestern Primorye was particularly suited for these tasks. The total area of protected land with limited or prohibited access in the southwest of Primorye significantly exceeded the average regional standards, which significantly diminished the prospects of giving Khasansky Park a higher protection status (limits had been exhausted).

There has been a return to the concept of restoring the site within the Khasan-Tumen River Delta. The idea of including Khasansky Park within existing borders as a part of the Transboundary Ramsar Site seems plausible. However, it may transpire to be an ineffective and futile attempt since the status of Ramsar in Russian legislation is advisory rather than binding.

It was noted that the process of departmental reassignment for several protected areas had been initiated. In particular, the Far Eastern State Marine Biosphere Reserve, which has been under the jurisdiction of

the Russian Academy of Sciences since its foundation, has now been transferred to the Ministry of Natural Resources of the Russian Federation. There is also a possibility of merging the Khasansky Nature Park with the Far Eastern State Marine Biosphere Reserve or the Land of the Leopard National Park. The risk of complete abolition of the Khasansky Nature Park has not been excluded, but at minimum, it has introduced amendments to the regional legislative framework to allow for this possibility.

In general, the situation appears to have stagnated, and reinvigorated interest is required. Renewed interest could lead to the involvement of the Khasansky Nature Park with the cross-border Ramsar site or another protected area. Biological arguments outlining the importance of such an international approach to the conservation of the Tumen Delta are to be discussed in the later section.

Finding #12: Studies indicated the significant role of the Khasansky Nature Park in hosting various key bird species, including endangered species.

Research over the past 140 years has been devoted to birds in Southwestern Primorye, where the Khasan wetland is located. It has resulted in a wealth of publications, including several monographic summaries.[35] The report analyzes an extensive list of ornithological works (more than 50) published after the establishment of the Khasansky Nature Park.[36]

The main body of ornithological studies conducted over the last two decades on the Southwestern Primorye includes the following areas:

1) Faunistics, where studies generated an inventory of species composition, clarifying the nesting status of poorly studied and new species within the region;
2) Long-term monitoring of marine colonial birds' populations nesting on nearby islands in the marine reserve, which use coastal wetlands for foraging. This area of study has been well developed and covered in numerous publications; and
3) Specialised work on assessing the status of individual Red Data Book species (single-species studies). In this regard, the situation with the Black-faced spoonbill, Chinese egret, Baer's pochard, Reed parrotbill, and Japanese swamp warbler amongst others, is well studied, while there are still some "white spots". For example, there is no present monitoring of migrating waders, with the scale of their migration and their territory use still unknown. There is a large time gap between the data on migratory waterbirds (the last express inventory, carried out in 2005, is still unpublished). There is no data on the status of wintering waterfowls and sea colonial species in the water area adjacent to the park.

In general, the information from publications taken with the unpublished data from the Institute of Biology and Soil Sciences is sufficient reason to upgrade the current ornithological significance of the Khasansky Nature Park and to assess population trends, threats and prospects. A complete list of avian species, indicating their breeding and conservation status, is given in Annex III.[37]

[35] e.g. most recently Nazarenko et. al., 2016 and Glushchenko et al., 2016

[36] The format of summarizing papers does not always allow for a showcase of important information regarding a specific area of interest, so in this instance, this report will turn to primary sources.

[37] The order, volume, Russian and Latin names of taxa are given in accordance with the monograph (Nazarenko et al., 2016) and the taxonomic summary (The Howard and Moore's, 2014).

The Khasansky Nature Park is comprised of at least 285 species of bird fauna.[38] An overview of the species is detailed below:

1) This number composes more than half of the avifauna population for the entire Primorsky Territory – which is estimated to be approximately 505 species.[39]
2) Its fauna is represented by 51 families and is rather heterogeneous in an ecological and systematic sense (Table 7). The family with the most comprehensive representation is the 26 species of Anatidae (e.g. Ducks, Geese and Swans), 34 species of Charadriidae (e.g. Plovers Lapwings), 13 species of Scolopacidae (e.g. Sandpipers) and 7 species of Rallidae (e.g. Rails and Coots). These species are representatives of the wetland complex and form a massive bird background during the migration period but have rather poor representation during the nesting period (Annex III).
3) The basis of the summer population of water and near-water birds are 15 species of Ardeidae (e.g. Heron), 11 species of Laridae (e.g. Gulls and Terns) and 5 species of Podicipedidae (e.g. Grebes).
4) Nesting fauna is represented by the following categories:
    - 84 species breeding within the Park territory and 14 species nesting in nearby territories, including the Sea Islands, but regularly visiting the coastal plain for feeding purposes. Some of these species, for example, the Black-faced spoonbill and Chinese egret, are acutely dependent on the coastal wetlands since they have no other alternative land for foraging.
    - The vast majority of species (162) are seasonal migrants, 141 of which transit through the territory or make a stopover for up to several weeks to replenish fat reserves.
    - In addition to waders and waterfowl, this includes a large group of passerines associated with tree-shrub communities.
5) Of the non-nesting species, 21 species spend their summers here as vagrant birds or stay for molting. Finally, 25 species spend their winter here - these are mainly birds of prey. For the latter category, the territory of the Park is not critical for their survival, as it is just one of their many places for wintering.

Table 7. Family Diversity of the Avifauna of Khasansky Nature Park

№	Family name	species number
1	Accipitridae – Ястребиные, Kites, Hawks and Eagles	17
2	Acrocephalidae – Bush, Reed and Swamp Warblers	4
3	Aegithalidae – Ополовники, Long-tailed Tits	1
4	Alaudidae – Жаворонковые, Larks	1
5	Alcedinidae – Зимородковые, Kingfishers	1
6	Anatidae – Утиные, Ducks, Geese, Swans	26
7	Apodidae – Стрижиные, Swifts	1
8	Ardeidae – Цаплевые, Herons	15
9	Campephagidae – Личинкоедовые, Minivets and Cuckooshrikes	1
10	Caprimulgidae – Козодоевые, Nightjars	1
11	Certhiidae – Пищуховые, Treecreepers	1
12	Charadriidae – Ржанковые, Plovers & Lapwings	34

[38] It exceeds 300 species if accidental visitors are taken into account.
[39] Glushchenko, 2016

13	Ciconiidae – Аистовые, Storks	1
14	Columbidae – Голубиные, Pigeons	2
15	Coraciidae – Сизоворонковые, Rollers	1
16	Corvidae – Врановые, Crows and Jays	8
17	Cuculidae – Кукушковые, Cuckoos	3
18	Emberizidae – Овсянковые, Old World Buntings	13
19	Falconidae – Соколиные, Falcons and Caracaras	7
20	Fringillidae – Вьюрковые, Finches, Euphonias and Hawaiivan Honeycreepers	12
21	Gruidae – Журавлиные, Cranes	3
22	Haematopodidae – Кулики-сороки, Oystercatchers & Ibisbill	1
23	Hirundinidae – Ласточковые, Swallows	5
24	Laniidae – Сорокопутовые, Shrikes	4
25	Laridae – Чайковые, Gulls and Terns	11
26	Locustellidae – Сверчковые, Bush Warblers	5
27	Motacillidae – Трясогузковые, Wagtails and Pipits	14
28	Muscicapidae – Мухоловковые, Chats and Flycatchers	14
29	Oriolidae – Иволговые, Orioles, Figbirds and allies	1
30	Pandionidae – Скопиные, Osprey	1
31	Paridae – Синицевые, Tits, Chickadees	4
32	Passeridae – Воробьиные, Sparrows, Snowfinches and allies	1
33	Phalacrocoracidae – Баклановые, Cormorants	1
34	Phasianidae – Фазановые, Partridges, Pheasants, Grouse	2
35	Phylloscopidae – Пеночковые, Old World Leaf Warblers	8
36	Picidae – Дятловые, Woodpeckers	8
37	Plectrophenacidae – Подорожниковые, Longspurs	2
38	Podicipedidae – Поганковые, Grebes	5
39	Prunellidae – Завирушковые, Accentors	1
40	Rallidae – Пастушковые, Rails and Coots	7
41	Recurvirostridae – Шилоклювковые, Stilts and Avocets	1
42	Remizidae – Ремезовые, Penduline Tits	1
43	Scolopacidae – Бекасовые, Sandpipers	13
44	Scotocercidae – Bush Warblers and allies	2
45	Sittidae – Поползневые, Nuthatches, Spotted Creepers and Wallcreeper	1
46	Strigidae – Совиные, Owls	5
47	Sturnidae – Скворцовые, Starlings	3
48	Sylviidae – Славковые, Sylvia Warblers, Parrotbills and allies	2
49	Threskiornithidae - Ибисовые, Ibises	2
50	Turdidae – Дроздовые, Thrushes	4
51	Turnicidae – Трехперстковые, Buttonquails	1
52	Upupidae – Удодовые, Hoopoes	1
53	Zosteropidae – Белоглазковые, White-Eyes	1

The avian fauna of the Park represents several multidirectional population trends, reflecting global processes in populations. In particular, over the past 20–25 years, the species list has added 23 new species, including 13 new breeding species (Table 8). For some species, it was simply a matter of clarifying their status, but for other species, they were added as they were new to the region (e.g., new breeding species for the Russian Federation that have firmly settled in this region). These include the Little grebe, Chinese egret, Little egret, Black-faced spoonbill, American herring gull and Eastern penduline tit. These species are in the initial stages of expansion and are episodically breeding. However, the Yellow bittern, Chinese pond heron, Japanese swamp warbler, Indian cuckoo, Reed parrotbill and Red-billed starling are harder to detect. Their breeding patterns were suspected to be earlier within the calendar, which has been proven.[40]

Table 8. New Bird Species Added to the Avifaunistic List of the Khasansky Nature Park and Surrounding Territories Over the Past 20 years

English name	Scientific name	Russian name	New breeders	New regular visitors
1. Brent Goose Brant	*Branta bernicla nigricans* (Lawrence, 1846)	Черная казарка		*
2. Greater Flamingo	*Phoenicopterus roseus* (Pallas, 1811)	Розовый фламинго		*
3. Little Grebe	*Tachybaptus ruficollis poggei* (Reichenow, 1902)	Малая поганка	*	
4. Indian Cuckoo	*Cuculus micropterus micropterus* (Gould, 1838)	Индийская кукушка	*	
5. Ruddy-breasted Crake	*Zapornia fusca erythrothorax* (Temminck & Schlegel, 1849)	Красноногий погоныш	*	
6. Yellow Bittern	*Ixobrychus sinensis* (J.F. Gmelin, 1789)	Китайский волчок	*	
7. Chinese Pond Heron	*Ardeola bacchus* (Bonaparte, 1855)	Белокрылая цапля	*	
8. Little Egret	*Egretta garzetta garzetta* (Linnaeus, 1766)	Малая белая цапля	*	
9. Chinese Egret	*Egretta eulophotes* (Swinhoe, 1860)	Желтоклювая цапля	*	
10. Black-faced Spoonbill	*Platalea minor* (Temminck & Schlegel, 1849)	Малая колпица	*	
11. Grey-headed Lapwing	*Vanellus cinereus* (Blyth, 1842)	Серый чибис		*
12. Little Gull	*Hydrocoloeus minutus* (Pallas, 1776)	Малая чайка		*
13. Relict Gull	*Ichthyaetus relictus* (Lönnberg, 1931)	Реликтовая чайка		*
14. Great Black-headed Gull	*Ichthyaetus ichthyaetus* (Pallas, 1773)	Черноголовый хохотун		*

[40] Balatsky, 2015; Burkovsky et al., 2000, 2015; Gluschenko, Korobov, 2014, 2015; Glushchenko et al., 2015, 2016a, 2016b; Litvinenko, Shibaev, 1999a,b, 2011,2016; Sotnikov et al., 2016; and Shibaev, 2010, 2014

15. American Herring Gull	*Larus (smithsonianus) mongolicus* Sushkin, 1925	Монгольская чайка	*	
16. Black-capped Kingfisher	*Halcyon pileata* (Boddaert, 1783)	Ошейниковый зимородок		*
17. Blyth's Pipit	*Anthus godlewskii* (Taczanowski, 1876)	Конёк Годлевского		*
18. Eastern Penduline Tit	*Remiz consobrinus consobrinus* (Swinhoe, 1870)	Восточный ремез	*	
19. Japanese Swamp Warbler	*Locustella pryeri sinensis* (Witherby, 1912)	Японский сверчок	*	
20. Reed Parrotbill	*Paradoxornis heudei polivanovi* (Stepanyan, 1974)	Тростниковая сутора	*	
21. European Starling	*Sturnus vulgaris poltaratskyi* (Finsch, 1878)	Обыкновенный скворец		*
22. Rosy Starling	*Pastor roseus* (Linnaeus, 1758)	Розовый скворец		*
23. Red-billed Starling	*Spodiopsar sericeus* (J.F. Gmelin, 1789)	Красноклювый (шелковистый) скворец	*	

Some of the most significant losses have been the Baer's pochard and Falcated duck. the Baer's pochard is still sometimes recorded during the nesting period, however, with no signs of breeding. Any noticeable number of the Falcated duck dips during the spring migration (single-species flocks are composed of up to 200 ducks) and have a small population number during the summers without breeding.[41]

In general, the fauna of the Park is a somewhat lesser version of the shadow Site due to lacking a marine component (water area and shallow lagoons). If these habitats were added, it would add another 15 species of birds to the faunistic list and, more significantly, would bolster the Park's international importance rating as a wetland by regularly supporting at least 20,000 water birds. To satisfy this formal criterion, it would be sufficient to include the nearby Ptichya lagoon in the Park, which is analogous to shallow bays in terms of importance for water birds.

The Khasansky Nature Park includes 31 species from the IUCN Red List, including 7 endangered and 3 critically endangered species (Table 9), two of which are flagship species of NEASPEC (i.e. Black-faced Spoonbill and White-naped Crane). A brief overview of the status of globally protected species was presented below, for which the territory of Khasansky Nature Park is critical.

[41] Peklo, 2011; and Surmach et al., unpublished

Table 9. IUCN Red Listed Bird Species Presented at Khasansky Nature Park

№	Species	IUCN Status	Breeding species	Migrants and summer visitors	nests nearby and visits for food	Transient or stopover	Wintering species
1	Bewick's Swan	EN				*	
2	Swan Goose	VU				*	
3	Lesser White-fronted Goose	EN				*	
4	Baer's Pochard	CR	*				
5	Falcated Teal	NT		*			
6	Japanese Quail	NT	*				
7	Slavonian Grebe/Horned Grebe	VU				*	
8	Band-bellied Crake	NT	*				
9	White-naped Crane	VU				*	
10	Red-crowned Crane	EN				*	
11	Oriental White Stork	EN		*			
12	Chinese Egret	VU			*		
13	Black-faced Spoonbill	EN			*		
14	Eurasian Oystercatcher	VU				*	
15	Far Eastern Curlew	EN		*			
16	Black-tailed Godwit	NT				*	
17	Great Knot	EN				*	
18	Spoon-billed Sandpiper	CR				*	
19	Asian Dowitcher	NT				*	
20	Cinereous Vulture	NT					*
21	Hen Harrier/Northern Harrier	NT					*
22	Steller’s Sea Eagle	VU					*
23	Saker Falcon	EN					*
24	Pechora Pipit	VU				*	
25	Menzbier's Pipit	VU				*	
26	Japanese Reed Bunting/Ochre-rumped Bunting	NT	*				
27	Rustic Bunting	VU				*	
28	Yellow-breasted Bunting	CR				*	
29	Japanese Swamp Warbler	NT	*				
30	Manchurian Reed Warbler	VU	*				
31	Reed Parrotbill	NT	*				

Baer's pochard. Until the mid-1970s, at least 30–40 pairs nested between the Tumen River and the Expedition Bay on the fresh islands and brackish lagoons of the coastal plain. The Baer's pochard was one of the dominant species of nesting waterfowl, and by this metric, this wetland was the second most important coastal area after Lake Khanka. However, from the mid-1980s, nesting numbers plummeted and remained at a very low level until the beginning of the century (surveys of 1984, 1990, 1993 and 1995-98 counted only a few birds).[42] A special survey organized in 2014 as part of a coordinated survey revealed only 2 individual birds and a group of 3 birds with no signs of nesting.[43] For the last 5 years, there has been an absence of data on this species; however, a tiny population of this species may still survive. This plight is symptomatic of the spring hunt for waterfowls.

Falcated duck. Until recently, it was a common migratory rare breeding species of the area. Given the strong negative trend of its global population in recent decades, the state of this species during its southwestern migration to Primorye does not look so catastrophic. As before, the species is noticeably present among spring migrants. Single-species accumulations can reach up to 200 individuals.[44] Falcated ducks stay in the Khasansky park only for short periods due to hunting, but they remain at the nearby large Ptichya lagoon for at least one month until mid-May. This indicates the importance of this region for the species. However, in recent years, only individual non-breeding males have been found during the breeding period. The species does not form molting clusters either.

White-naped and Red-crowned cranes. For both species, the coastal wetlands are the most important stopover site during their spring migrations and also during autumn migrations for Red-crowned cranes. As shown by satellite tracking, this is the most important stopover point between the Korean wintering grounds and the breeding areas in the closest proximity of one another on Lake Khanka. Judging by the number of migrating birds, a significant portion of the Korean population flies through this territory. Further, the simultaneous accumulations of the two crane species reach 1,500 individuals. Cranes have actively used this territory from the second decade to the end of March, and it leaves 1-2 days after the beginning of the spring hunt (usually the last weekend of March). Hunting does not directly damage cranes, as no cases of poaching have been recorded in this territory, but it prevents nesting in this area. In the first half of the 20th century, the Tumen River Estuary was a component of the breeding range of the Red-crowned crane. There is no data on the breeding of the White-naped cranes on this matter. If spring wildfires were prevented, the territory has the potential to restore a small breeding group of Red-crowned and, possibly, White-naped cranes also. Practically speaking, the Hooded crane is not represented in this territory since the main migration routes lie outside of the Russian Federation.

Oriental white stork. It is the only rare migrating species in this area. In recent years, individual migrants and summering individuals were regularly observed. It is probably possible to attract further species for breeding by installing artificial nesting poles in Khasansky park.

Chinese egret and Black-faced spoonbill. Furugelm Island, located 7 km from the border of the Khasansky Park, possesses the only breeding colony of these species in the Russian Federation. The egret was first bred here in 1998. Until 2000, 35–40 pairs were regularly bred here, then the numbers steadily declined - 20 pairs bred on this island in 2006, and only 11 nests were found in 2014. It is believed that the reasons for the decline do not exist in the breeding colony, which is well guarded by the Far Eastern Marine

[42] Litvinenko and Shibaev, 1999
[43] Surmach and Shibaev, unpublished
[44] Data from 2014

Reserve, but in the absence of any real protection for the foraging land located on the shore. Up to 50% of the foraging area of the Chinese egret and Black-faced spoonbill is located within Khasansky Park. Aside from the Russian territories, the latter species actively visits the DPR Korea territory for feeding.[45] The Black-faced spoonbill is also a newcomer from the South China Sea to the Russian Federation and is extremely dependent on the status of coastal feeding areas. Currently, the colony numbers around a dozen breeding pairs and two dozen non-breeding individuals.[46] This species has no other alternative breeding sites within the Russian part; therefore, the territory under consideration is critically important.[47]

Spoon-billed sandpiper. The state of this species has not been specifically studied. However, judging by regular random encounters with individual birds and satellite tracking data (oral communication with the project coordinator), the sandy-silt shallows of Khasansky Park may be among the most important stopover sites for this extremely rare species.

Finding #13: The Khasansky Nature Park has been preserved in a relatively pristine form, with risks from grass wildfires, sea pollution and industrial development for the wetlands conservation.

The geographical location of the Park is in the almost uninhabited southwestern outskirts of the country, with limited citizen access to the territory. Furthermore, it's adjacent to the protected sea areas with almost complete absence of roads and any economic activities. This geographical location has allowed the wetland to be preserved in its relatively pristine form.

In addition, the risk that arose in the late 1990s of a radical transformation of the wetland in connection with the Tumen River Economic Development Area plans has now been largely eliminated, partly due to the creation of the Khasansky Nature Park and the inclusion of the wetland in the list of shadow Ramsar sites. Of all the planned infrastructure projects for the large-scale development of the region, only three have been implemented so far. These projects included the construction of a railway line, a road connection between the Russian village of Kraskino and the Chinese village of Hunchun, and the development of port infrastructure in Zarubino (the construction of a coal terminal). Based on studies by experts, none of them is expected to have a direct or indirect influence on the state of the wetland.

However, there are still a number of concerns regarding the Khasansky Nature Park and Khasan wetlands conservation, which include the following risks:

1) **Grass wildfires**. The regular negative anthropogenic influence with a serious impact on this and adjacent territories is grass wildfires. This permanent seasonal factor has a serious impact on the state of nesting avifauna, inhibiting the land-breeding bird species from further occupying this territory. However, it does not significantly affect the course of mass migrations and the summer use of the area by waterbirds and nearby water birds. Evidencing the relative well-being of this territory, one can point to a number of positive changes that have occurred in the avifauna of the Park over the past 20 years.
2) **Pollution of the sea and coastal lagoons**. The most urgent and current problem is the pollution of the sea and coastal lagoons, caused by the effluents of the Tumen River. The results of

[45] Unpublished satellite tracking data for 2016
[46] Shibaev, 2010
[47] Shibaev and Litvinenko, 1999 ab; Shibaev, 2010; and others

comprehensive studies undertaken in the late 1990s by the Far Eastern Branch of the Russian Academy of Sciences on the ecological conditions and the biota of the southwest part of Peter the Great Bay and the mouth of the Tumen River revealed serious problems with the content of the river flows. However, due to the powerful self-restoration processes in both marine and terrestrial ecosystems, the Tumen delta was categorized as unpolluted or slightly polluted, according to a number of key indicators. The recommended continuous monitoring of the situation has not yet been established, meaning present issues are still unknown. However, judging by indirect evidence, the situation has continued to worsen.

3) **Potential industrial development**. Another problem is the potential risk of a return to the long-standing idea of the industrial development of titanium-magnetite deposits in the territory adjacent to the southeastern tip of Khasansky Nature Park. This section of the sandy wall limits the flow of water from the coastal plain, thereby forming a wetland. This industrial development could be disastrous for the wetland. This site, unfortunately, was prudently not included in the Khasansky Nature Park.

4.3. Conservation and management systems

There are six strictly protected nature reserves of federal subordination in the Primorsky Territory. Two of them are located in the extreme southwest of the region (Figure 14, shown in red):

Figure 14. Conservation Zoning in the South-West of Primorsky Krai

- The Kedrovaya Pad Nature Reserve is currently part of the Land of the Leopard National Park as a strictly protected reserve;
- The Far Eastern Biosphere Marine Reserve, under the Russian Academy of Sciences, protects the marine ecosystems and consists of two clusters (south and north);
- Land of the Leopard National Park is a structure of Federal subordination. In addition to the main territory (dark green), it has an extensive buffer zone (light green); and
- Khasansky Nature Park (blue) is a Special Protected Area of prefectural subordination.

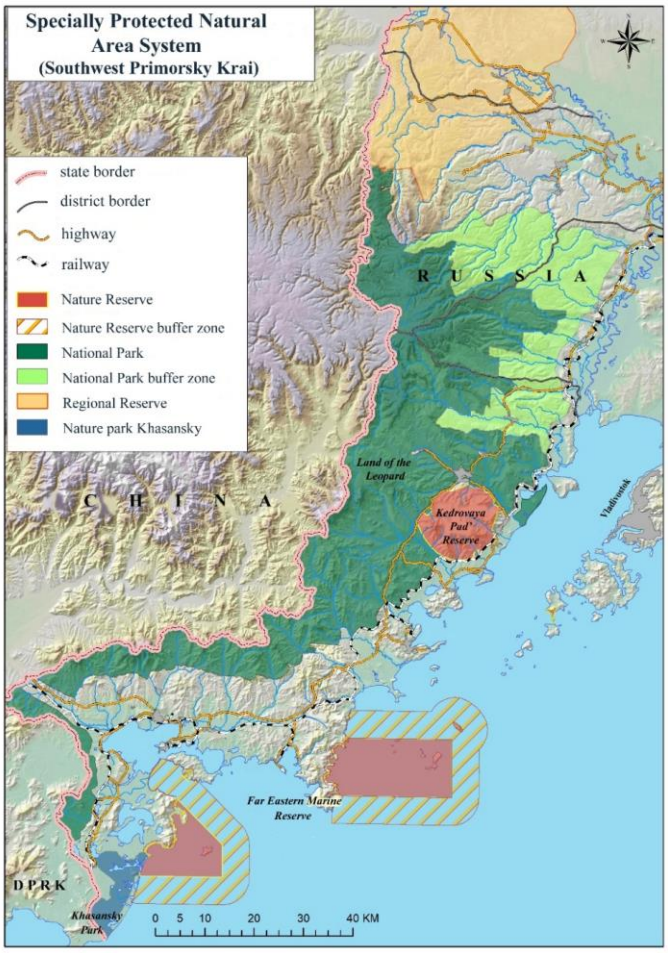
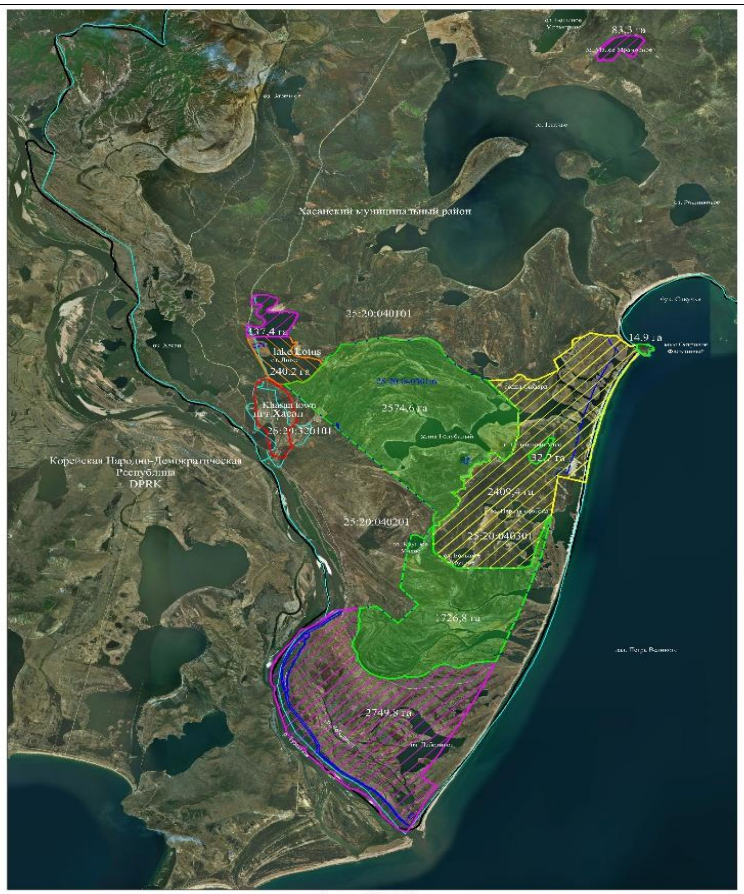


Figure 15. Conservation Zoning in the Khasansky Nature Park



Strict protected Area (2,970.50 ha)

Restricted Use Area (4,301.40 ha)

Educational tourism area (2,409.40 ha)

Area of intense recreational use (240.2 ha)

Reserve area (2,376.70 ha)

Total:

12,298.2 ha

Note: upon the Decree of the Administration of the Primorsky Territory No. 325-pas dated May 31, 2019

Table 10. Regulation of Permitted and Prohibited Activities in the Khasansky Nature Park

№	Area type	Area (ha)	Allowed	Prohibited
1	Protected Area	2,970.50	N/A	protected area with a complete prohibition of any recreational and all types of economic activities, including haying, grazing, laying new roads and linear structures, recreation and fishing
2	Restricted Use Area	4,301.40	implementation of sports and amateur hunting for waterfowls in accordance with the applicable legislation; and agricultural work	construction of facilities; felling of trees and shrubs (except for sanitary); storage and use of fertilizers and pesticides; and stray dogs
3	Educational tourism area	2,409.40	N/A	all types of legal hunting for wild animals and birds, as well as carrying firearms, crossbows, loops, traps, ammunition and other tools applicable to hunting or extraction of wildlife, with the exception of hunting in order to regulate the number of game resources; employees carrying service weapons while performing their official duties to protect the regime of the natural park; felling of trees and shrubs (except for sanitary); making bonfires outside equipped sites; construction of facilities not related to showing the sights of the territory (pavilions over archaeological sites, observation platforms, observation towers, etc.); and works causing a change in the landscape
4	Area of intense recreational use	240.20	N/A	transformation of large landforms and basic elements of the internal structure of the landscape; and allocation of land for individual construction
5	Reserve area	2,376.70	laying of ecological trails, fishing with a fishing rod, photo hunting, recreational loads are determined by the Directorate of the Protected Area based on scientifically established standards.	all types of hunting for wild animals and birds, as well as carrying firearms, crossbows, loops, traps, ammunition and other tools applicable to hunting or extraction of wildlife, with the exception of hunting in order to regulate the number of game resources; employees carrying service weapons while performing their official duties to protect the regime of the natural park; all types of logging; construction of new roads and linear structures; making bonfires outside equipped sites; replacement of soil; construction of structures not related to the maintenance of the regime of the natural park; and other economic activities causing a violation of the natural structure of the landscape
Note: upon the Decree of the Administration of the Primorsky Territory No. 325-pas dated May 31, 2019				

4.4. Conclusions

The territory of the Khasansky Nature Park, in comparison with the "Khasan-Tumen River Delta Shadow site", has lost some of the key components that characterize it as a wetland of international importance. However, for a number of parameters, it continues to comply with criteria for wetlands of international importance, namely in the frame of types of available wetlands (codes: E, F, G, M, O and P; Table 12) and also concerning a Special Criteria by species and ecological communities (codes: A1, B2 and B4; Table 11).

Some important biotopic losses of the Khasansky Nature Park compared to the "Khasan-Tumen River Delta" (Shadow Ramsar Site) can be compensated by Chinese and DPR Korean wetlands when the Park becomes part of a united cross-border Site (synergistic effect). The relevance and urgency of this step are dictated by the emerging and partially implemented processes of optimizing the management system of regional environmental policy.

Table 11. Compliance of the Territories under Consideration with Criteria for Wetlands of International Importance

Group	Description	Shadow Ramsar Site "Khasan-Tumen River Delta"	Khasansky Park	Comment concerning Khasansky Nature Park
A — Reference, rare or unique wetlands	1— It is an example of a reference, rare or unique for the corresponding biogeographic region, type of a wetland ecosystem and **is in a natural or near-natural state.**	**+**	**+**	Estimated as still in natural or near natural condition (description in Chapter 4.1) and unique for the Russian Far East
B — Wetlands of International Importance for the Conservation of Biological Diversity / Special criteria by species and ecological communities	2 — supports the existence of **vulnerable or endangered species** or communities.	**+**	**+**	31 of 285 recorded species are listed in the IUCN Red List. Two critically endangered species (Baer's pochard and Yellow-breasted bunting) have nearly disappeared at this site, but the condition of the habitats allows for the possibility of restoration of their populations. Other rare species are supported in varying degrees.
	3 — ensures the existence of populations of plants and / or animals that are of great importance for maintaining the biological diversity of the corresponding biogeographic region.	**+**	**???**	It supports 285 species of birds, including 84 nesting species. The distribution of a significant proportion of species is limited to the southern regions of Primorye, and they do not breed in the rest of the Russian Federation.
	4 — is the habitat of plant and / or animal species **at a critical stage of their**	**+**	**+**	It is the only and no other alternative feeding place for Black-faced spoonbill and Chinese egret. It's a

	biological cycle or provides shelter under adverse conditions.			very important spring stopover site for White-naped and Red-crowned cranes and up to 50 species of waders
	5. — a wetland could be considered internationally important if it regularly supports at least 20,000 waterbirds.	**+**	- **!!!**	Due to the exclusion of the sea water area and the biggest lagoon (Ptichya), Khasansky Park does not fulfill this requirement.

Table 12. List of Types of Wetlands According to the Ramsar Classification and Their Presence in the Territories Under Consideration

Type	**Description**	**"Khasan-Tumen River Delta" (Shadow Ramsar Site)**	**Khasansky Park**	**Comments (Park versus Shadow Site)**
A	permanent shallow sea areas less than 6 m deep at low tide, including sea bays and straits	+	-	Not represented
D	rocky coasts, including rocky coastal islands and cliffs	+	-	Very small areas - analogues of this type of habitat, are found on rocky buttes near the seacoast.
E	sand, shell and pebble coasts, including sand bars, spits and dune systems	+	+	Very limited areas, about 20% of Shadow site's corresponding biotopes
F	estuaries: permanent waters of estuaries and deltas	+	+	
G	intertidal mud, sand and saline surfaces	+	+	
H	intertidal marshes, including sea marshes, salt meadows, salt marshes, coastal salty and fresh marshes	+	**+**	Limited areas, about 50% of Shadow site's corresponding biotopes
M	permanent rivers, streams, creeks; including waterfalls	+	+	
O	permanent freshwater lakes (over 8 ha), including great oxbows.	+	+	The largest freshwater reservoir - lake. Lotosovoye (277.6 ha)
P	seasonal, temporary freshwater lakes (over 8 ha), including floodplain lakes.	+	+	
Q	Permanent saline / salsuginous / alkaline lakes	+	- **!!!**	

A remarkable feature of the Russian side is its conditions of wetlands conservation, which is estimated to be as close to its natural state, not only throughout the Park but also in the unprotected area adjacent to it. This is a success of the regional environmental policy, but also signals the general economic underdevelopment within the region. The territory of the Khasansky Nature Park, in contrast to the wetlands of the Tumen River Estuary in neighboring countries, is characterized by an extremely low population density and a complete absence of the agricultural industry.

On the one hand, these conditions are positive; but on the other hand, it carries negative connotations in terms of the significance of the territory for birds. It was found that agricultural fields adjacent to wetlands are much more attractive for many species of birds than wild wetlands in terms of food properties. Consequently, the Khasansky Nature Park is noticeably inferior to neighboring countries in terms of amassing gatherings of ducks and geese. On the contrary, the Russian territory plays a more significant role in supporting sea-related waterfowls (pochards, grebes and others), thanks to the vast protected water areas, due to the coastal sandy-silt shoals that are significantly larger than that of the DPR Korea habitats.

Only the Russian side of the Tumen River Estuary functions as a critical foraging landscape for the Black-faced spoonbill - a NEASPEC flagship species - as well as crucially providing its only nesting colony. Additionally, this area provides an important stopover place and a potential breeding site for another NEASPEC flagship species, the White-naped crane. The vast majority of cranes from the Korean-Japanese wintering grounds pass through this territory.

The fundamental obstacle for the Russian Federation to address is the long and ineradicable tradition of hunting waterfowl (poaching). The estuary part of the Tumen River is the second most important traditional hunting area after Lake Khanka, located 300 km to its north. This egregious behavior has existed for decades and seems unrealistic to be terminated due to powerful lobbying. The establishment of Khasansky Nature Park, with its prefectural status, does not prevent hunting but only partially regulates it. Spring hunting has a strong impact on the redistribution of waterfowl in the region during its migration, namely, shifting their gatherings to wetlands of neighboring countries. As a result, only sea-associated species have a large representation in the Russian side of the estuary.

Finally, Tumen River Estuary local ecotourism in the Russian Federation is inferior to that of DPR Korea and China. The main reasons may include: 1) a flat landscape with a lack of convenient viewing hills surrounding the most appealing reservoirs; 2) treacherous access to the wetlands due to a complete absence of roads and unsuitable water bodies to operate water-motor vehicles; 3) a complete lack of hotel infrastructure; 4) a low demand from domestic tourists; and 5) uncertain profitability for investors.

With the reviews in the report and pending further discussions, the Russian Federation may consider playing the role of a buffer zone of the future cross-border Ramsar Site in the Tumen River Estuary.

5. Recommendations towards transboundary cooperation in the Tumen River Estuary

The Tumen River and associated wetlands have its unique geographical features and ecosystem integrity to play important roles in regional sustainable development, wetlands conservation, trade, energy, transport and industry development.

However, socioeconomic development and environmental conservation pressures in the estuary region have increased (see section 3.2 Findings #2 to #4). One country cannot control the challenges such as deterioration of shared biodiversity, spatial fragmentation and loss of habitat, alternation of ecological process, desynchronized monitoring and uncoordinated management by its neighboring country.

It was also found that current conservation efforts are yet to be further coordinated and enhanced among the three countries. For example, Jingxin wetlands are tourism-targeted scenic parks and under the pressure of land conversion; Khasansky is part of the Far Eastern Specially Protected Natural Area System with missing gaps in between various protected area bodies; and Rason wetlands are bird reserve and Ramsar Site facing potential rapid economic development in upcoming future.

Another common challenge for China, DPR Korea and the Russian Federation is the different levels of management and financial capacity for wetland conservation. Noting both the Jingxin wetland and Khasan wetlands are administrated at the local level rather than the national level, sufficient support is required in terms of funding, human resources, capacity building in terms of establishing baseline data, monitoring, future projections, and knowledge of ecological process and conservation.

Furthermore, the development of the Tumen River Estuary is rapid and results in wetland use change. Under such development pressures, transboundary conservation of the shared ecosystems is necessary and urgent.

In this regard, the report suggests the following recommendations towards transboundary cooperation in the Tumen River Estuary between China, DPR Korea and the Russian Federation:

(1) To ensure higher-level attention (both domestic and international) and policy support to highlight the significance of the Jingxin Wetland and the Khasan Wetland conservation

- Enhance awareness through workshops, dialogues and seminars, at national, sub-national and local levels in China and the Russian Federation on the status and challenges of the wetlands conservation of the area; and
- Further enhance communications to higher-level management authorities (e.g. ministerial-level) and seek policy support and guidance for the development of transboundary cooperation in the area.

(2) To conduct joint scientific research by China, DPR Korea and the Russian Federation

- Conduct synchronized, regular waterbird survey and wetland inventory based on a standardized protocol;
- Carry out biotechnical measures to improve the attractiveness of the territory for rare and protected birds, for instance, by placing artificial nest constructions for breeding; and

- Jointly design a wetland area(s) for conservation, restoration and reconstruction based on the detailed information and management regulations for each wetland of China, DPR Korea and the Russian Federation

(3) To promote joint and strategic planning, coordinated monitoring and management plans

- Conduct a comprehensive stocktaking assessment of on-going transboundary projects that may do good or harm to the area, noting the unique geographical features of the Tumen River Estuary for transboundary transport, industrial development, ocean development and ecotourism development;
- Organize regular dialogues to develop strategic and coordinated planning for the area's environmental conservation and socioeconomic development;
- Prepare a joint monitoring system to formulate a feasible working plan for wetland conservation and management;
- Prepare a joint plan for sustainable use upon the conservation and restoration status;
- Develop a transboundary ecotourism plan;
- Promote information and data sharing by an established cooperation mechanism, especially on environmental risk early warning; and
- Ecologically restore fragmented or degraded wetlands with comprehensive treatment.

(4) To build capacity and raise awareness

- Enhance communication and training through trilateral Communication, Education and Public Awareness activities on conservation and management of wetlands (e.g., youth campaign on wetlands);
- Transboundary conservation workshop and site visit for local governments and international experts, with the participation of national government representatives;
- Develop a joint wetland cultural festival, such as goose festival or swan festival; and
- Establish a pilot programme for environmental education

(5) To broaden the network of partnerships and strengthen the international cooperation for the conservation of the Tumen River Estuary

- Consider the designation of a transboundary Ramsar site or another type of international wetland protected areas to promote integrated, coordinated wetland conservation and management; and
- Proactively reach out to potential partnering entities at international, regional and national levels, seeking their technical assistance and/or financial support for the conservation of the area, especially noting the challenges of insufficient funding faced by both the Jingxin Wetland and the Khasansky Nature Park.

Annex I

Bird Species and Their Numbers Recorded during the Field survey Bird Survey (Rason, 26-31 March 2014)

No.	Common Name	(North) Korean Name	Scientific Name	Status	26-28 Mar	29 Mar	30-31 Mar	Total	Habitat		Migration
									W: water bird	L: shallow water A: aquatic plant D: diver (deep water) T: tidal flat N sand or mud bar S: sea water	
									+	G: grass field P: rice paddies	
									F: forest bird	F: forest B: bush V: village R: raptor	
1	Hooded Crane	흰목검은두루미 (갯두루미)	*Grus monacha*	VU	0	1	0	1	W	L+A+P	M
2	White-naped Crane	재두루미	*Grus vipio*	VU	0	11	23	34	W	L+A+P	M
3	Taiga Bean Goose	큰부리큰기러기	*Anser fabalis*		15	20	40	75	W	L+A+P	M
4	Tundra Bean Goose	큰기러기	*Anser serrirostris*		10	115	450	575	W	L+A+P	M
5	Greater White-fronted Goose	쇠기러기	*Anseralbifrons*		460	250	250	600	W	L+P	M
6	Northern Pintail	가창오리	*Anasacuta*		170	20	400	570	W	L+P	M

7	Falcated Duck	붉은꼭두오리	*Anasfalcata*	NT, II	1,105	1,300	2,000	3,100	W	L+A	M
8	Eurasian Wigeon	알숭오리	*Anaspenelope*	II, HC	8,170	2,250	4,000	12,200	W	L+A	M
9	Mute Swan	혹고니	*Cygnus olor*	II, HC	106	P	P	106	W	L+A	M
10	American Wigeon	아메리카 홍머리오리	*Anasamericana*	FR	1	0	0	1	W	L+A	M
11	Whooper Swan	큰고니	*Cygnus cygnus*		303	10	P	315	W	L+A	M
12	Gadwall	알락오리	*Anasstrepera*		108	100	500	610	W	L+A	M
13	Relict Gull	고대갈매기	*Ichthyaetusrelictus*	VU, FR	0	0	5	5	W	L+T	M
14	Eurasian Spoonbill	누른빰저어새	*Platalealeucorodia*	FR	0	19	0	19	W	L+T	M
15	Great Knot	붉은어깨갯도요	*Calidristenuirostris*	VU	0	1	0	1	W	L+T	M
16	Baikal Teal	반달오리	*Anasformosa*	HC	30	130	235	350	W	L	M
17	Northern Shoveler	넙적부리오리	*Anasclypeata*		170	100	200	370	W	L	M
18	Garganey	알락발구지	*Anasquerquedula*		4	0	11	15	W	L	M
19	Eurasian Teal	되강오리	*Anascrecca*		225	200	500	750	W	L	M
20	Tufted Duck	흰죽지댕기오리	*Aythyafuligula*	II	440	2,900	4,000	4,650	W	D	M
21	Red-necked Grebe	붉은목농병아리	*Podicepsgrisegena*	HC	83	2	25	110	W	D	M
22	Common Pochard	흰죽지오리	*Aythyaferina*		515	1,100	500	2,100	W	D	M
23	Greater Scaup	흰죽지검은머리오리	*Aythyamarila*		2	60	100	160	W	D	M
24	Common Goldeneye	까치비오리	*Bucephalaclangula*		8	30	1,180	1,200	W	D	M
25	Smew	흰비오리	*Mergellusalbellus*		7	P	P	7	W	D	M

26	Far Eastern Curlew	알락꼬리마도요	*Numeniusmadagascariensis*	VU	0	1	0	4	W	T	M
27	Long-tailed Duck	바다꿩	*Clangulahyemalis*	VU, HC	246	P	140	390	W	S	M
28	Harlequin Duck	흰무늬오리	*Histrionicushistrionicus*		3	8	21	32	W	S	M
29	White-winged Scoter	흰눈섭검은오리	*Melanittadeglandi*		163	57	50	270	W	S	M
30	American Scoter	검은오리	*Melanittaamericana*		12	0	30	42	W	S	M
31	Red-throated Loon	붉은부리다마지	*Gaviastellata*		0	0	1	1	W	S	M
32	Arctic Loon	푸른목다마지	*Gaviaarctica*		0	0	1	1	W	S	M
33	Mallard	청둥오리	*Anasplatyrhynchos*		1,100	500	5,500	6,700	W	L+A+P	-
34	Eastern Spot-billed Duck	흰뺨검둥오리	*Anaszonorhyncha*		25	30	200	250	W	L+A+P	-
35	Northern Lapwing	댕기도요	*Vanellusvanellus*		0	0	50	50	W	G+L+T	-
36	Black-tailed Gull	개갈매기	*Laruscrassirostris*		20	75	75	170	W	S+T+L	-
37	Common Gull	갈매기	*Laruscanus*		15	75	100	190	W	S+T+L	-
38	Glaucous Gull	흰갈매기	*Larushyperboreus*		20	20	3	40	W	S+T+L	-
39	Vega Gull	재갈매기	*Larusvegae*		10	2	5	17	W	S+T+L	-
40	Mongolian Gull	노랑발갈매기	*Larusmongolicus*		40	30	100	150	W	S+T+L	-
41	Slaty-backed Gull	큰재갈매기	*Larusschistisagus*		3	1	1	5	W	S+T+L	-
42	Heuglin’s Gull	줄무늬 노랑발갈매기	*Larusheuglini*		2	1	0	4	W	S+T+L	-
43	Little Grebe	농병아리	*Tachybaptusruficollis*		1	0	0	1	W	L+D	-

44	Far Eastern Oystercatcher	까치도요	*Haematopusostraleguso sculans*		0	5	0	5	W	L+T	-
45	Black-crowned Night Heron	밤물까마귀	*Nycticoraxnycticorax*		0	1	0	1	W	L+G	-
46	Black-headed Gull	붉은부리갈매기	*Chroicocephalusridibundus*		35	100	100	230	W	L+S	-
47	Mandarin Duck	원앙새	*Aix galericulata*	II	86	48	5	135	W	L+F	-
48	Eurasian Coot	물닭	*Fulicaatra*		1,970	900	1,500	3,500	W	D+A	-
49	Red-breasted Merganser	바다비오리	*Mergusserrator*		38	200	625	850	W	D+S	-
50	Temminck's Cormorant	바다까마우지	*Phalacrocoraxcapillatus*		0	0	10	10	W	D+S	-
51	Grey Heron	왜가리	*Ardeacinerea*		20	70	35	110	W	L	-
52	Great Egret	대백로	*Ardea alba*		25	190	85	300	W	L	-
53	Spotted Redshank	학도요	*Tringaerythropus*		0	0	1	1	W	L	-
54	Common Redshank	붉은발도요	*Tringatotanus*		0	0	2	2	W	L	-
55	Common Merganser	(갯)비오리	*Mergus merganser*		33	100	100	230	W	D	-
56	Great Crested Grebe	뿔농병아리	*Podicepscristatus*		81	75	45	200	W	D	-
57	Black-necked Grebe	검은목농병아리	*Podicepsnigricollis*		31	3	0	34	W	D	-
58	Pelagic Cormorant	까막가마우지	*Phalacrocoraxpelagicus*		14	3	35	52	W	D	-
59	Great Cormorant	깻까마우지	*Phalacrocoraxcarbo*		50	350	200	450	W	D	-
60	Little Ringed Plover	알도요	*Charadriusdubius*		1	5	2	8	W	N	-
61	Kentish Plover	흰가슴알도요	*Charadriusalexandrinus*		0	2	0	2	W	N	-

62	Common Snipe	깍도요	*Gallinagogallinago*		0	4	0	4	W	N	-
63	Spectacled Guillemot	붉은발바다오리	*Cepphuscarbo*		1	0	10	11	W	S	-
64	Rook	떼까마귀	*Corvusfrugilegus*		0	100	0	100	F	F+B+G+P	-
65	Eurasian Magpie	까치	*Pica pica*		20	30	20	70	F	F+B+G+V	-
66	Carrion Crow	까마귀	*Corvuscorone*		0	2	0	2	F	F+B+G+V	-
67	Eurasian Jay	어치	*Garrulusglandarius*		0	1	0	1	F	F+B+G	-
68	Marsh Tit	쇠박새	*Poecilepalustris*		0	0	3	3	F	F+B	-
69	Coal Tit	깨새	*Periparusater*		0	0	5	5	F	F+B	-
70	Siberian Accentor	떪종다리	*Prunellamontanella*		1	0	2	3	F	F+B	-
71	Ochre-rumped Bunting	검은머리멧새	*Emberizayessoensis*	NT	0	0	2	2	F	G+B	-
72	Red-billed Starling	붉은부리찌르레기	*Spodiopsarsericeus*		0	3	0	3	F	G+B	-
73	White-cheeked Starling	찌르러기	*Spodiopsarcineraceus*		2	7	0	9	F	G+B	-
74	Common Starling	흰점찌르러기	*Sturnus vulgaris*		0	3	0	3	F	G+B	-
75	Dusky Thrush	개똥지빠귀	*Turduseunomus*		0	4	1	5	F	G+B	-
76	Meadow Bunting	멧새	*Emberizacioides*		10	10	5	25	F	G+B	-
77	Rustic Bunting	뿔멧새	*Emberizarustica*		5	250	5	260	F	G+B	-
78	Yellow-throated Bunting	노랑떡멧새	*Emberizaelegans*		8	10	5	23	F	G+B	-
79	Black-faced Bunting	버들멧새	*Emberizaspodocephala*		0	1	0	1	F	G+B	-
80	Pallas's Reed Bunting	북떪멧새	*Emberizapallasi*		0	1	0	1	F	G+B	-
81	Common Reed Bunting	큰검은머리멧새	*Emberizaschoeniclus*		0	0	1	1	F	G+B	-

82	Common Pheasant	꿩	*Phasianus colchicus*		15	10	10	35	F	G+B	-
83	Eurasian Tree Sparrow	참새	*Passer montanus*		75	200	50	325	F	B+V	-
84	White Wagtail	알락할미새	*Motacilla alba*		5	8	4	17	F	M+B	-
85	Hill Pigeon	낭비둘기	*Columba rupestris*		0	0	2	2	F	F	-
86	Oriental Turtle Dove	떪비둘기	*Streptopeliaorientalis*		5	10	2	17	F	F	-
87	Great Spotted Woodpecker	알락딱따구리(오색더구리)	*Dendrocopos major*		0	1	1	2	F	F	-
88	Grey-headed Woodpecker	푸른딱따구리(청더구리)	*Picuscanus*		1	0	0	1	F	F	-
89	Goldcrest	금상모박새	*Regulusregulus*		2	0	5	7	F	F	-
90	Chinese Nuthatch	쇠동고비	*Sittavillosa*		0	0	6	6	F	F	-
91	Eastern Great Tit	박새	*Parus minor*		2	0	6	8	F	B	-
92	Vinous-throated Parrotbill	부비새	*Sinosutherawebbiana*		10	10	10	30	F	B	-
93	Naumann's Thrush	티티새	*Turdusnaumanni*		1	2	1	4	F	B	-
94	Daurian Redstart	딱새	*Phoenicurusauroreus*		0	1	0	1	F	B	-
95	Bull-headed Shrike	개구마리	*Laniusbucephalus*		1	1	1	3	F	B	-
96	Long-tailed Shrike	긴꼬리때까치	*Laniusschach*					1?	F	B	-
97	Chinese Grey Shrike	물개구마리	*Laniussphenocercus*		1	2	0	3	F	B	-
98	Brambling	꽃참새	*Fringillamontifringilla*		1	0	14	15	F	B	-
99	Long-tailed Rosefinch	긴꼬리양지니	*Carpodacussibiricus*		1	0	0	1	F	B	-
100	Pallas's Rosefinch	양지니	*Carpodacusroseus*		0	0	1	1	F	B	-

101	Grey-capped Greenfinch	방울새	*Chlorissinica*		25	20	20	65	F	B	-
102	Common Redpoll	붉은방울새	*Acanthisflammea*		0	1	0	1	F	B	-
103	Eurasian Siskin	검은머리방울새	*Spinusspinus*		1	1	3	5	F	B	-
104	Japanese Quail	메추리	*Coturnix japonica*	NT	1	2	0	3	F	G	-
105	Eurasian Skylark	종다리	*Alaudaarvensis*		15	20	25	60	F	G	-
106	Far Eastern Skylark	극동종다리	*Alauda japonica*		5	15	20	40	F	G	-
107	Eurasian Hoopoe	후투디	*Upupaepops*		1	1	0	1	F	G	-
108	Eurasian Sparrow hawk	큰새매	*Accipiter nisus*		0	0	1	1	F	R	-
109	White-tailed Eagle	흰꼬리수리	*Haliaeetusalbicilla*		0	2	0	2	F	R	-
110	Common Kestrel	조롱이	*Falco tinnunculus*		0	0	2	2	F	R	-
111	Peregrine Falcon	꿩매	*Falco peregrinus*		1	0	1	2	F	R	-
									W: 63 F: 48		

Notes

II= Internationally Important (based on Wetlands International 2014 and Ramsar Convention waterbird criteria for the identification of internationally important wetlands); HC = likely to be the highest count of this species in the DPR Korea based on a limited literature search; FR = likely to be a first record of this species for the DPR Korea based on Tomek (1999-2002) and on a limited literature search.

1. Order and Nomenclature from Birds Korea (2013).
2. Under status, NT (globally Near-threatened) and VU (globally Vulnerable) follow BirdLife International (2014);
3. In count rows, “P” indicates Present but not counted.

Annex II

Wetland Birds Found in Jingxin Wetland Area[48]

English name	Scientific name	Chinese name	Conservation level in China	Status IUCN
Bewick's Swan	Cygnus bewickii Yarrell, 1830	小天鹅	2	EN
Swan Goose	Anser cygnoid (Linnaeus, 1758)	鸿雁	2	VU
Greater White-fronted Goose	Anser albifrons	白额雁	1	LC
Bean Goose	Anser fabalis	豆雁		LC
Common Merganser	Mergus merganser	普通秋沙鸭		LC
Scaly-sided Merganser	Mergus squamatus	中华秋沙鸭	1	EN
Smew	Mergellus albellus	班头秋沙鸭		LC
Red-breasted Merganser	Mergus serrator Linnaeus, 1758	红胸秋沙鸭		NT
Common Pochard	Aythya ferina (Linnaeus, 1758)	红头潜鸭		VU
Baer's Pochard	Aythya baeri (Radde, 1863)	青头潜鸭		CR
Greater Scaup	Aythya marila nearctica (Stejneger, 1885)	斑背潜鸭		VU
Tufted Duck	Aythya fuligula	凤头潜鸭		LC
Common Goldeneye	Bucephala clangula	鹊鸭		LC
Mallard	Anas platyrhynchos	绿头鸭		LC
Falcated Teal	Mareca falcata (Georgi, 1775)	罗纹鸭		NT
Green-winged Teal	Anas crecca	绿翅鸭		LC
Gadwall	Mareca strepera	赤膀鸭		LC
Eastern Spot-billed Duck	Anas zonorhyncha	斑嘴鸭		LC
Northern Shoveler	Spatula clypeata	琵嘴鸭		LC
Northern Pintail	Anas acuta	针尾鸭		LC
Garganey	Spatula querquedula	白眉鸭		LC
Eurasian Wigeon	Mareca penelope	赤颈鸭		LC
Mandarin Duck	Aix galericulata	鸳鸯	2	LC

[48] based on the Hunchun nature reserve record

Japanese Quail	Coturnix japonica Temminck & Schlegel, 1849	鹌鹑		NT
Slavonian Grebe/Horned Grebe	Podiceps auritus auritus (Linnaeus, 1758)	角䴙䴘		VU
Little Grebe	Tachybaptus ruficollis	小䴙䴘		LC
Great Crested Grebe	Podiceps cristatus	凤头䴙䴘		LC
Great Cormorant	Phalacrocorax carbo	普通鸬鹚		LC
White-naped Crane	Antigone vipio (Pallas, 1811)	白枕鹤		VU
Red-crowned Crane	Grus japonensis viridirostris Vieillot, 1823	丹顶鹤		EN
Hooded Crane	Grus monacha Temminck, 1835	白头鹤		VU
Oriental White Stork	Ciconia boyciana Swinhoe, 1873	白鹳		EN
Eurasian Spoonbill	Platalea leucorodia	白琵鹭	2	LC
Great Egret	Ardea alba	大白鹭		LC
Little Egret	Egretta garzetta	白鹭		LC
Grey Heron	Ardea cinerea	苍鹭		LC
Purple Heron	Ardea purpurea	草鹭		LC
Cattle Egret	Bubulcus ibis	牛背鹭		LC
Eurasian Oystercatcher	Haematopus ostralegus osculans Swinhoe, 1871	蛎鹬		VU
Von Schrenck's Bittern	Ixobrychus eurhythmus	紫背苇鳽		LC
Northern Lapwing	Vanellus vanellus (Linnaeus, 1758)	凤头麦鸡		VU
Grey-headed Lapwing	Vanellus cinereus	灰头麦鸡		LC
Little Ringed Plover	Charadrius dubius	金眶鸻		LC
Black-neck Stilt	Himantopus mexicanus	黑颈长脚鹬		LC
Green Sandpiper	Tringa ochropus	白腰草鹬		LC
Common Greenshank	Tringa nebularia	青脚鹬		LC
Eurasian Curlew	Numenius arquata orientalis C.L. Brehm, 1831	白腰杓鹬		VU
Far Eastern Curlew	Numenius madagascariensis (Linnaeus, 1766)	大杓鹬		EN

Eurasian Woodcock	Scolopax rusticola	丘鹬		LC
Pintail Snipe	Gallinago stenura	针尾沙锥		LC
Asian Dowitcher	Limnodromus semipalmatus (Blyth, 1848)	半蹼鹬		NT
Black-headed Gull	Chroicocephalus ridibundus	红嘴鸥		LC
Black-tailed Gull	Larus crassirostris	黑尾鸥		LC
Slaty-backed Gull	Larus schistisagus	灰背鸥		LC
Siberian Gull	Larus smithsonianus	西伯利亚银鸥		LC
Mew Gull	Larus canus	普通海鸥		LC
Common Tern	Sterna hirundo	普通燕鸥		LC
Common Coot	Fulica atra	白骨顶		LC
Common Moorhen	Gallinula chloropus	黑水鸡		LC
Osprey	Pandion haliaetus	鹗	二级	LC
Cinereous Vulture	Aegypius monachus (Linnaeus, 1766)	秃鹫	二级	NT
Golden Eagle	Aquila chrysaetos	金雕	一级	LC
Steller’s Sea Eagle	Haliaeetus pelagicus (Pallas, 1811)	虎头海雕	一级	VU
White-tailed Sea Eagle	Haliaeetus albicilla	白尾海雕	一级	LC
Brown Shrike	Lanius cristatus	红尾伯劳		LC
Great Grey Shrike	Lanius excubitor	灰伯劳		LC
Chinese Gray Shrike	Lanius sphenocercus	楔尾伯劳		LC
Common Kingfisher	Alcedo atthis bengalensis J.F. Gmelin, 1788	普通翠鸟		VU
Saker Falcon	Falco cherrug milvipes Jerdon, 1871	猎隼		EN
Rustic Bunting	Ocyris rusticus (Pallas, 1776)	田鹀		VU
Yellow-breasted Bunting	Ocyris aureolus ornatus (Shulpin, 1928)	黄胸鹀		CR

Annex III

A complete list of avian species in Khasansky Nature Park

Scientific name	Russian name	Status IUCN	Breeding species	Migrants and summer visitors	Nests nearby and visits for food	Transient or stopover	Wintering species
Cygnus bewickii Yarrell, 1830	Малый лебедь	EN				*	
Cygnus cygnus (Linnaeus, 1758)	Лебедь-кликун	LC				*	
Anser cygnoid (Linnaeus, 1758)	Сухонос	VU				*	
Anser fabalis Gould, 1852	Гуменник	LC				*	
Anser albifrons albifrons (Scopoli, 1769)	Белолобый гусь	LC				*	
Anser erythropus (Linnaeus, 1758)	Пискулька	EN				*	
Bucephala clangula clangula (Linnaeus, 1758)	Обыкновенный гоголь	LC				*	
Mergellus albellus (Linnaeus, 1758)	Луток	LC				*	
Mergus merganser merganser Linnaeus, 1758	Большой крохаль	LC				*	
Mergus serrator Linnaeus, 1758	Длинноносый крохаль	NT				*	
Histrionicus histrionicus pacificus W.S. Brooks, 1915	Каменушка	LC				*	
Aythya ferina (Linnaeus, 1758)	Красноголовый нырок	VU		*			
Aythya baeri (Radde, 1863)	Бэров нырок	CR	*				
Aythya fuligula (Linnaeus, 1758)	Хохлатая чернеть	LC				*	
Aythya marila nearctica (Stejneger, 1885)	Морская чернеть	VU				*	
Spatula querquedula (Linnaeus, 1758)	Чирок-трескунок	LC	*				
Spatula clypeata (Linnaeus, 1758)	Широконоска	LC		*			

Sibirionetta formosa (Georgi, 1775)	Клоктун	LC				*	
Mareca falcata (Georgi, 1775)	Касатка	NT		*			
Mareca strepera strepera (Linnaeus, 1758)	Серая утка	LC				*	
Mareca penelope (Linnaeus, 1758)	Свиязь	LC				*	
Anas zonorhyncha Swinhoe, 1866	Черная кряква	LC	*				
Anas platyrhynchos platyrhynchos Linnaeus, 1758	Кряква	LC	*				
Anas acuta Linnaeus, 1758	Шилохвость	LC				*	
Anas crecca crecca Linnaeus, 1758	Чирок-свистунок	LC		*			
Aix galericulata (Linnaeus, 1758)	Мандаринка	LC		*			
Coturnix japonica Temminck & Schlegel, 1849	Японский перепел	NT	*				
Phasianus colchicus pallasi Rothschild, 1903	Фазан	LC	*				
Tachybaptus ruficollis poggei (Reichenow, 1902)	Малая поганка	LC	*				
Podiceps grisegena holbollii Reinhardt, 1854	Серощёкая поганка	LC	*				
Podiceps cristatus cristatus (Linnaeus, 1758)	Большая поганка, или чомга	LC	*				
Podiceps auritus auritus (Linnaeus, 1758)	Красношейная поганка	VU				*	
Podiceps nigricollis nigricollis C.L.Brehm, 1831	Черношейная поганка	LC		*			
Columba rupestris rupestris Pallas, 1811	Скалистый голубь	LC	*				
Streptopelia orientalis orientalis (Latham, 1790)	Большая горлица	LC	*				
Caprimulgus indicus jotaka Temminck & Schlegel, 1844	Большой козодой	LC	*				

Apus pacificus pacificus (Latham, 1801)	Белопоясный стриж	LC	*				
Cuculus micropterus micropterus Gould, 1838	Индийская кукушка	LC	*				
Cuculus canorus canorus Linnaeus, 1758	Обыкновенная кукушка	LC	*				
Cuculus poliocephalus Latham, 1790	Малая кукушка	LC	*				
Rallus indicus Blyth, 1849	Пастушок	LC	*				
Zapornia fusca erythrothorax (Temminck & Schlegel, 1849)	Красноногий погоныш	LC	*				
Zapornia paykullii (Ljungh, 1813)	Большой погоныш	NT	*				
Zapornia pusilla pusilla (Pallas, 1776)	Погоныш-крошка	LC	*				
Amaurornis phoenicurus phoenicurus (Pennant, 1769)	Белогрудый погоныш	LC	*				
Gallinula chloropus chloropus (Linnaeus, 1758)	Камышница	LC	*				
Fulica atra atra Linnaeus, 1758	Лысуха	LC	*				
Antigone vipio (Pallas, 1811)	Даурский журавль	VU				*	
Grus japonensis viridirostris Vieillot, 1823	Японский журавль	EN				*	
Grus monacha Temminck, 1835	Черный журавль	VU				*	
Ciconia boyciana Swinhoe, 1873	Дальневосточный аист	EN		*			
Botaurus stellaris stellaris (Linnaeus, 1758)	Большая выпь	LC	*				
Ixobrychus sinensis (J.F. Gmelin, 1789)	Китайский волчок	LC	*				
Ixobrychus eurhythmus (Swinhoe, 1873)	Амурский волчок	LC	*				
Ixobrychus cinnamomeus (J.F. Gmelin, 1789)	Охристый волчок	LC		*			
Nycticorax nycticorax nycricorax (Linnaeus, 1758)	Кваква	LC				*	

Butorides striata amurensis (von Schrenck, 1860)	Зеленая кваква	LC	*				
Ardeola bacchus (Bonaparte, 1855)	Белокрылая цапля	LC		*			
Bubulcus ibis coromandus (Boddaert, 1783)	Египетская цапля	LC		*			
Ardea cinerea jouyi A.H. Clark, 1907	Серая цапля	LC			*		
Ardea purpurea manilensis Meyen, 1834	Рыжая цапля	LC				*	
Ardea alba alba Linnaeus, 1758	Большая белая цапля	LC		*			
Ardea modesta J.E. Gray, 1831	Южная белая цапля	LC		*			
Ardea intermedia intermedia Wagler, 1829	Средняя белая цапля	LC		*			
Egretta garzetta garzetta (Linnaeus, 1766)	Малая белая цапля	LC			*		
Egretta eulophotes (Swinhoe, 1860)	Желтоклювая цапля	VU			*		
Platalea leucorodia leucorodia Linnaeus, 1758	Колпица	LC		*			
Platalea minor Temminck & Schlegel, 1849	Малая колпица	EN			*		
Phalacrocorax carbo sinensis (Staunton, 1796)	Большой баклан	LC			*		
Haematopus ostralegus osculans Swinhoe, 1871	Кулик-сорока	VU				*	
Himantopus himantopus himantopus (Linnaeus, 1758)	Ходулочник	LC		*			
Pluvialis squatarola squatarola (Linnaeus, 1758)	Тулес	LC				*	
Pluvialis fulva (J.F. Gmelin, 1789)	Бурокрылая ржанка	LC				*	
Charadrius hiaticula tundrae (P.R. Lowe, 1915)	Галстучник	LC				*	

Charadrius dubius curonicus J.F. Gmelin, 1789	Малый зуек	LC	*				
Charadrius alexandrinus dealbatus (Swinhoe, 1870)	Морской зуек	LC	*				
Charadrius mongolus mongolus Pallas, 1776	Монгольский зуек	LC				*	
Charadrius leschenaultii leschenaultii Lesson, 1826	Толстоклювый зуек	LC				*	
Vanellus vanellus (Linnaeus, 1758)	Чибис	VU	*				
Vanellus cinereus (Blyth, 1842)	Серый чибис	LC		*			
Numenius phaeopus variegatus (Scopoli, 1786)	Средний кроншнеп	LC				*	
Numenius minutus Gould, 1842	Кроншнеп-малютка	LC				*	
Numenius arquata orientalis C.L. Brehm, 1831	Большой кроншнеп	VU				*	
Numenius madagascariensis (Linnaeus, 1766)	Дальневосточный кроншнеп	EN		*			
Limosa lapponica menzbieri Portenko, 1936	Малый веретенник	LC				*	
Limosa limosa melanuroides Gould, 1846	Большой веретенник	NT				*	
A. i. oahuensis (Bloxham, 1826)	Камнешарка	LC				*	
Calidris tenuirostris (Horsfield, 1821)	Большой песочник	EN				*	
Calidris canutus rogersi (Mathews, 1913)	Исландский песочник	LC				*	
Calidris (Philomachus) pugnax (Linnaeus, 1758)	Турухтан	LC				*	
Calidris falcinellus sibirica (Dresser, 1876)	Грязовик	LC				*	
Calidris acuminata (Horsfield, 1821)	Острохвостый песочник	LC				*	
Calidris ferruginea (Pontoppidan, 1763)	Краснозобик	NT				*	

Calidris temminckii (Leisler, 1812)	Белохвостый песочник	LC				*	
Calidris subminuta (von Middendorff, 1853)	Длиннопалый песочник	LC				*	
Calidris (Eurynorhynchus) pygmea (Linnaeus, 1758)	Лопатень	CR				*	
Calidris ruficollis (Pallas, 1776)	Песочник-красношейка	NT				*	
Calidris alba rubida (J.F. Gmelin, 1789)	Песчанка	LC				*	
Calidris alpina sakhalina (Vieillot, 1816)	Чернозобик	LC				*	
Calidris (Tringites) subruficollis (Vieillot, 1819)	Желтозобик	NT				*	
Calidris melanotos (Vieillot, 1819)	Дутыш	LC				*	
Limnodromus semipalmatus (Blyth, 1848)	Азиатский бекасовидный веретенник	NT				*	
Scolopax rusticola Linnaeus, 1758	Вальдшнеп	LC				*	
Gallinago solitaria japonica (Bonaparte, 1856)	Горный дупель	LC					*
Gallinago hardwickii (J.E. Gray, 1831)	Японский бекас	LC				*	
Gallinago stenura (Bonaparte, 1831)	Азиатский бекас	LC				*	
Gallinago megala Swinhoe, 1861	Лесной дупель	LC				*	
Gallinago gallinago gallinago (Linnaeus, 1758)	Бекас	LC				*	
Xenus cinereus (Güldenstädt, 1775)	Мородунка	LC				*	
Actitis hypoleucos (Linnaeus, 1758)	Перевозчик	LC	*				
Tringa ochropus Linnaeus, 1758	Черныш	LC				*	
Tringa brevipes (Vieillot, 1816)	Сибирский пепельный улит	NT				*	

Tringa erythropus (Pallas, 1764)	Щеголь	LC				*	
Tringa nebularia (Gunnerus, 1767)	Большой улит	LC				*	
Tringa totanus ussuriensis Buturlin, 1934	Травник	LC	*				
Tringa glareola Linnaeus, 1758	Фифи	LC				*	
Tringa stagnatilis (Bechstein, 1803)	Поручейник	LC				*	
Phalaropus lobatus (Linnaeus, 1758)	Круглоносый плавунчик	LC				*	
Turnix tanki blanfordii Blyth, 1863	Пятнистая трехперстка	LC	*				
Chroicocephalus ridibundus (Linnaeus, 1766)	Озерная чайка	LC	*				
Larus crassirostris Vieillot, 1818	Чернохвостая чайка	LC			*		
Larus canus kamtschatkensis Bonaparte, 1857	Сизая чайка	LC				*	
Larus fuscus heuglini Bree, 1876	Халей/Восточная клуша	LC				*	
Larus (smithsonianus) mongolicus Sushkin, 1925	Монгольская чайка	LC			*		
Larus schistisagus Stejneger, 1884	Тихоокеанская чайка	LC			*		
Larus hyperboreus pallidissimus Portenko, 1939	Бургомистр	LC		*			
Sternula albifrons sinensis (J.F. Gmelin, 1789)	Малая крачка	LC				*	
Chlidonias hybrida hybrida (Pallas, 1811)	Белощекая крачка	LC				*	
Chlidonias leucopterus (Temminck, 1815)	Белокрылая крачка	LC				*	
Sterna hirundo longipennis Nordmann, 1835	Речная крачка	LC	*				
Pandion haliaetus haliaetus (Linnaeus, 1758)	Скопа	LC			*		

Pernis ptilorhynchus orientalis Taczanowski, 1891	Хохлатый осоед	LC				*	
Aegypius monachus (Linnaeus, 1766)	Черный/Серый гриф	NT					*
Aquila chrysaetos japonica Severtzov, 1888	Беркут	LC					*
Circus spilonotus spilonotus Kaup, 1847	Восточный болотный лунь	LC		*			
Circus cyaneus cyaneus (Linnaeus, 1766)	Полевой лунь	NT					*
Circus melanoleucos (Pennant, 1769)	Пегий лунь	LC	*				
Accipiter soloensis (Horsfield, 1821)	Короткопалый ястреб	LC				*	
Accipiter gularis gularis (Temminck & Schlegel, 1844)	Малый перепелятник	LC				*	
Accipiter nisus nisosimilis (Tickell, 1833)	Перепелятник	LC			*		
Accipiter gentilis albidus (Menzbier, 1882)	Тетеревятник	LC			*		
Haliaeetus albicilla albicilla (Linnaeus, 1758)	Орлан-белохвост	LC					*
Haliaeetus pelagicus (Pallas, 1811)	Белоплечий орлан	VU					*
Milvus migrans lineatus (J.E. Gray, 1831)	Черный коршун	LC				*	
Butastur indicus (J.F. Gmelin, 1788)	Ястребиный сарыч	LC			*		
Buteo lagopus menzbieri Dementiev, 1951	Зимняк	LC					*
Buteo japonicus japonicus (Temminck & Schlegel, 1844)	Японский канюк	LC					*
Buteo hemilasius Temminck & Schlegel, 1844	Мохноногий курганник	LC					*
Ninox japonica florensis (Wallace, 1864)	Иглоногая сова	LC				*	
Asio otus otus (Linnaeus, 1758)	Ушастая сова	LC	*				

Asio flammeus flammeus (Pontoppidan, 1763)	Болотная сова	LC					*
Strix uralensis nikolskii (Buturlin, 1907)	Длиннохвостая неясыть	LC					*
Bubo bubo ussuriensis Poliakov, 1915	Филин	LC	*				
Upupa epops epops Linnaeus, 1758	Удод	LC	*				
Jynx torquilla chinensis Hesse, 1911	Вертишейка	LC	*				
Picus canus jessoensis Stejneger, 1886	Седой дятел	LC	*				
Dryocopus martius martius (Linnaeus, 1758)	Желна	LC				*	
Dendrocopos kizuki permutatus (Meise, 1934)	Малый острокрылый дятел	LC				*	
Dendrocopos minor amurensis (Buturlin, 1908)	Малый пестрый дятел	LC	*				
Dendrocopos leucotos sinicus Buturlin, 1907	Белоспинный дятел	LC	*				
Dendrocopos major japonicus (Seebohm, 1883)	Большой пестрый дятел	LC				*	
Dendrocopos (Hypopicus) hyperythrus subrufinus (Cabanis & Heine, 1863)	Рыжебрюхий дятел	LC				*	
Eurystomus orientalis cyanicollis Vieillot, 1819	Восточный широкорот	LC				*	
Alcedo atthis bengalensis J.F. Gmelin, 1788	Обыкновенный зимородок	VU	*				
Falco tinnunculus interstinctus McClelland, 1840	Обыкновенная пустельга	LC	*				
Falco amurensis Radde, 1863	Амурский кобчик	LC				*	
Falco columbarius insignis (A.H. Clark, 1907)	Дербник	LC					*

Falco subbuteo subbuteo Linnaeus, 1758	Чеглок	LC			*		
Falco cherrug milvipes Jerdon, 1871	Балобан	EN					*
Falco rusticolus Linnaeus, 1758	Кречет	LC					*
Falco peregrinus japonensis J.F. Gmelin, 1788	Сапсан	LC			*		
Pericrocotus divaricatus Raffles, 1822	Личинкоед	LC					*
Oriolus chinensis diffusus Sharpe, 1877	Китайская иволга	LC					*
Lanius tigrinus Drapiez, 1828	Тигровый сорокопут	LC				*	
Lanius cristatus confusus Stegmann, 1929	Сибирский жулан	LC	*				
Lanius sphenocercus Cabanis, 1873	Клинохвостый сорокопут	LC	*				
Lanius borealis sibiricus Bogdanov, 1881	Северный сорокопут	LC					*
Cyanopica cyanus cyanus (Pallas, 1776)	Голубая сорока	LC				*	
Garrulus glandarius brandtii Eversmann, 1842	Сойка	LC					*
Pica pica sericea Gould, 1845	Сорока	LC	*				
Corvus dauuricus Pallas, 1776	Даурская галка	LC				*	
Corvus frugilegus pastinator Gould, 1845	Грач	LC				*	
Corvus corax kamtschaticus Dybowski, 1883	Ворон	LC					*
Corvus corone orientalis Eversmann, 1841	Чёрная ворона	LC	*				
Corvus macrorhynchos mandshuricus Buturlin, 1913	Большеклювая ворона	LC	*				
Prunella montanella montanella (Pallas, 1776)	Сибирская завирушка	LC					*
Passer montanus dybowskii Domaniewski, 1915	Полевой воробей	LC	*				

Dendronanthus indicus (J.F. Gmelin, 1789)	Древесная трясогузка	LC				*	
Anthus gustavi gustavi Swinhoe, 1863	Сибирский конек	VU				*	
Anthus (gustavi) menzbieri Shulpin, 1928	Конёк Мензбира	VU				*	
Anthus hodgsoni yunnanensis Uchida & Kuroda, 1916	Пятнистый конек	LC				*	
Anthus cervinus (Pallas, 1811)	Краснозобый конек	LC				*	
Anthus (rubescens) japonicus (Temminck & Schlegel, 1847)	Гольцовый конек	LC				*	
Anthus richardi Vieillot, 1818	Степной конек	LC				*	
Motacilla cinerea cinerea Tunstall, 1771	Горная трясогузка	LC	*				
Motacilla (alba) lugens Gloger, 1829	Камчатская трясогузка	LC	*				
Motacilla (alba) leucopsis Gould, 1838	Китайская белая трясогузка	LC	*				
Budytes citreolus citreolus Pallas, 1776	Желтоголовая трясогузка	LC				*	
Budytes (tschutschensis) macronyx (Stresemann, 1920)	Китайская желтая трясогузка	LC	*				
Budytes taivanus (Swinhoe, 1863)	Зеленоголовая трясогузка	LC				*	
Budytes tschutschensis plexa (Thayer & Bangs, 1914)	Берингийская желтая трясогузка	LC				*	
Fringilla montifringilla Linnaeus, 1758	Вьюрок	LC				*	
Coccothraustes coccothraustes schulpini H. Johansen, 1944	Обыкновенный дубонос	LC				*	
Eophona migratoria migratoria E. Hartert, 1903	Малый черноголовый дубонос	LC	*				
Erythrina erythrina grebnitskii (Stejneger, 1885)	Обыкновенная чечевица	LC				*	

Carpodacus [Uragus] sibiricus ussuriensis (Buturlin, 1915)	Урагус, или долгохвостая чечевица	LC	*				
Carpodacus roseus roseus (Pallas, 1776)	Сибирская чечевица	LC				*	
Pyrrhula cineracea Cabanis, 1872	Серый снегирь	LC				*	
Pyrrhula griseiventris rosacea Seebohm, 1882	Уссурийский снегирь	LC				*	
Leucosticte arctoa brunneonucha (von Brandt, 1842)	Сибирский горный вьюрок	LC					*
Chloris sinica ussuriensis E. Hartert, 1903	Китайская зеленушка	LC	*				
Acanthis flammea flammea (Linnaeus, 1758)	Обыкновенная чечетка	LC				*	
Spinus spinus (Linnaeus, 1758)	Чиж	LC				*	
Calcarius lapponicus kamtschaticus Portenko, 1937	Подорожник	LC					*
Plectrophenax nivalis vlasowae Portenko, 1937	Пуночка	LC					*
Spina fucata fucata (Pallas, 1776)	Ошейниковая овсянка	LC	*				
Emberiza cioides weigoldi Jacobi, 1923	Красноухая овсянка	LC	*				
Emberiza leucocephalos leucocephalos S.G. Gmelin, 1771	Белошапочная овсянка	LC					*
Schoeniclus yessoensis yessoensis (Swinhoe, 1874) [Schoeniclus yessoensis continentalis (Witherby, 1913)]	Рыжешейная овсянка	NT	*				
Schoeniclus pallasi minor (von Middendorff, 1853)	Полярная овсянка	LC					*
Schoeniclus schoeniclus pyrrhulinus Swinhoe, 1876	Тростниковая овсянка	LC	*				
Cristemberiza elegans elegans (Temminck, 1836)	Желтогорлая овсянка	LC				*	

Ocyris spodocephala spodocephala (Pallas, 1776)	Седоголовая овсянка	LC	*				
Ocyris rusticus (Pallas, 1776)	Овсянка-ремез	VU				*	
Ocyris rutilus (Pallas, 1776)	Рыжая овсянка	LC				*	
Ocyris pusillus (Pallas, 1776)	Овсянка-крошка	LC				*	
Ocyris aureolus ornatus (Shulpin, 1928)	Дубровник	CR				*	
Ocyris tristrami (Swinhoe, 1870)	Таежная овсянка	LC				*	
Periparus ater amurensis Buturlin, 1907	Московка	LC				*	
Poecile palustris brevirostris Taczanowski, 1872	Черноголовая гаичка	LC	*				
Poecile montanus baicalensis Swinhoe, 1871	Пухляк	LC				*	
Parus minor wladiwostokensis O. Kleinschmidt, 1913	Восточная синица	LC	*				
Remiz consobrinus consobrinus (Swinhoe, 1870)	Восточный ремез	LC	*				
Alauda arvensis intermedia Swinhoe, 1863	Полевой жаворонок	LC	*				
Locustella fasciolata (G.R. Gray, 1861)	Таёжный сверчок	LC				*	
Locustella pryeri sinensis (Witherby, 1912)	Японский сверчок	NT	*				
Locustella certhiola certhiola (Pallas, 1811)	Певчий сверчок	LC	*				
Locustella ochotensis ochotensis (von Middendorff, 1853)	Охотский сверчок	LC				*	
Locustella lanceolata lanceolata (Temminck, 1840)	Пятнистый сверчок	LC				*	
Arundinax aëdon rufescens (Stegmann, 1929)	Толстоклювая камышевка	LC	*				

Acrocephalus bistrigiceps Swinhoe, 1860	Пестроголовая, или чернобровая камышевка	LC	*				
Acrocephalus tangorum La Touche, 1912	Маньчжурская камышевка	VU	*				
Acrocephalus orientalis (Temminck & Schlegel, 1847)	Восточная дроздовидная камышевка	LC	*				
Delichon urbicum lagopodum (Pallas, 1811)	Воронок	LC				*	
Delichon dasypus dasypus (Bonaparte, 1850)	Восточный воронок	LC				*	
Cecropis daurica japonica (Temminck & Schlegel, 1845)	Рыжепоясничная ласточка	LC		*			
Hirundo rustica gutturalis Scopoli, 1786	Деревенская ласточка	LC		*			
Riparia riparia taczanowskii Stegmann, 1925	Береговушка	LC				*	
Abrornis inornata (Blyth, 1842)	Пеночка-зарничка	LC				*	
Abrornis proregulus (Pallas, 1811)	Корольковая пеночка	LC				*	
Phylloscopus fuscatus fuscatus (Blyth, 1842)	Бурая пеночка	LC				*	
Phylloscopus schwarzi (Radde, 1863)	Толстоклювая пеночка	LC				*	
Acanthopneuste borealis borealis (Blasius, 1858)	Пеночка-таловка	LC				*	
Acanthopneuste coronatus (Temminck & Schlegel, 1847)	Светлоголовая пеночка	LC				*	
Acanthopneuste plumbeitarsus (Swinhoe, 1860)	Зелёная пеночка	LC				*	

Acanthopneuste tenellipes (Swinhoe, 1860)	Бледноногая пеночка	LC				*	
Urosphena squameiceps ussurianus (Seebohm, 1881)	Короткохвостка	LC				*	
Horornis canturians borealis (C.W. Campbell, 1892)	Короткокрылая камышевка	LC	*				
Aegithalos caudatus caudatus (Linnaeus, 1758)	Ополовник	LC				*	
Paradoxornis heudei polivanovi Stepanyan, 1974	Тростниковая сутора	NT	*				
Sinosuthora webbiana mantschurica (Taczanowski, 1885)	Бурая сутора	LC	*				
Zosterops erythropleurus Swinhoe, 1863	Буробокая белоглазка	LC				*	
Certhia familiaris daurica Domaniewski, 1922	Обыкновенная пищуха	LC				*	
Sitta europaea amurensis Swinhoe, 1871	Обыкновенный поползень	LC				*	
Agropsar sturninus (Pallas, 1776)	Малый скворец	LC	*				
Agropsar philippensis (J.R. Forster, 1781)	Краснощекий скворец	LC	*				
Spodiopsar cineraceus (Temminck, 1835)	Серый скворец	LC	*				
Muscicapa griseisticta (Swinhoe, 1861)	Пестрогрудая мухоловка	LC				*	
Muscicapa sibirica sibirica J.F. Gmelin, 1789	Сибирская мухоловка	LC				*	
Muscicapa dauurica dauurica Pallas, 1811	Ширококлювая мухоловка	LC				*	
Cyanoptila cyanomelana intermedia (Weigold, 1922)	Синяя мухоловка	LC				*	
Icotorus sibilans (Swinhoe, 1863)	Соловей-свистун	LC				*	

Larvivora cyane bochaiensis Shulpin, 1928	Синий соловей	LC				*	
Calliope calliope calliope (Pallas, 1776)	Соловей-красношейка	LC				*	
Tarsiger cyanurus (Pallas, 1773)	Синехвостка	LC				*	
Ficedula albicilla (Pallas, 1811)	Восточная малая мухоловка	LC				*	
Ficedula mugimaki (Temminck, 1836)	Таежная мухоловка	LC				*	
Ficedula zanthopygia (Hay, 1845)	Желтоспинная мухоловка	LC	*				
Phoenicurus auroreus auroreus (Pallas, 1776)	Сибирская горихвостка	LC	*				
Monticola philippensis philippensis (Statius Muller, 1776)	Синий каменный дрозд	LC	*				
Saxicola maurus stejnegeri (Parrot, 1908)	Восточный чекан	LC	*				
Turdus hortulorum P.L. Sclater, 1863	Сизый дрозд	LC	*				
Turdus pallidus J.F. Gmelin, 1789	Бледный дрозд	LC				*	
Turdus naumanni Temminck, 1820	Дрозд Науманна	LC				*	
Turdus eunomus Temminck, 1831	Бурый дрозд	LC				*	
			84	**21**	**14**	**141**	**25**

Annex IV

Important Excerpts from The Law of the Primorsky Krai on Amendments to The Law Of Primorsky Krai on Specially Protected Natural Territories of the Primorski Krai

Khasansky park is a protected area of regional importance (exact term translation is “nature park”). In accordance with recent changes to regional protected areas legislation, the following statements have been included into the law concerning protected areas of regional importance, particularly change of boundaries and abolition of protected areas of regional importance.

The changes to the law have been accepted on 24th of July, 2019.

Reasons for changes in the boundaries of specially protected natural areas of regional importance are:

- Inclusion of a part of a specially protected natural territory of regional significance in the composition of a specially protected natural territory of federal significance;
- The exclusion from the specially protected natural territory of the regional importance of a part of the territory due to the loss of special environmental, scientific, cultural, aesthetic, recreational and health-improving significance by natural complexes and objects located in this territory, for the protection of which a specially protected natural territory of regional significance was formed;
- The need to increase the area of a specially protected natural territory of regional significance.

Reasons for the abolition of a specially protected natural territory of regional significance are:

- The inclusion of a specially protected natural territory of regional significance into a specially protected natural territory of federal significance;
- Complete destruction of the protected natural complex or object as a result of natural or man-made impacts when it is impossible to restore them;
- The loss of protected natural complex or subject of special environmental, scientific, cultural, aesthetic, recreational and health-improving significance if it is impossible to restore it.
- Change of borders or the abolition of specially protected natural territories of regional significance for other reasons **is not allowed**.

If it is possible to restore a natural complex or object, as well as its special environmental, scientific, cultural, aesthetic, recreational and recreational value, the bodies and institutions authorized to manage specially protected natural territories of regional significance organize the necessary measures for the functioning and provision of a special protection regime in accordance with the objectives of creating a specially protected natural territory of regional importance.

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