ADB

Regional Flyway Initiative · Site Study

May 2026

RFI Priority Site · Mongol Daguur IBA including Ulz River and Khukh Lake (include SPA)

Prepared by Ding Li Yong & Mike Crosby, with additional input from Batmunkh Davaasuren, Munkhjargal Myagmar, Nyambayar Batbayar, James Hogg, Kelvin Peh, Evelyn Pina-Covarrubias and Stefano Barchiesi

BirdLife International, University of Southampton, University of Singapore

Asian Development Bank

General Site Information

Country	Mongolia			
RFI Site Name	Mongol Daguur IBA including Ulz River and Khukh Lake (include SPA)			ID046
City/ Municipality, Province, Region	Dashbalbar, Chuluunkhoroot, Kherlen, and Gurvanzagal soum, Dornod Aimag			
Geographical coordinates	49.72 º N, 115.25 º E		Area	5,560 km²
Key species	White-naped and Hooded Crane, Common Pochard, Swan Goose, Pallas's Cat, Mongolian Gazelle			
Key habitats (biomes)	Arid steppe, rolling steppes, marshy wetlands, reedbeds, a large and wide marshland with sedges and reedbeds, and small ponds and pools			
Key ecosystem services	Provisioning (fresh water) and regulating services (climate and hydrological)			
Key drivers of change	Unsustainable grazing, and dry season fires.			
Conservation status (mark all that applies)	■	Protected Area	■	Flyway Network Site
	■	Ramsar Site		Others _____
IBA/ KBA name (and number) and other designations	Mongol Daguur, Khukh. Also designated as a UNESCO World Heritage property under transboundary 'Landscapes of Dauria'			
Management Stakeholders	MECC, Dornod Aimag administration, protected area administration for Mongol Daguur SPA and Biosphere Reserve, UNESCO			
With management plan?				
Project concept themes	Rangeland management, fire management, local livelihoods and wildlife management			
Length of project	5 years			
Sector/s	Agriculture and livestock management, tourism			
No. of potential beneficiaries				
Indigenous Peoples		No	■	Yes, Buryat and Daur communities (in Ereentsav, Choibalsan)
Anticipated Implementation Risks	Reduced incomes for herding households, wildlife disturbance by tourism infrastructure establishment			
Estimated Project Budget (US$)	12,450,000			
Potential Source/s of Financing	■	Loan (to be identified)		Private Sector
	■	Grant (to be identified)		Public-Private Partnership

Table of Contents

Abbreviations

ADB	Asian Development Bank
AWC	Asian Waterbird Census
CSR	Conservation Status Review
DMC	Developing Member Country
EAAFP	East Asian-Australasian Flyway Partnership
IBA	Important Bird and Biodiversity Area
IUCN	International Union for the Conservation of Nature
KBA	Key Biodiversity Area
MECC	Ministry of Environment and Climate Change
MAS	Mongolian Academy of Sciences
MCST	Ministry of Culture, Sports, Tourism, and Youth
MOFALI	Ministry of Food, Agriculture, and Light Industry
NGO	Non-governmental Organisation
NP	National Park
NR	Nature Reserve
NUM	National University of Mongolia
RFI	Regional Flyway Initiative
SPA	Strictly Protected Area
TESSA	Toolkit for Ecosystem Services Assessment
USD	United States Dollars
UNESCO	United Nations Educational, Scientific and Cultural Organization
WCS	Wildlife Conservation Society
WSCC	Wildlife Science and Conservation Center Mongolia

Executive Summary

The steppes and lakes of eastern Mongolia form a part of the transboundary Daurian ecoregion that spans Mongolia, Russia and China, and lies at the northern and central edge of the East Asian-Australasian Flyway and supporting important staging and stopover habitat for internationally important concentrations of migrating waterbirds. Much of eastern Mongolia falls within the upper catchment of the Amur River Basin and is drained by tributaries of the Amur. Mongol Daguur Strictly Protected Area is located in the Daurian forest-steppe ecoregion and spans an area exceeding 200,000 ha of taiga-steppe, steppe lakes, grasslands, and wetlands (meadows, bogs) in the upper reaches of the Ulz rivers and spans the soums of Dashbalbar, Chuluunkhoroo, Kherlen and Gurvanzagal. The Mongol Daguur is part of a vast transboundary landscape spanning Mongolia, Russia and China, recognised for its biodiversity significance, supporting key populations of 12 species, including four which are threatened, White-naped Crane *Antigone vipio* (VU), Hooded Crane *Grus monacha* (VU), Common Pochard (VU) and Swan Goose *Anser cygnoides* (VU).

Mongol Daguur Strictly Protected Area (SPA), which overlaps with two IBAs (Mongol Daguur, Khukh), was established in 1992. And has since been designated as an East Asian Crane Network Site, and as a Ramsar site in 1997, and as an EAAFP Flyway Network Site in 2016. Mongol Daguur falls under the jurisdiction of the Dornod Protected Area Administration and overlaps with four soums. In 2007, Mongol Daguur SPA became designated as a Biosphere Reserve, and subsequently, a UNESCO World Heritage Site as part of the wider 'Landscapes of Dauria', together with Russia.

Much of Mongol Daguur and Khukh Lake is sparsely populated, and the main form of land use is grazing, which has caused limited degradation. Mongol Daguur and Khukh Lake are in a tourism development area and have good potential to expand community-based tourism, which has now been strengthened by UNESCO recognition. Proposed interventions that can help strengthen the management of this extensive transboundary steppe landscape involves, (1) the expansion of a site management and zoning plan, which stronger regulation to manage grazing activities and dry season fires, (2) improved biodiversity and threat monitoring, and (3) grassland restoration, complementing by the strengthening existing mechanisms for transboundary cooperation with protected areas in neighbouring Russia and China. Other relevant interventions include the limited expansion of tourism infrastructure (in accordance with established zoning and management plans) to improve access to nature-based tourism, alongside the development of livelihood opportunities for local community groups, several which are already well established in the Mongol Daguur landscape from earlier projects.

1. Background of the Regional Flyway Initiative

In July 2021, the Asian Development Bank made a commitment to develop a long-term Regional Flyway Initiative (RFI) in the East-Asian Australasian Flyway (EAAF) (Sovereign Project 55056-001) to protect and restore priority wetland ecosystems and the associated ecosystem services they provide in the EAAF, the most threatened migratory bird flyway globally. The Initiative is slated for implementation in nine ADB developing member countries (DMCs) in East, South and Southeast Asia: Mongolia, People's Republic of China (PRC), Bangladesh, Viet Nam, Cambodia, Philippines, Thailand, Malaysia and Indonesia. In 2023, the geographic scope of the RFI was further extended to two DMCs in Southeast Asia and the Pacific respectively, Lao PDR and Papua New Guinea.

The primary aim of the RFI is to enhance and expand the existing efforts in conserving and managing wetlands of the highest priority for migratory birds within the EAAF through innovative loan and grant financing, and at scale. Consultations and analyses over the development period help identify key interventions to strengthen the management of wetlands, enabling the implementation of nature-based solutions while strengthening biodiversity protection. Over time, the RFI seeks to leverage collaborative opportunities by developing partnerships among important stakeholders including national governments, civil society organizations, communities, regional organizations like the East Asian-Australasian Flyway Partnership (EAAFP), development agencies, the private sector, and other relevant entities.

Through the RFI Technical Assistance (TA) implemented over the RFI's development phase from 2021 to 2024, BirdLife International takes the lead in providing and coordinating technical support for development of the RFI. This is carried out in collaboration with the EAAFP and a consortiumof international non-governmental organizations including Wetlands International and the Paulson Institute, as well as two universities, namely the University of Southampton, UK and the National University of Singapore. Over the development phase, the TA team undertook a site selection analysis to identify priority wetland sites in all 10 countries based on recent bird data benchmarked against internationally accepted criteria under the Convention on Wetlands of International Importance (or Ramsar Convention), EAAFP Flyway Network Sites and Important Bird and Biodiversity Areas (IBAs). The team further developed ecosystem services profiles for prioritised wetlands using a multi-pronged approach used the TESSA ecosystem services assessment tool, and data-driven modelling of water-based ecosystem services and stored carbon.

In Mongolia, a total of 48 wetland sites were initially assessed through published data in the Mongolia IBA Inventory (see Batbayar & Tseevenmyadag 2005), a review of the peer-reviewed literature, and consultations with technical experts. Of these, a total of (12) wetlands were ranked, defined and identified to be RFI priority sites on the basis that they support more than 1% the flyway population of at least one EAAF migratory waterbird species. Four (4) of the RFI wetland sites identified lie with the Amur-Heilongjiang Basin in eastern Mongolia, most notably a cluster of sites around Dornod and Sukhbaatar provinces, including Mongol Daguur SPA, Khurkh-Khuiten, Buir and Tashgain Tavan lakes. Two of the RFI sites, including Terkhiin Tsagaan and Ogii Lakes lie within the catchment of the Yenisey River, with outflows into the Selenge River. The remaining wetlands identified are endorheic lakes in the Altai or Gobi region. At least 48 EAAF species exceeded the 1% threshold at the site level in Mongolia, including nearly the entire breeding and staging population of the Swan Goose (Batbayar et al. 2013; Damba et al. 2021).

2. Site profile of Mongol Daguur IBA including Ulz River and Khukh Lake

Location: Mongol Daguur Important Bird and Biodiversity Area (IBA) are located in eastern Mongolia, in Dornod *aimag* close to the international border between Mongolia and Russia. It includes Mongol Daguur, a flat plain with rolling hills in the Ulz River basin, and Khukh Lake, which lies in the southwest of Ereentsav *soum*. This site is located 969 km east of Ulaanbaatar, 200 km north of Choibalsan City, 2 km west of Ereenzav settlement and 10 km east of Dashbalbar settlement.

Area: 5,560 km²

Altitude: 566-821 m asl.

Geographical coordinates: 49.72 º N, 115.25 º E

Description of site: This landscape comprises an area of arid steppe with extensive, biologically important wetlands; the larger northern part is composed of rolling steppes and wetlands on the south shore of Tari Lake, while the southern part encompasses a strip of the Ulz River and its marshy wetlands. Several small lakes dot this landscape, the largest being Khaitsiin Tsagaan (7.6 km²), Mongol Tsagaan (7.2 km²), Galuut (6.5 km²), Doroo (6.5 km²), Tari and Khukh lakes, which are fed either by rainwater, in which case their size and water levels vary depending upon rainfall, or by rivers and streams. Khukh Lake is fed by the Teel River and has no outflow, and Tari Lake is fed by the Ulz River. The aquatic plant communities include forb grass (*Agropyron*, *Hordeum*, *Poa*) meadows, halophytic sedges (*Puccinella*, *Hordeum* spp.), and grass meadows, sedge beds and reed beds (*Eleocharis*, *Phragmites*) on swampy meadow soils. There are marshes and reedbeds where the Teel River enters Khukh Lake. The Ulz River valley consists of a large and wide marshland with sedges and reedbeds, and small ponds and pools, which are important habitats for nesting and migrating waterbirds.

Site administration, management and land tenure: The 103,000 ha Mongol Daguur Strictly Protected Area and its Buffer Zone were established in 1992. The Strictly Protected Area constitutes a part of the trilateral Daurian International Protected Area, established in 1994, which also includes Daursky Nature Reserve (Russia) and Dalai Lake Nature Reserve (China). The Strictly Protected Area has been designated as an East Asian Crane Network Site. Mongol Daguur was designated as a Ramsar site in 1997, as two separate IBAs (Mongol Daguur and Khukh Lake IBAs) in 2009 and as an EAAFP Flyway Network Site in 2016. Mongol Daguur is state owned, and under the jurisdiction of Dornod Protected Area Administration, Chuluun Khoroot soum and Dashbalbar soum in Dornod aimag, and the Ministry of Environment and Climate Change. The management authorities are the soum administration of Choibalsan, and Dornod Mongol Protected Area Administration of the MECC, in collaboration with the Dornod Mongol Protected Area Administration.

In 2007, Mongol Daguur Strictly Protected Area became designated as a Biosphere Reserve under the Man and the Biosphere (MAB) Programme in 2007. In 2017, it became recognised as a constituent property part of the UNESCO World Heritage site 'Landscapes of Dauria', together with Russia, and together covering a total of 859,102 ha.

Social and economic values: The density of human settlement is low at Mongol Daguur and Khukh Lake, but it is higher near to the lakes and in the river valleys. The main form of land use there is animal husbandry and hay collection, and the impact of livestock grazing and disturbance is increasing at important waterbird nesting areas because of a lack of management. A small area of land is cultivated, with a more extensive area of cultivation now abandoned. Since the 1990s, commercial fishing has become widespread, with the bulk of the catch being exported to China, but uncontrolled and illegal fishing poses a serious threat to the fish diversity in Khukh Lake. Mongol Daguur and Khukh Lake are in a tourism development area and have potential to develop community-based birding tourism at the wetlands. The greatest threat to biodiversity is steppe fires, which mainly originate from Russia, with fires occurring every year and covering very large areas and causing damage to vegetation around the lakes. Other conservation issues are mineral exploration, targeting gold, illegal hunting of animals, especially Mongolian Gazelle *Procapra gutturosa*, and reduced water levels in some of the rivers and lakes, presumably because of a warming climate.

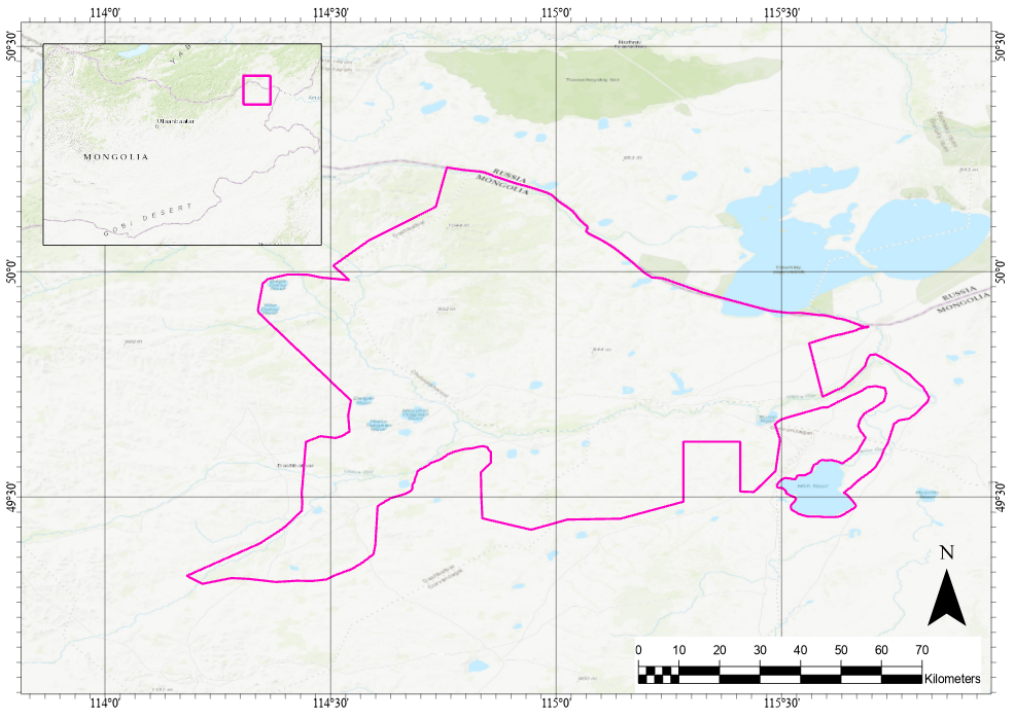

Figure 1. Map of Mongol Daguur Strictly Protected Area (SPA), showing its location on the international border with the Russian Federation (Map: Evelyn Pina Covarrubias).

3. Biodiversity value of Mongol Daguur IBA including Ulz River and Khukh Lake

3.1. Key habitats

This landscape comprises an arid steppe with extensive, biologically important wetlands; the larger northern part consists of rolling steppes and wetlands on the south shore of Tari Lake, while the southern part encompasses a stretch of the Ulz River and its marshy wetlands. There are marshes and reedbeds where the Teel River enters Khukh Lake. The Ulz River valley consists of a large and wide marshland with sedges and reedbeds, and small ponds and pools, which are important habitats for nesting and migrating waterbirds.

3.2. Importance of Mongol Daguur IBA including Ulz River and Khukh Lake for migratory waterbird species

Mongol Daguur (including Ulz River and Khukh Lake) was selected as a candidate RFI site because the available evidence shows that it supports internationally important populations of the migratory waterbirds listed in the species table below, defined as those species which have exceeded the 1% population estimates from the Conservation Status Review (CSR1) (Mundkur and Langendoen 2022). The data used was this assessment was compiled from Batbayar and Tseveenmyadag (2009), together with the available count data from the peer-reviewed literature (e.g. Davaasuren 2018; Galtbalt et al. 2022). A review of the candidate RFI sites was conducted by panels of national and international (EAAFP, Wetlands International and BirdLife) ornithological experts.

Table 1. List of migratory species (based on the EAAFP list of species) with globally significant congregations in Mongol Daguur IBA. See also Batbayar & Tseveenmyadag (2009), and Mundkur & Langendoen (2022) for EAAF species threshold.

Species name	IUCN	CSR1 score
Swan Goose *Anser cygnoides*	EN	>1%
Ruddy Shelduck *Tadorna ferruginea*	LC	>1%
Hooded Crane *Grus monacha*	VU	>10%
Common Pochard *Aythya ferina*	VU	>1%
Whooper Swan *Cygnus cygnus*	LC	>1%
Common Shelduck *Tadorna tadorna*	LC	>1%
Pacific Golden Plover *Pluvialis fulva*	LC	>1%
Spotted Redshank *Tringa erythropus*	LC	>1%
Pied Avocet *Recurvirostra avosetta*	LC	>1%
Great Crested Grebe *Podiceps cristatus*	LC	>1%

Species name	IUCN	CSR1 score
Great Cormorant *Phalacrocorax carbo*	LC	>1%
Bean Goose *Anser fabalis*	LC	>1%
Common Crane *Grus grus*	LC	>1%
White-naped Crane *Grus vipio*	VU	>1%
Demoiselle Crane *Anthropoides virgo*	LC	>1%

Mongol Daguur supports populations of the globally threatened and near threatened Swan Goose *Anser cygnoid* (EN), Common Pochard *Aythya ferina* (VU), Siberian Crane *Leucogeranus leucogeranus* (CR), White-naped Crane *Grus vipio* (VU), Hooded Crane *G. monacha* (VU), Red-crowned Crane *G. japonensis* (VU), Northern Lapwing *Vanellus vanellus* (NT), Asian Dowitcher *Limnodromus semipalmatus* (NT), Relict Gull *Larus relictus* (VU) and the Marsh Grassbird *Locustella pryeri* (NT), here at the western edge of its distribution. The wetlands there are notable for holding a significant proportion of the global breeding populations of White-naped Crane and Swan Goose, and this is the only site in Mongolia where six species of crane can be observed together at same time, including the Critically Endangered Siberian Crane which is a regular passage migrant and summer visitor to this site.

3.3. Other notable biodiversity

In addition to the waterbirds, Mongol Daguur supports populations of the globally threatened Steppe Eagle *Aquila nipalensis* (EN), Saker Falcon *Falco cherrug* (EN), Great Bustard *Otis tarda* (VU) and Mongolian Marmot *Marmota sibirica* (EN), and in winter large herds of Mongolian Gazelle *Procapra gutturosa* can be seen in the area surrounding the lake.

4. Ecosystem services

4.1. Ecosystem services provided by Mongol Daguur IBA including Ulz River and Khukh Lake

The Mongol Daguur IBA (including Ulz River ad Khukh Lake) landscape encompasses diverse wetland habitats and provides a variety of ecosystem services (Figure 2), including provisioning and regulating services that are vital to communities within the site (Table 2). The results from the RFI workshop[1] highlight the top ecosystem services provided by the site, emphasising their essential and non-substitutable nature (Table 2). These provisioning service (fresh water) and regulating services (local

[1] Asian Development Bank. (2024, November 28-29). *Mongolia: Wetland Ecosystem Services Workshop* [Workshop]. Mongolia https://events.development.asia/learning-events/mongolia-wetland-ecosystem-services-workshop

climate regulation, global climate regulation, water-flow regulation, and fire regulation) are considered essential or non-substitutable, benefitting the communities within, adjacent to and distant to the site.

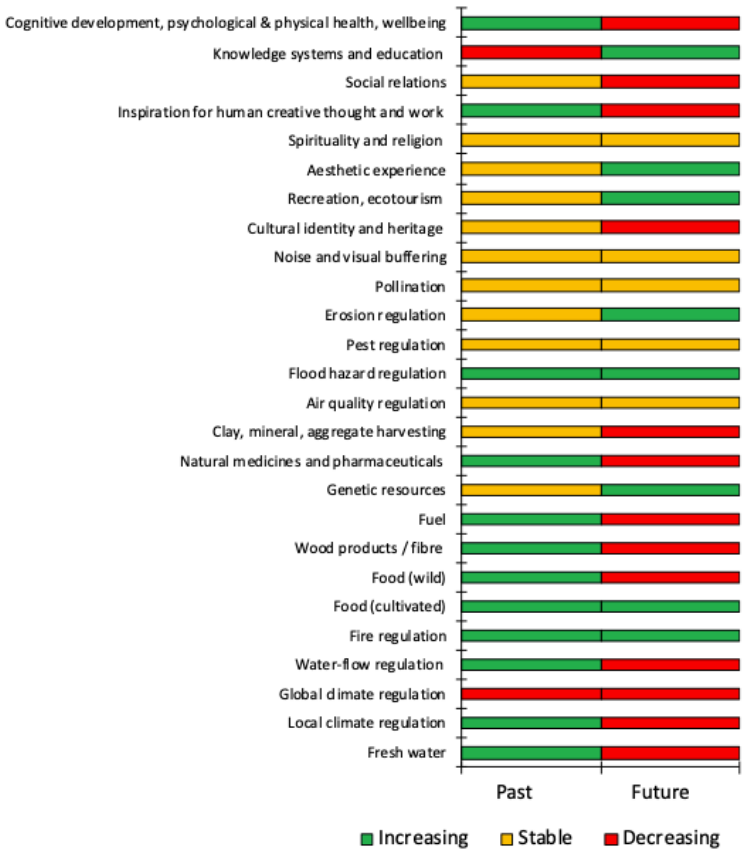

Figure 2. List of ecosystem services provided by Mongol Daguur IBA including Ulz River and Khukh Lake, as identified through stakeholder consultation at the Regional Flyway Initiative workshop.

Table 2. List of top ecosystem services provided by Mongol Daguur IBA including Ulz River and Khukh Lake.

Ecosystem services	Essential or non-substitutable	Benefits to communities			Change	
		Within the site	Adjacent to the site	Distant to the site	Past	Future
Provisioning services						
Fresh water	Yes	✓	✓	✓	Increase	Decrease
Regulating services						
Local climate regulation	Yes	✓	✓	✓	Increase	Decrease
Global climate regulation	Yes	✓	✓	✓	Decrease	Decrease
Water-flow regulation	Yes	✓	✓	✓	Increase	Decrease
Fire regulation	Yes	✓	✓	✓	Increase	Increase

4.2. Global climate regulating services

Meadow steppes (based on existing data from similar landscapes in NE Asia) are estimated to support an average aboveground biomass of 2,194 tonnes per hectare, ranging from 1,153 to 2,631 tonnes per hectare. Applying the benefit transfer method with a conversion factor of 0.5, it is estimated that the meadow steppe in the Mongol Daguur SPA and Biosphere Reserve stores an average of 1,100 tonnes of carbon per hectare. With a total grassland area of 402,000 ha in the reserve, the total carbon storage amounts to 442,200,000 tonnes.

4.3. Flood mitigation services

The flood mitigation services provided by Buir Lake were assessed using biophysical values only (see Table A1 and Annex 1 for details). When compared to the average of the six RFI inland sites in Mongolia for which hydrological data were available (Table A2 in Annex 1), Mongol Daguur shows some partly mixed results in terms of benefits and beneficiaries:

1. for the average green storage capacity per sq. km of wetland, Mongol Daguur is just below average (150 vs. 160 Giga Litres of water per km^2);
2. for the average population uniquely benefitting from influential green storage upstream per sq. km of wetland, Mongol Daguur is above average (1.25 vs. 1.09 people/km^2); but
3. for the average built-up area uniquely benefitting from influential green storage upstream per sq. km of wetland, Mongol Daguur is again well below average (0.019 vs. 0.217 ha/km^2).

5. Drivers of change and their potential impacts on Mongol Daguur IBA including Ulz River and Khukh Lake

5.1. Current drivers of change and their level of impact

Stakeholders from the RFI workshop[2] identified 48 drivers of change impacting Mongol Daguur IBA (including Ulz River and Khukh Lake), and their corresponding levels of impact on the wetland site (Table 3). High-impact drivers include desertification; drought conditions; droughts; habitat shifting and alteration; isolation from other natural habitats; livestock farming and grazing; storm and flooding; temperature extremes; and other 'edge effects' that degrade the wetland site values.

A medium impact is associated with dams, hydrological modification and water management/use; destruction of cultural heritage sites; erosion and siltation/deposition; garbage and solid waste; habitat

[2] Asian Development Bank. (2024, November 28-29). *Mongolia: Wetland Ecosystem Services Workshop* [Workshop]. Mongolia https://events.development.asia/learning-events/mongolia-wetland-ecosystem-services-workshop

clearing; hunting, killing and collecting of terrestrial animals; industrial, mining and military effluents; loss of cultural links, traditional knowledge and/or management practices; loss of keystone species; mining and quarrying; pathogens; research, education and other work-related activities; roads and railroads; shipping lanes and canals; and utility and service lines.

Table 3. Drivers of change and their potential impact on the integrity of Mongol Daguur IBA including Ulz River and Khukh Lake based on consultations with stakeholders.

Driver of change	Impact
Desertification	High
Drought conditions	
Droughts	
Habitat shifting and alteration	
Isolation from other natural habitats	
Livestock farming and grazing	
Other 'edge effects' that degrade the wetland site values	
Storm and flooding	
Temperature extremes	
Dams, hydrological modification and water management/use	Medium
Destruction of cultural heritage buildings, gardens, sites, etc.	
Erosion and siltation/deposition	
Garbage and solid waste	
Habitat clearing	
Hunting, killing and collecting of terrestrial animals	
Industrial, mining and military effluents	
Loss of cultural links, traditional knowledge and/or management practices	
Loss of keystone species	
Mining and quarrying	
Pathogens	
Research, education and other work-related activities	
Roads and railroads	
Shipping lanes and canals	
Utility and service lines	
Activities of site managers	Low
Agricultural and forestry effluents	
Air-borne pollutants	
Annual and perennial non-timber crop production	
Collecting terrestrial plants or plant products (non-timber)	
Dams within or upstream of the wetland site, which alter the hydrological regime	
Excess ponding of water onsite	
Fire and fire suppression	
Fishing, killing and harvesting of aquatic resources	
Flight paths	
Household sewage and urban wastewater from outside the wetland site	
Housing and settlement	
Increased fragmentation within the wetland site	
Invasive animal species	
Invasive plant species	
Logging and timber harvesting	
Loss of hydrological connectivity	
Natural deterioration of important cultural wetland site values	
Oil and gas drilling; extraction of sand	
Ports with large scale loading and unloading of goods	
Recreational activities and tourism	
Restoration for conservation	
Tourism and recreation infrastructure	
Water extraction/diversion within the wetland site or catchment	

5.2. Potential alternative state of Mongol Daguur IBA including Ulz River and Khukh Lake (include SPA) under current drivers of change

Stakeholders at the RFI workshop[3] defined the most plausible future alternative state (scenario) for the site up to 2035 and converted this scenario into a net change in the cover of different wetland habitats within this site (current habitat cover vs. future alternative cover; see Figure 3). This future scenario assumes that the current drivers of change affecting the site and the existing management practices will remain unchanged.

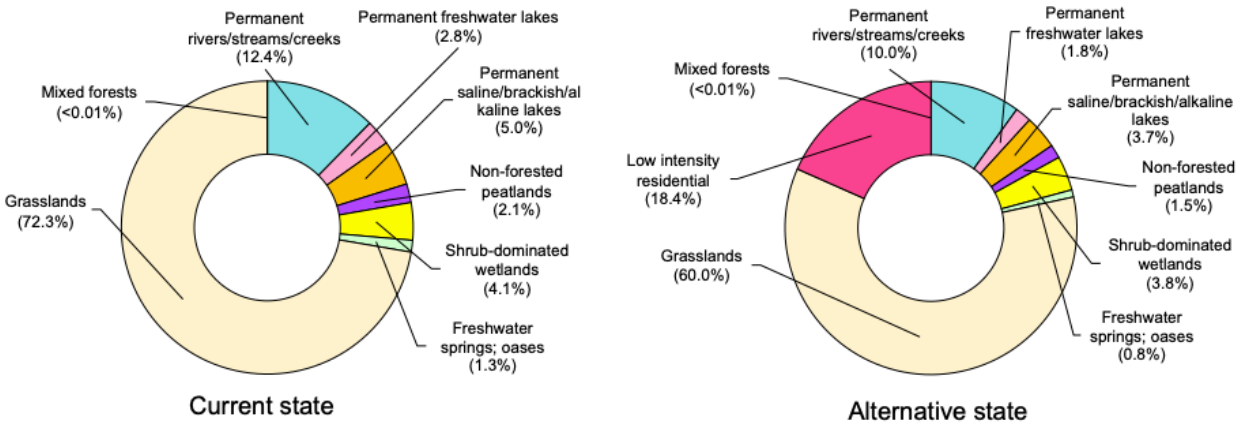

Figure 3. The proportional change in the extent of different habitat types between the current and alternative states of Mongol Daguur IBA including Ulz River and Khukh Lake.

5.3. Expected changes in the ecosystem services of Mongol Daguur IBA including Ulz River and Khukh Lake

Stakeholders at the RFI workshop[4] assessed future trends in the ecosystem services provided by Mongol Daguur IBA (including Ulz River ad Khukh Lake). Based on their local knowledge, they documented whether these services are expected to increase, decrease, or remain unchanged by 2035, assuming the current drivers of change affecting the site and the current interventions remain unchanged. Figure 2 and Table 2 show that the provisioning of fresh water and regulating services such as local climate regulation, global climate regulation, and water-flow regulation have increased in the past but are expected to decrease in the future. Only fire regulation service has increased in the past and is expected to continue increasing in the future.

[3] Asian Development Bank. (2024, November 28-29). *Mongolia: Wetland Ecosystem Services Workshop* [Workshop]. Mongolia https://events.development.asia/learning-events/mongolia-wetland-ecosystem-services-workshop

[4] Asian Development Bank. (2024, November 28-29). *Mongolia: Wetland Ecosystem Services Workshop* [Workshop]. Mongolia https://events.development.asia/learning-events/mongolia-wetland-ecosystem-services-workshop

A loss of 76,300 hectares of green water habitats including grasslands, non-forested peatlands, shrub-dominated wetlands, and freshwater springs as presented in Table A5, however equivalent to a little over 13.7% of the total land use for the site, is expected to result in roughly 17.2% or 25.8 Giga Litre reduction in green storage capacity per km² of wetland. This may amount to nearly 0.22 people and 0.003 hectares of built-up areas losing flood mitigation benefits per km² of wetland.

6. Capacity gaps and needs for the management of Mongol Daguur IBA including Ulz River and Khukh Lake

Nine stakeholder groups were identified as important to the management of Mongol Daguur Strictly Protected Area and Biosphere Reserve. Of immediate importance are stakeholders in the tourism industry, and local herders which graze the landscapes in, and around (in the buffer zone) around the site.

Table 4. Stakeholder capacity needs in Mongol Daguur Strictly Protected Area.

Stakeholder group	Current role in wetland management (Positive or Negative)	Possible future role in wetland management	Current capacity for sustainable wetland management	Capacity development needed to improve wetland management	Form of capacity development (e.g. training, organisational strengthening etc)
MECC	Policy support (+)	Policy monitoring	Medium (need more develop)	Management planning and monitoring support through policy	Training and legal and policy frameworks
Protected Area Administration	Implementation of wetland management actions (+)	Monitoring implementation of management actions	Medium (need more develop)	Networking, skills and capacity building	Training to develop stronger vision for long-term management
River Basin Authority	Policy making, implementation of wetland management actions (+)	Monitoring management and clearer role in conservation	Medium (need more develop)	Capacity building, implementation monitoring	Capacity building on policymaking and wetland management
4. Local government unit	Policy making, implementation of wetland	Implement, monitor	Medium (need more develop)	Policy coordination improvement	Training to access sustainable

Stakeholder group	Current role in wetland management (Positive or Negative)	Possible future role in wetland management	Current capacity for sustainable wetland management	Capacity development needed to improve wetland management	Form of capacity development (e.g. training, organisational strengthening etc)
	management actions (+)				financing for site management
Local governor/soum and aimag	Policy making, implementation of wetland management actions (+)	Support site management activities	Medium (need more effort)	Improving inclusiveness	Participation, training
Non-government organisations	Support, implementation of wetland management activities and actions	Implement and support site management activities	Medium	-	Participation, training
Businesses (including tourism operators)	Joint, involve or support site management activities	Sustainable use and restore	Low need more efforts	Cooperation ability	Participation, training
Local community/user groups	Involvement, implementation of site management actions and use of natural resources (+)	Sustainable use and conserve	Low (need more efforts and development)	Responsibility, implementing in their areas	Training, meeting, household livelihood promotion
International organisations	Support+	support	medium	Incisiveness, local community livelihoods	Inclusiveness, implementation monitoring and creating criteria/indicator

7. Opportunities for RFI interventions

7.1. Recommended Interventions

As one of the largest, protected steppe landscapes in eastern Mongolia, and now a part of a vast transboundary (protected area) and UNESCO World Heritage Site, there is a need to strengthen site protection and management, in accordance with UNESCO expectations for World Heritage Sites, whilst promoting local livelihood for the hundreds of grazing households that live and around the site, which may be through tourism development and/or improved management of grazing pastures (alongside grassland restoration work). They can complement targeted activities to address dry season fires, which may become more common at the site over time as a result of climate change.

Table 5. List of proposed interventions for Mongol Daguur Strictly Protected Area and possible project indicators.

Intervention	Outcome	Indicators	Cost (USD)	Timeframe	Potential Stakeholders
Component 1. Strengthening site management and protection of Mongol Daguur Biosphere Reserve and its surrounding wetland-steppe landscape					
Undertake a scoping study of existing interventions in Mongol Daguur SPA and surrounding grasslands, peatland and taiga landscapes, including targeted assessment on long-term threats (from climate change, overgrazing, tourism expansion and fisheries).	Assessment and scoping guidance to provide basis for proposed RFI interventions. Threats faced by the lake ecosystem better understood, and potential interventions identified.	Assessment report with key threats identified and recommendations for improved management published and disseminated to key stakeholders. Number of stakeholder meetings conducted in the scoping study. Number of stakeholder groups engaged in the scoping study, ensuring a participatory assessment of existing interventions and threats.	100,000	2 years	MECC Dashbalbar Chuluunkhoroot Kherlen and Gurvanzagal soum Dornod aimag government Protected Area Administration WSCC Mongolia ADB

Strengthen site management of Mongol Daguur SPA including the updating of a comprehensive management plan, in line with UNESCO World Heritage standards	Mongol Daguur SPA is better managed through the development of the site management and zonation plans, installation of boundary markers for zones, and implementation of measures to address and mitigate fire risk during the dry season.	Site management plan over medium-term for Mongol Daguur developed, in consultation with all key stakeholders, including communities (soum governments) inside the site through participatory mapping. Number of stakeholder consultation meetings organised with local government and herding households (up to 500) to strengthen engagement local stakeholders for participatory mapping for zonation, understand local livelihood needs. Management plan for Mongol Daguur SPA expanded through participatory processes involving and represented households within site. Establishment and installation of boundary markers of protected area.	100,000	3 years	Dashbalbar Chuluunkhoroot and Gurvanzagal soum Dornod aimag government MECC Protected Area Administration UNESCO

Improve the safety of electrical infrastructure (e.g. powerlines) for wildlife	Wildlife protection improved through mapping of highly sensitive electric infrastructure, and planned infrastructure in buffer zone of Mongol Daguur, and retrofitting and installation of electric infrastructure that is friendly for large birds (e.g. raptors)	Highly sensitive electric infrastructure and planned infrastructure in buffer zone of Mongol Daguur mapped. Up to 500 km of electrical powerlines retrofitted to increase safety to wildlife. Up to 100 km of new powerlines (averted) or installed with wildlife-friendly fittings.	500,000	3 years	MECC Dashbalbar Chuluunkhoroot and Gurvanzagal soum Dornod aimag government Protected Area Administration Conservation organisations and consultancies

Component 2. Expand grassland and forest steppe restoration in the landscapes surrounding (and within) Mongol Daguur SPA					
Undertake an assessment of grazing pressure and land degradation in Mongol Daguur SPA, and the landscapes in the buffer zones	Mongol Daguur SPA and the landscapes in the buffer zones are better managed through roadmap and action plan development for roadmap and action plan for grassland restoration activities guided by remote sensing and participatory mapping of overgrazed areas.	Grassland / vegetation degradation map of Mongol Daguur SPA produced. Roadmap and action plan for grassland restoration activities and grazing management drafted, guided by remote sensing, participatory mapping of overgrazed areas, and grassland/ vegetation degradation maps of Mongol Daguur SPA Number of stakeholder groups engaged, targeting the local government and herding households (about 200 households) Number of meetings and workshops organized to strengthen engagement local stakeholders for participatory mapping for zonation, understand local livelihood needs, and engage national stakeholders.	100,000	2 years	Dornod aimag government Dashbalbar Chuluunkhoroot Kherlen and Gurvanzagal soum Protected Area Administration Conservation organisations

Restore the degraded and overgrazed areas of grassland and forest steppe in Mongol Daguur SPA and Biosphere Reserve and buffer zone	Degraded areas of steppe grassland damaged resulting from overgrazing restored. Degraded areas of steppe-taiga damaged resulting from overgrazing restored.	Nurseries for steppe and woodland restoration established. At least two pilot plots for steppe restoration established. At least 1,000 ha of grassland restored over a five-year period against existing baselines.	200,000	5 years	

Component 3. Wildlife research and monitoring expanded in Mongol Daguur SPA and Biosphere Reserve					
Strengthen wildlife protection and enforcement at Mongol Daguur SPA and Biosphere Reserve	Improved wildlife protection and enforcement through co-management framework, increased patrol and enforcement efforts for landscape, wildlife protection and encroachment activities, and increased capacity of local rangers	Co-management framework with local communities developed. Number of households (target of at least 50% households in site) engaged and actively participating in co-management activities. Training program and modules on patrol and enforcement (against poaching of large mammals and birds) and using SMART approaches developed. Number of training activities conducted Number of local rangers trained on patrolling and enforcement.	200,000	5 years	Dornod aimag government Dashbalbar Chuluunkhoroot Kherlen and Gurvanzagal soum Protected Area Administration Conservation organisations UNESCO

Strengthen biodiversity and grassland monitoring, with a focus on waterbird species, focal species such as White-naped Crane, and shorebirds	Better monitoring of biodiversity and wetland ecosystems in the landscape through a locally engaged biodiversity monitoring program and increased awareness of White-naped Crane, and migratory waterbird conservation amongst local households	Monitoring mechanism for the site established Number of monitoring activities conducted using the established biodiversity and wetland monitoring scheme. A locally led conservation group organized Number of awareness-raising activities (including workshops) on importance of nature protection, with a focus on charismatic bird species, implemented for SPA administration and local communities Number of stakeholder groups engaged in the awareness-raising activities.	100,000	5 years	

Scale-up research on biodiversity and ecology to strengthen evidence base for management plan development (see component 1, 2)	Mongol Daguur is better managed through improved understanding of migratory species movements (and movement ecology), improved understanding of carbon and nutrient cycles of peatlands and associated wetlands and strengthened local research capacity on wetlands and peatland ecology. Cross-border collaboration on research and monitoring findings with site managers and government stakeholders from Daursky State Nature Reserve (Russia) and Dalai Lake National Nature Reserve (China) strengthened. Long-term data on changes in landscape and grassland quality to guide site management.	Number of training programmes (including workshops) on grassland and wetland ecology, with a focus on charismatic bird and wildlife species (e.g. White-naped Crane, Pallas's Cat). Number of training activities implemented Number of local researchers and stakeholder groups trained Number of published research reflecting improved knowledge of landscape and regional connectivity of migratory bird populations. Number of research infrastructure maintained, including construction of specialized research facilities Cross-border framework for cooperation established and maintained, through UNESCO bodies.	200,000	5 years	Dashbalbar Chuluunkhoroot Kherlen and Gurvanzagal soum Protected Area Administration MECC Research institutions (incl. academy of sciences, universities) WSCC and international conservation organisations UNESCO Ramsar Convention

		Number of joint-training workshops on wildlife monitoring and management.			
Component 4. Upscaling tourism infrastructure and local capacity for specialized, nature-based tourism in (buffer zone) of Mongol Daguur SPA and Biosphere Reserve					
Establish infrastructure for specialized nature-based tourism including, hides and shelters and other associated visitor facilities.	Impact of habitat degradation caused by tourism activities in the landscape reduced through specialized and planned nature-based tourism, strengthened capacity, and microfinancing. Basic tourism infrastructure developed to enhance opportunities for visitors to observe waterbirds and other wildlife.	Provincial-level tourism plans and strategies updated for Dornod in coordination with MCST, MECC, aimag government and relevant tourism stakeholders. Number of training activities to strengthen local capacity for sustainable specialized tourism Number of stakeholders engaged in tourism-related activities engaged. Nature-based tourism strategy and business plans and packages on specialized wildlife/nature tourism developed Number of business plans tested with tourism operators	500,000	3 years	MCST MECC Dornod aimag government Dashbalbar Chuluunkhoroot Kherlen and Gurvanzagal soum Protected Area Administration Local community groups (including herder communities) WSCC and international conservation organisations Tourism operators in Ulaanbaatar International development agencies

		(including international bird and wildlife tour companies) Number of facilities established/ upgraded, in line with the tourism infrastructure plan and ecotourism strategy Number of stakeholder groups engaged in the upgrading of tourism infrastructure and local planning Number of people benefiting from the upgraded tourism infrastructure Microfinance schemes to provide loans to small tourism businesses to improve sustainability and reduce impact created. Number of small tourism businesses in Choibalsan benefiting from the established microfinancing scheme.			

Strengthen the capacity of local communities and businesses for nature-based tourism.	Impact of habitat degradation caused by tourism activities in the landscape reduced through increased local capacity of local communities and businesses for nature-based tourism.	Framework for benefits-sharing from nature-based tourism enhanced for households and tourism operators. Number of stakeholder groups engaged in the framework development for nature-based tourism Training program on nature-based tourism developed Number of stakeholders trained on tourist management (target of at least 100 households)	300,000	5 years	
Component 5. Strengthening sustainable, community-based management in Mongol Daguur SPA and adjacent areas (in buffer zone) to address over-grazing (see Component 2)					
Strengthen the local capacity in sustainable rangeland management, and management of livestock	Improved condition of grassland (pasture) in Khurkh Khuiten (in zoned areas) and adjacent landscapes against baselines.	Number of stakeholder consultation meetings organised, targeting at least 200 households to engage local people on rangeland management, sustainable grazing practices Training programmes focusing on community-based rangeland management, including livestock grazing regimes (e.g. rotational	500,000	5 years	MOFALI MECC Dashbalbar Chuluunkhoroot Kherlen and Gurvanzagal soum Protected Area Administration Local community groups (including herder communities)

		grazing) established. Training programme(s) on grazing management established with local governments and MOFALI. At least 200 (up to 500) households in Mongol Daguur and surrounding landscapes trained with sustainable rangeland management and herding practices. Number of trained stakeholders adopting the sustainable rangeland management and management of livestock.			International development agencies IUCN Conservation organisations Agricultural banks
Scale up of sustainable rangeland use/grazing activities. Strengthen the resilience of herding households.	Improved condition of grassland in degraded areas in the buffer zone of Mongol Daguur SPA (in zoned areas) and adjacent landscapes against baselines through microfinance mechanisms, incentives (and compliance mechanisms) for best practices in grazing and rangeland management, and	Number of stakeholder consultation meetings organised, targeting XX households. Number of exchange visits organized for herding households to other landscapes with good grazing and livestock management in place (e.g. Hustain NP).	250,000	5 years	MOFALI MECC Dashbalbar Chuluunkhoroot Kherlen and Gurvanzagal soum Protected Area Administration Conservation organisations International development agencies

	benchmarking visits.	Microfinance mechanism (for local loans and grants) created for local households and supported by lending institutions. 100 households benefiting from small grants and microloans on animal husbandry and livestock management practices. Incentives (and compliance mechanisms) for best practices in grazing and rangeland management created. Number of stakeholders trained and engaged who adopted sustainable rangeland use/ grazing activities			IUCN
Total investment for five years			12,450,000		

7.2. Potential Financing

The estimated project cost is USD 12,450,000 over a 5-year period. This project supports the development of plans for site management, zonation, and tourism, creation of a co-management framework, training programs on patrol and enforcement, biodiversity monitoring, nature-based tourism, community-based rangeland management, grazing and livestock management, and solid waste management, establishment of infrastructure for tourism, restoration of degraded grassland and forest steppe, and creation of microfinance mechanisms.

7.3. Proposed Institutional Arrangements

The proposed project is expected to be implemented over a period of up to ten (10) years, with the main project components focusing on improved site management of the Mongol Daguur Strictly Protected Area and Biosphere Reserve (and inscribed property under UNESCO Landscapes of Dauria), strengthening local capacity in grassland management practices, improving biodiversity monitoring, improving rangeland and grazing management practices (led by MECC and soum administrations), and scaling up nature-based tourism with a focus on specialised nature tourism. Conservation organisations such as the Wildlife Science and Conservation Center Mongolia, international NGOs and development agencies can be expected to play a major supporting and technical role in the project through delivering high-quality research and biodiversity monitoring, building the capacity of local communities on wildlife conservation and grazing management, and work to retrofit transmission wires to ensure safety for wildlife such as large raptors.

7.4. Project Beneficiaries

This proposed project is expected to undertake activities to promote gender inclusion and participation in livelihood activities, through capacity building activities for local households. The minority ethnic group in the Mongol Daguur SPA are the Buryat and Daur people, whose community is represented in Ereentsav and Choibalsan.

7.5. Anticipated Implementation Risks

Environment: Nature-based tourism has been identified as a key project concept theme. The proposed interventions include establishing tourism infrastructure to improve the tourism experience at Mongol Daguur IBA. Building these infrastructures, however, would generate noise that may disturb wildlife, including breeding waterbirds such as White-naped Crane, waterfowl and Pallas's Cat. Moreover, increasing tourism activities bring other human-induced impact, such as waste pollution. Planning with the stakeholders is critical before any infrastructure development and tourism management.

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Annex 1. Supplementary information on flood mitigation services

To further validate the identification of the top ecosystem services by means of stakeholder consultation, an expectedly essential or non-substitutable regulating service across all RFI sites, namely coastal protection and flood mitigation (i.e., storm and flood hazard regulation), was assessed based on a combination of globally available datasets supplemented by web-based tool Co$tingNature (Mulligan, 2022). Estimates for flood mitigation were spatially inferred in QGIS from a selection of metrics expressing different biophysical values modelled online by the Water World component of this tool. Equivalent data to assess monetary values similarly to coastal protection were not available for the RFI region.

The key metrics selected for biophysical values (Table A1) were the average green storage capacity, which is the volume of water stored by each square kilometre of wetland itself as well as its soil and vegetation, and the direct influence of this storage capacity on beneficiaries found downstream of the wetland, both as the average number of people and the average built-up area that are uniquely benefitting from the resulting flood mitigation (and not from other green storage found upstream).

Table A1. Contribution of the wetland habitats to flood mitigation in Mongol Daguur based on site-level (biophysical) values inferred from Mulligan (2022) and expressed as ranges to represent the resulting uncertainty.

Influence of the wetland on flood mitigation (metrics)	**Benefit/Beneficiaries**
Average green storage capacity per sq. km of wetland in million cubic metres (GigaLitres/km2)	149 – 151
Average population uniquely benefitting from influential green storage upstream per sq. km of wetland (n/km2)	1.21 – 1.29
Average built-up area uniquely benefitting from influential green storage upstream per sq. km of wetland (ha/km2)	0.019 – 0.020

Table A2. Biophysical benefits from and beneficiaries of RFI inland wetland sites for which hydrological data (i.e., the Amur and Yenisei River Basins) were available (expressed as ranges to represent the resulting uncertainty)

Site name	**Green storage capacity (GigaLitres/km^2)**	**Downstream population (n /km^2)**	**Downstream built-up area (ha /km^2)**
Buir Lake	119 (±5)	0.92 (±0.04)	0.185 (±0.007)
Khurkh Khuiten	179 (±4)	1.61 (±0.04)	0.260 (±0.006)
Mongol Daguur	150 (±1)	1.25 (±0.04)	0.019 (±0.001)

Ogii Lake	169 (±13)	0.70 (±0.05)	0.316 (±0.024)
Tashgain Tavan Lakes	203 (±4)	1.49 (±0.03)	0.301 (±0.006)
Terkhiin Tsagaan Lake	138 (±5)	0.54 (±0.02)	0.219 (±0.008)

Table A5. Key habitat types in Mongol Daguur IBA including Ulz River and Khukh Lake based on stakeholder-based assessment at the Regional Flyway Initiative workshop in November 2024.

Habitat type	Current state		Alternative state (2035)	
	Area (ha)	Cover (%)	Area (ha)	Cover (%)
Mixed forests	5.7	0.0	5.7	0.0
Permanent rivers/streams/creeks	68993.7	12.4	55662.7	10.0
Permanent freshwater lakes	15578.8	2.8	10019.3	1.8
Permanent saline/brackish/alkaline lakes	27827.5	5.0	20595.2	3.7
Non-forested peatlands	11499.0	2.1	8349.4	1.5
Shrub-dominated wetlands	22997.9	4.1	21151.8	3.8
Freshwater springs; oases	7235.1	1.3	4453.0	0.8
Grasslands	402495.5	72.3	333976.5	60.0
Low intensity residential	0.0	0.0	102419.5	18.4
Total	556633.2	100.0	556633.2	100.00