Ramsar Information Sheet

Published on 16 October 2020

India

Asan Conservation Reserve

Designation date	21 July 2020
Site number	2437
Coordinates	30°26'01"N 77°40'58"E
Area	444,40 ha

Color codes

Fields back-shaded in light blue relate to data and information required only for RIS updates.

Note that some fields concerning aspects of Part 3, the Ecological Character Description of the RIS (tinted in purple), are not expected to be completed as part of a standard RIS, but are included for completeness so as to provide the requested consistency between the RIS and the format of a 'full' Ecological Character Description, as adopted in Resolution X.15 (2008). If a Contracting Party does have information available that is relevant to these fields (for example from a national format Ecological Character Description) it may, if it wishes to, include information in these additional fields.

1 - Summary

Summary

The Asan Conservation Reserve (ACR), spread over an area of 444.4 ha, primarily comprises a freshwater wetland system at the confluence of Asan River and Yamuna River canal near village Dhalipur in Dehradun district, Uttarakhand. It was notified as a Conservation Reserve by the Government of Uttarakhand under Section 36 A of Wildlife (Protection) Act, 1972 through Govt. of Uttaranchal order No. 2414 (1)/X-2-2005-19 (1)/2004 Dated August 5, 2005. The reserve is known particularly for its avifaunal diversity owing to which it has been identified as an Important Bird Area (IBA). In total 330 species of birds, including globally threatened species, have been reported from the reserve. It is one of the best known sites for the congregation of ruddy shelduck. The dominant aquatic vegetation comprises of Potamogeton pectinatus, Typha elephantina and Ceratophyllum demersum. Both the Irrigation Department through Uttarakhand Jal Vidyut Nigam Limited (UJVNL) and Forest Department control large parts of the reserve. The reserve has a year round availability of freshwater owing to a constant inflow of water through the Yamuna canal and Asan River. The outflow is through the Yamuna canal, which feeds two hydroelectic generating stations downstream. The villages namely Dhalipur, Kunja and Kunja Grant, Kulhal and Dhakrani lie in the immediate vicinity of the reserve but the extent of their dependence on the reserve is minimal. However, the people of these villages have high aspirations of the reserve as a potential source of livelihoods. The southern side of the reserve is surrounded by agricultural fields. Further south, there is mixed forest typical of the Siwalik hills, consisting chiefly of Shorea robusta, Anogeissus latifolia, Lannea coromandelica, Dalbergia sissoo and Bombax ceiba. Parts of the reservoir are covered by weeds such as Eichhornia crassipes and Ipomea fistulosa (Kumar and Porwal 1998). The important management issue is water management by the UJVNL, which is totally oriented towards power generation and at times is against the requirement of birds particularly the migratory waterbirds. Certain areas of the reserve suffer from the spread of weeds threatening to influence the habitat suitability for many birds and other forms of biodiversity. Siltation in the past has resulted in the creation of a mosaic of habitats even though it has reduced the water spread area. Steps have been taken to promote the reserve as a nature (bird) tourism destination.

2 - Data & location

2.1 - Formal data

2.1.1 - Name and address of the compiler of this RIS

Responsible compiler

Institution/agency	Uttarakhand Forest Department
Postal address	Divisional Forest Officer, Chakrata Forest Division, Kalsi, Post Kalsi Gate, District Dehradun, Uttarakhand, India. PIN 248159

National Ramsar Administrative Authority

Institution/agency	Uttarakhand Forest Department
Postal address	Principal Chief Conservator of Forest, Wild Life, 85, Rajpur Road, Dehradun. Uttarakhand, India. PIN 248001

2.1.2 - Period of collection of data and information used to compile the RIS

From year	1994
To year	2019

2.1.3 - Name of the Ramsar Site

Official name (in English, French or Spanish)	Asan Conservation Reserve
Unofficial name (optional)	Asan Barrage, Rampurmandi.

2.2 - Site location

2.2.1 - Defining the Site boundaries

b) Digital map/image
<2 file(s) uploaded>

Former maps	0

Boundaries description

The boundary of the site is the same as the boundary of the Conservation Reserve.

Northern boundary: The interstate boundary between Uttarakhand and Himachal Pradesh forms the northern boundary of the conservation reserve.

Eastern boundary: The village Dhalipur forms the eastern boundary of the conservation reserve.

Southern boundary: The villages Kunj, Kuna, Aduwala and Ramgarh lie on the southern boundary of the conservation reserve.

Western boundary: The village Matak Majri and confluence area of river Yamuna and river Asan forms the western boundary of the conservation reserve.

2.2.2 - General location

a) In which large administrative region does the site lie?	Uttarakhand
b) What is the nearest town or population centre?	Herbertpur, Dehradun

2.2.3 - For wetlands on national boundaries only

a) Does the wetland extend onto the territory of one or more other countries?	Yes ○ No ◉
b) Is the site adjacent to another designated Ramsar Site on the territory of another Contracting Party?	Yes ○ No ◉

2.2.4 - Area of the Site

Official area, in hectares (ha):	444.4

Area, in hectares (ha) as calculated from GIS boundaries: 439.023

2.2.5 - Biogeography

Biogeographic regions

Regionalisation scheme(s)	Biogeographic region
Freshwater Ecoregions of the World (FEOW)	Ecoregion: Ganges Himalayan Foothills; Ecoregion ID: 710

Other biogeographic regionalisation scheme

As per the biogeographic classification by Rodgers and Panwar (1988), the area of the Conservation Reserve falls under the biogeographic zone, Gangetic plains (7) and biogeographic province, Upper Gangetic plains (7A). According to the Hussain & De Roy (1993) categorization of Indian wetlands, Asan Conservation Reserve falls in the biogeographic province 4.8.4 (Indo-Gangetic monsoon forest), type 17, a water storage reservoir.

3 - Why is the Site important?

3.1 - Ramsar Criteria and their justification

<no data available>

☑ Criterion 2 : Rare species and threatened ecological communities

☑ Criterion 3 : Biological diversity

Justification: The diverse habitat of the site helps support a variety of flora and fauna. Birds are the most conspicuous of the fauna of Asan. The site is well known in the entire northern India because of the avian diversity it supports. To date by collating all available records, nearly 330 species of birds have been observed at Asan. An area of 59.05 ha of the Conservation Reserve is covered with terrestrial vegetation. Except for a small patch of plantation mainly of Eucalyptus, the rest of the area is covered with natural forest or spontaneous growth. Abundances of the principal tree species include but are not limited to Acacia catechu, Aegle marmelos, Alangium lammarkii, Albizzia lebbeck, Bombax cieba, Callistemon viminalis, Casearia tomentosa and Cassia fistula. The aquatic vegetation of the site is mainly comprised of Typha elephantina, Potamogeton pectinatus, Ceratophyllum demersum and Eichhornia crassipes. Of these Typha elephantina dominated communities covers the largest area. The surrounding bushes, which are dominant around the reservoir, are Xanthium strumarium, Eclipta prostrata, Ipomoea fistulosa, Cyperus spp., Ocimum sanctum, Euphorbia sp., Mimosa pudica, Achyranthus aspera, Polygonum glabrum, P. lanigerum, Aeschynomene sp., Ageratum conyzoides, Phyllanthus sp., Monochoria hestata, Mosla dianthera and Lantana camara. A report of the Zoological Survey of India (ZSI) on the faunal diversity of the site (published in 2003) shows the presence of 78 species of invertebrates (odonata, coleoptera, annelida, mollusca), 40 fishes, 4 amphibians, 1 reptile and 20 mammal species in the site. Further analysis of the fish fauna of Asan with reference to recent available resources gives a total of 49 species being present in the site (species checklist annexed in 6.1.2)."

☑ Criterion 4 : Support during critical life cycle stage or in adverse conditions

☑ Criterion 6 : >1% waterbird population

☑ Criterion 8 : Fish spawning grounds, etc.

Justification: This wetland serves as feeding, migration path and spawning ground for several fish species. A total of 49 fish species have been known to inhabit the site. Fishing is prohibited in the reserve and it plays an important role in supporting and maintaining the fish diversity.

3.2 - Plant species whose presence relates to the international importance of the site

<no data available>

3.3 - Animal species whose presence relates to the international importance of the site

Phylum	Scientific name	Common name	Species qualifies under criterion				Species contributes under criterion				Pop. Size	Period of pop. Est.	% occurrence 1)	IUCN Red List	CITES Appendix I	CMS Appendix I	Other Status	Justification
			2	4	6	9	3	5	7	8								
Fish, Mollusc and Crustacea																		
CHORDATA/ ACTINOPTERYGII	*Badis badis*		☐	☐	☐	☐	☐	☐	☐	☑				LC	☐	☐		Crit 8: Feeding and spawning ground.
CHORDATA/ ACTINOPTERYGII	*Danio rerio*		☐	☐	☐	☐	☐	☐	☐	☑				LC	☐	☐		Crit 8: Feeding and spawning ground.
CHORDATA/ ACTINOPTERYGII	*Labeo dyocheilus*		☐	☐	☐	☐	☐	☐	☐	☑				LC	☐	☐		Crit 8: Feeding and spawning ground.
CHORDATA/ ACTINOPTERYGII	*Tor putitora*	Assam mahseer; Common Himalayan mahseer; Copper mahseer; Gold mahseer; Golden mahseer; Himalayan salmon; Jungha mahseer; Jungha of the Assamese; Mahseer; Mosal mahseer; Putitor mahseer; Putitora mahseer; Yellowfin mahseer	☑	☐	☐	☐	☐	☐	☐	☑				EN	☐	☐		Crit 8: Migration path and feeding ground.
CHORDATA/ ACTINOPTERYGII	*Tor tor*		☐	☐	☐	☐	☐	☐	☐	☑				DD	☐	☐		Crit 8: Migration path and feeding ground.
CHORDATA/ ACTINOPTERYGII	*Xenentodon cancila*		☐	☐	☐	☐	☐	☐	☐	☑				LC	☐	☐		Crit 8: Feeding and spawning ground.
Birds																		
CHORDATA/ AVES	*Anser erythropus*	Lesser White-fronted Goose	☑	☑	☐	☐	☐	☐	☐	☐				VU	☐	☑		Crit 4: Migration
CHORDATA/ AVES	*Aquila clanga*	Greater Spotted Eagle	☑	☑	☐	☐	☐	☐	☐	☐					☐	☐	Vulnerable (VU) as per IUCN Red List	Crit 4: Migration
CHORDATA/ AVES	*Aquila hastata*	Indian Spotted Eagle	☑	☐	☐	☐	☐	☐	☐	☐					☐	☐	Vulnerable (VU) as per IUCN Red List	
CHORDATA/ AVES	*Aquila nipalensis*	Steppe Eagle	☑	☑	☐	☐	☐	☐	☐	☐				EN	☐	☑		Crit 4: Migration
CHORDATA/ AVES	*Aythya baeri*	Baer's Pochard	☑	☑	☐	☐	☐	☐	☐	☐				CR	☐	☑		Crit 4: Migration
CHORDATA/ AVES	*Aythya ferina*	Common Pochard	☑	☑	☐	☐	☐	☐	☐	☐				VU	☐	☐		Crit 4: Migration
CHORDATA/ AVES	*Aythya nyroca*	Ferruginous Duck	☑	☑	☐	☐	☐	☐	☐	☐				NT	☐	☑		Crit 4: Migration
CHORDATA/ AVES	*Ciconia episcopus*	Woolly-necked Stork	☑	☐	☐	☐	☐	☐	☐	☐				VU	☐	☐		
CHORDATA/ AVES	*Gyps bengalensis*	White-rumped Vulture	☑	☐	☐	☐	☐	☐	☐	☐				CR	☐	☑		
CHORDATA/ AVES	*Haliaeetus leucoryphus*	Pallas's Fish Eagle	☑	☐	☐	☐	☐	☐	☐	☐				EN	☐	☑		
CHORDATA/ AVES	*Marmaronetta angustirostris*	Marbled Duck	☑	☑	☐	☐	☐	☐	☐	☐				VU	☐	☑		Crit 4: Migration
CHORDATA/ AVES	*Neophron percnopterus*	Egyptian Vulture	☑	☐	☐	☐	☐	☐	☐	☐				EN	☐	☑		
CHORDATA/ AVES	*Netta rufina*	Red-crested Pochard	☐	☑	☑	☐	☐	☐	☐	☐	1020	2018-2019	1.02	LC	☐	☐		Crit 4: Migration; Crit 6: 1% threshold for South Asia (non-bre) is 1000 as of 2012.

Phylum	Scientific name	Common name	Species qualifies under criterion				Species contributes under criterion				Pop. Size	Period of pop. Est.	% occurrence 1)	IUCN Red List	CITES Appendix I	CMS Appendix I	Other Status	Justification
			2	4	6	9	3	5	7	8								
CHORDATA/ AVES	*Sarcogyps calvus*	Red-headed Vulture	☑	☐	☐	☐	☐	☐	☐	☐				CR	☐	☑		
CHORDATA/ AVES	*Sterna acuticauda*	Black-bellied Tern	☑	☐	☐	☐	☐	☐	☐	☐				EN	☐	☐		
CHORDATA/ AVES	*Tadorna ferruginea*	Ruddy Shelduck	☐	☑	☑	☐	☐	☐	☐	☐	1018	2014-2019	2.03	LC	☐	☐		Crit 4: Migration; Crit 6: 1% threshold for S & SE Asia (non-bre) is 500 as of 2012.

1) Percentage of the total biogeographic population at the site

The Asan Conservation Reserve (ACR) is primarily comprised of a freshwater wetland system. The reservoir was constructed in 1967. Siltation, which was very regular in the 1980s and 1990s,
seemingly stabilized and doesn't seem to be changing much. This is evident from studying the satellite imagery of 1996-98 (Arun Kumar et al., 2000) and 2005 as obtained from
Google Earth. Over all indication is that whatever siltation has taken place in Asan, it has led to creation of habitat diversity in the site. With the emergent vegetation and aquatic succession, it started attracting large variety of birds. It was during this period that the bird numbers increased considerably in Asan. Pallas's fish eagle permanently resides in the reserve. Painted stork remains here during monsoon or rainy season.

3.4 - Ecological communities whose presence relates to the international importance of the site

<no data available>

4 - What is the Site like? (Ecological character description)

4.1 - Ecological character

The Conservation Reserve mainly consists of stretches of rivers Asan and Yamuna river beds, a reservoir area, islands and areas covered with terrestrial vegetation, which include natural forest patch, scrublands and plantation area. The aquatic vegetation of the Asan reservoir mainly comprises of Typha elephantina, Potamogeton pectinatus, Ceratophyllum demersum and Eichhornia crassipes. Of these the Typha elephantina dominated community covers the largest area. The surrounding bushes which are dominant around the reservoir are Xanthium strumarium, Eclipta prostrate, Ipomoea fistulosa, Cyperus spp., Ocimum sanctum, Euphorbia sp., Mimosa pudica, Achyrantus aspera, Polygonum glabrum, P. lanigerum, Aeschynomene sp., Ageratum conyzoides, Phyllanthus sp., Monochoria hestata, Mosla dianthera and Lantana camara. Birds are the most conspicuous of the fauna of Asan. Asan wetland is well known in the entire northern India because of the avian diversity it supports. To date by collating all records about 330 species of birds have been observed at Asan. The area of the reserve is composed of Quaternary group rock type, these are Doon gravel, post Subathu Formation, Sabathu Formations and Green Pyllite. The rock formations in the area include river terraces, gravel and conglomerates of Upper Shiwalik. The left bank of the reservoir (at the side of river Asan) is composed of Upper Shiwalik conglomerates. The right bank of the reservoir (side of river Yamuna) contains patches of Doon gravel with some Upper Shiwalik conglomerates. The area on the other side of river Yamuna is composed of the Lower Shiwalik conglomerates. There are three distinct seasons Winter (October to March), Summer (April to June), Monsoon (July to September). The area has a typical North Indian subtropical climate. The temperature variation is 2 to 38 degree Celsius. The site lies in the lower river basin of River Asan. After the Asan barrage, the River Asan merges with River Yamuna. The entire area comes under Yamuna River Basin, which is a larger river basin. The terrain is essentially flat, but has gentle undulations. There is an irregularity on the surface being formed by the river beds and high banks. Soil of the area is highly organic, with fine granular, clayey and clayey loam, supporting considerable undergrowth. Landslides in the area are very frequent and magnitude of the soil erosion is high. In general, the area of the reserve is a vast alluvial plain with a gentle western slope. The water regime remains almost stable. There is continuous impoundment of water. The water level of the reservoir is maintained and regulated to supply water to two downward hydro power stations. The site provides important ecosystem services in terms of water for energy production, groundwater recharge, biodiversity, scientific and educational support, and recreation and tourism services.

4.2 - What wetland type(s) are in the site?

Inland wetlands

Wetland types (code and name)	Local name	Ranking of extent (1: greatest - 4: least)	Area (ha) of wetland type	Justification of Criterion 1
Fresh water > Flowing water >> M: Permanent rivers/ streams/ creeks		1		

Human-made wetlands

Wetland types (code and name)	Local name	Ranking of extent (1: greatest - 4: least)	Area (ha) of wetland type
6: Water storage areas/Reservoirs	Asan Barrage	2	

Other non-wetland habitat

Other non-wetland habitats within the site	Area (ha) if known
Terrestrial vegetation (including natural forest patch, scrublands and plantation area)	

4.3 - Biological components

4.3.1 - Plant species

Other noteworthy plant species

Scientific name	Common name	Position in range / endemism / other
Typha elephantina	Elephant grass	Dominant grass species.

Invasive alien plant species

Scientific name	Common name	Impacts	
Eichhornia crassipes	Jalkumbhi	Potential	No change
Lantana camara	Lantana	Potential	No change

Optional text box to provide further information

The site is primarily comprised of primary and secondary successions of vegetation as it consist of areas along river beds. Grasses of Saccharum spontaneum, Saccharum arundaceum, Saccharum munja serves good habitat for birds. Dalbergia sissoo and Acacia catechu are primary tree succession species along Yamuna river bed. In the forest patch of Rampurmandi secondary succession tree species Bombex ceiba along with other prominent species of Alangium salviifolium, Albizia altissima, Cordia dichotoma, Casearia tomentosa, Garuga pinnata, Holarrhena pubescens, Lannea coromandelica, Miliusa velutina and Randia dioica.

Pallas's fish eagle is seen perching on the Bombex cieba trees. Ibises, cormorants and egrets form heronries on Salix terasperma growth on island in the main reservoir. Thus, Asan Conservation Reserve is a conglomeration of habitats, known as bird paradise for wintering birds particularly waterbirds. The checklist of plant species of the site is provided in section 6.1.2 i.

4.3.2 - Animal species

Optional text box to provide further information

Herpestes edwardsii (Indian gray mongoose/ Navlaa) and Sus scrofa (Wild boar) are the two prominent animal species found in the Asan conservation reserve. Sus scrofa causes a lot of harm to the agriculture and forest crops.
The checklist of birds of Asan and other other fauna are provided in section 6.1.2 i.

4.4 - Physical components

4.4.1 - Climate

Climatic region	Subregion
C: Moist Mid-Latitude climate with mild winters	Cwa: Humid subtropical (Mild with dry winter, hot summer)

There are three distinct seasons Winter (October to March), Summer (April to June), Monsoon (July to September). The area has a typical North Indian subtropical climate. The temperature variation is 2 to 38 degree Celsius.

The site is in the foothills of outer Shiwalik range of Himalayan mountains. It lies on the left bank of river Yamuna. With global warming and climatic change, cloud burst and flash floods have become frequent. Due to such reasons, the site is susceptible to floods. The flash flood of 1993, eroded 100 meter wide stretch of forest block. Since then river bank protection and training works were done. The successive flash floods also damaged considerably.

4.4.2 - Geomorphic setting

a) Minimum elevation above sea level (in metres): 396

a) Maximum elevation above sea level (in metres): 402

- Entire river basin ☐
- Upper part of river basin ☐
- Middle part of river basin ☑
- Lower part of river basin ☐
- More than one river basin ☑
- Not in river basin ☐
- Coastal ☐

Please name the river basin or basins. If the site lies in a sub-basin, please also name the larger river basin. For a coastal/marine site, please name the sea or ocean.

The site lies in the lower river basin of River Asan. After Asan barrage, River Asan merges with River Yamuna. The entire area comes under Yamuna River Basin, which is a larger river basin.

The terrain is essentially flat, but has gentle undulations. There is an irregularity on the surface being formed by the river beds and high banks.

4.4.3 - Soil

- Mineral ☐
- Organic ☑
- No available information ☐

Are soil types subject to change as a result of changing hydrological conditions (e.g., increased salinity or acidification)? Yes ○ No ◉

Please provide further information on the soil (optional)

Soil of the area is highly organic, with finely granular, clayey and clayey loam, supporting considerable undergrowth. Landslides in the area are very frequent and magnitude of the soil erosion is high. In general, the area of the reserve is a vast alluvial plain with a gentle western slope.

4.4.4 - Water regime

Water permanence

Presence?	
Usually permanent water present	No change

Source of water that maintains character of the site

Presence?	Predominant water source	
Water inputs from precipitation	☐	No change
Water inputs from surface water	☑	No change

Water destination

Presence?	
To downstream catchment	No change

Stability of water regime

Presence?	
Water levels largely stable	No change

Please add any comments on the water regime and its determinants (if relevant). Use this box to explain sites with complex hydrology:

The water regime remains almost stable. There is continuous impoundment of water. The water level of the reservoir is maintained and regulated to supply water to two downward hydro power stations.
The Conservation Reserve is bestowed with two perennial rivers, the Asan and the Yamuna. These rivers act as the major source of water to the wetland. The Asan reservoir contains water throughout the year and is fed by the river Asan and the discharge Power Channel of river Yamuna from Dhalipur Power House. The Asan is a rain-fed river whereas river Yamuna is primarily snow-fed in nature. Of these rivers, Asan has its origin at Chandrabani in Dehradun and reaches the Conservation Reserve flowing through its western half. River Asan has a tributary called Tons (rain-fed), which comes from Mussoorie and ultimately merges with it and reaches the Conservation Reserve. A small part of Yamuna river is included in the Conservation Reserve on its northern side and the interstate boundary located in the middle of the river bed serves as the northern boundary of the Conservation Reserve as well. It has a tributary called Tons (snow-fed), which has catchment in extreme western part of Uttarakhand and adjoining areas of Himachal Pradesh. The River Yamuna is perennial in nature and acts as the source of water for the reservoir through its hydel canal which originates at Dak Patthar nearly 20 km upstream. This Yamuna river segment also serves as an important habitat for many waterbirds.
The river Yamuna constantly changes its course and in places comes up to and cuts away part of the high bank, which as a consequence is extending. This usually happens once in every few years during the monsoon and flashfloods.

(ECD) Connectivity of surface waters and of groundwater	The site lies in the foot hills of outer Himalayas. The surface is bouldery and sandy. The flowing water recharges the groundwater.

4.4.5 - Sediment regime

- [x] Significant erosion of sediments occurs on the site
- [x] Significant accretion or deposition of sediments occurs on the site
- [x] Significant transportation of sediments occurs on or through the site
- [x] Sediment regime is highly variable, either seasonally or inter-annually
- [ ] Sediment regime unknown

Please provide further information on sediment (optional):

Asan reservoir was created in the 1960s and the low lying areas (mostly bouldary river bed) were submerged. Since both the inlets, viz. the Yamuna hydel canal and the Asan river, carry heavy silt load during the monsoons, the backwaters of this reservoir started silting up as the stagnant water released the silt it was carrying. As expected, siltation did not take place in areas where there was steady water flow. It was this siltation in the backwaters which led to colonization by vegetation and typical aquatic succession took place. Today most of these silted up areas support emergent vegetation dominated by Typha elephantina. The oldest silted up areas in the north-eastern part of the reservoir which are small in extent is dominated with non-aquatic vegetation with species like Lantana. Few young trees of Semal (Bombax cieba) have established here.

(ECD) Water turbidity and colour	No turbidity and normal colour
(ECD) Light - reaching wetland	Fairly constant round the year.
(ECD) Water temperature	9 to 26 centigrade

4.4.6 - Water pH

- [ ] Acid (pH<5.5)
- [x] Circumneutral (pH: 5.5-7.4)
- [ ] Alkaline (pH>7.4)
- [ ] Unknown

4.4.7 - Water salinity

- [x] Fresh (<0.5 g/l)
- [ ] Mixohaline (brackish)/Mixosaline (0.5-30 g/l)
- [ ] Euhaline/Eusaline (30-40 g/l)
- [ ] Hyperhaline/Hypersaline (>40 g/l)
- [ ] Unknown

Please provide further information on salinity (optional):

4.4.8 - Dissolved or suspended nutrients in water

- [ ] Eutrophic
- [ ] Mesotrophic

Oligotrophic ☐

Dystrophic ☐

Unknown ☑

Please provide further information on dissolved or suspended nutrients (optional):

The mean value of heavy and trace metals is within the permissible limit.

4.4.9 - Features of the surrounding area which may affect the Site

Please describe whether, and if so how, the landscape and ecological characteristics in the area surrounding the Ramsar Site differ from the site itself: i) broadly similar ○ ii) significantly different ◉

Surrounding area has greater urbanisation or development ☐

Surrounding area has higher human population density ☑

Surrounding area has more intensive agricultural use ☑

Surrounding area has significantly different land cover or habitat types ☑

Please describe other ways in which the surrounding area is different:

Asan Conservation Reserve basically constitutes a reservoir, constructed with the object of providing and regulating water to the downstream hydro power stations of Kulhal and Khara. All along the conservation reserve there are villages and agriculture fields. The river Yamuna forms the northern boundary and beyond that there is territory of Himachal Pradesh where there is large scale mining activity. On the west, north east and eastern side, heavily populated villages of Kulhal, Dhakrani and Dhalipur are situated. Agriculture is predominantly practised there. Kunja and Kunja Grant villages lies on the southern boundary. Further south there is a good mixed forest, predominantly of Sal (Shorea robusta).

4.5 - Ecosystem services

4.5.1 - Ecosystem services/benefits

Provisioning Services

Ecosystem service	Examples	Importance/Extent/Significance
Food for humans	Sustenance for humans (e.g., fish, molluscs, grains)	High
Fresh water	Water for energy production (hydro-electricity)	High

Regulating Services

Ecosystem service	Examples	Importance/Extent/Significance
Maintenance of hydrological regimes	Storage and delivery of water as part of water supply systems for agriculture and industry	High
Maintenance of hydrological regimes	Groundwater recharge and discharge	High

Cultural Services

Ecosystem service	Examples	Importance/Extent/Significance
Recreation and tourism	Nature observation and nature-based tourism	High
Scientific and educational	Important knowledge systems, importance for research (scientific reference area or site)	High

Supporting Services

Ecosystem service	Examples	Importance/Extent/Significance
Biodiversity	Supports a variety of all life forms including plants, animals and microorganizms, the genes they contain, and the ecosystems of which they form a part	High

Within the site: 100

Outside the site: 25000

Have studies or assessments been made of the economic valuation of ecosystem services provided by this Ramsar Site? Yes ○ No ◉ Unknown ○

4.5.2 - Social and cultural values

i) the site provides a model of wetland wise use, demonstrating the application of traditional knowledge and methods of management and use that maintain the ecological character of the wetland ☐

ii) the site has exceptional cultural traditions or records of former civilizations that have influenced the ecological character of the wetland ☐

iii) the ecological character of the wetland depends on its interaction with local communities or indigenous peoples ☐

iv) relevant non-material values such as sacred sites are present and their existence is strongly linked with the maintenance of the ecological character of the wetland ☐

<no data available>

4.6 - Ecological processes

<no data available>

5 - How is the Site managed? (Conservation and management)

5.1 - Land tenure and responsibilities (Managers)

5.1.1 - Land tenure/ownership

Public ownership

Category	Within the Ramsar Site	In the surrounding area
Provincial/region/state government	☑	☑

Private ownership

Category	Within the Ramsar Site	In the surrounding area
Other types of private/individual owner(s)	☐	☑

Provide further information on the land tenure / ownership regime (optional):

Asan Conservation Reserve have multiple tenure. Despite having a very small area, there are a number of agencies which control or use the land resources of the Reserve. These include the Uttarakhand Jal Vidyut Nigam Limited (UJVNL), the Forest Department, the Forest Development Corporation, the Tourism Department (through Garhwal Mandal Vikas Nigam), surrounding villages which own some areas of the Reserve as Gram Samaj lands, private land owners practicing subsistence agriculture on the land pattas allotted to them etc. There are issues that come up regularly and are sorted out amicably. They all support in the management of wildlife, the avifaunal diversity.

5.1.2 - Management authority

Please list the local office / offices of any agency or organization responsible for managing the site:	1. Forest Department. 2. Uttarakhand Jal Vidyut Nigam Limited, UJVNL. 3. Revenue Department. 4. Uttarakhand Forest Development Corporation. 5. Tourism Department (through Garhwal Mandal Vikas Nigam)
Provide the name and/or title of the person or people with responsibility for the wetland:	Deep Chandra Arya, IFS, Divisional Forest Officer, Chakrata Forest Division, Kalsi.
Postal address:	Divisional Forest Officer, Chakrata Forest Division, Kalsi. Post Kalsi Gate. Disrict Dehradun. Uttarakhand. India. PIN 248159
E-mail address:	dfo_chakrata_uta@yahoo.co.in

5.2 - Ecological character threats and responses (Management)

5.2.1 - Factors (actual or likely) adversely affecting the Site's ecological character

Human settlements (non agricultural)

Factors adversely affecting site	Actual threat	Potential threat	Within the site	In the surrounding area
Housing and urban areas		Low impact	☐	☑
Tourism and recreation areas	Low impact		☑	☐

Water regulation

Factors adversely affecting site	Actual threat	Potential threat	Within the site	In the surrounding area
Dredging	Low impact		☑	☑
Canalisation and river regulation	Low impact		☑	☑
Water releases	Low impact		☑	☑
Drainage	Low impact		☑	☑
Water abstraction	Low impact		☑	☑

Agriculture and aquaculture

Factors adversely affecting site	Actual threat	Potential threat	Within the site	In the surrounding area
Livestock farming and ranching		Low impact	☐	☑

Energy production and mining

Factors adversely affecting site	Actual threat	Potential threat	Within the site	In the surrounding area
Renewable energy		Low impact	☐	☑

Transportation and service corridors

Factors adversely affecting site	Actual threat	Potential threat	Within the site	In the surrounding area
Roads and railroads	Low impact		☑	☑

Human intrusions and disturbance

Factors adversely affecting site	Actual threat	Potential threat	Within the site	In the surrounding area
Recreational and tourism activities	Low impact		☑	☐

Natural system modifications

Factors adversely affecting site	Actual threat	Potential threat	Within the site	In the surrounding area
Dams and water management/use	Low impact		☑	☐

Invasive and other problematic species and genes

Factors adversely affecting site	Actual threat	Potential threat	Within the site	In the surrounding area
Invasive non-native/ alien species	Low impact		☑	☐

Pollution

Factors adversely affecting site	Actual threat	Potential threat	Within the site	In the surrounding area
Household sewage, urban waste water		Low impact	☐	☑
Agricultural and forestry effluents		Low impact	☐	☑

Geological events

Factors adversely affecting site	Actual threat	Potential threat	Within the site	In the surrounding area
Earthquakes/tsunamis		Medium impact	☑	☑

Climate change and severe weather

Factors adversely affecting site	Actual threat	Potential threat	Within the site	In the surrounding area
Storms and flooding		Low impact	☑	☑

5.2.2 - Legal conservation status

National legal designations

Designation type	Name of area	Online information url	Overlap with Ramsar Site
Conservation Reserve	Asan Conservation Reserve, Rampurmandi		whole

Non-statutory designations

Designation type	Name of area	Online information url	Overlap with Ramsar Site
Important Bird Area	Asan Barrage	http://datazone.birdlife.org/site/factsheet/asan-barrage-iba-ind ia	whole

5.2.3 - IUCN protected areas categories (2008)

Ia Strict Nature Reserve ☐

Ib Wilderness Area: protected area managed mainly for wilderness protection ☐

II National Park: protected area managed mainly for ecosystem protection and recreation ☐

III Natural Monument: protected area managed mainly for conservation of specific natural features ☐

IV Habitat/Species Management Area: protected area managed mainly for conservation through management intervention ☑

V Protected Landscape/Seascape: protected area managed mainly for landscape/seascape conservation and recreation ☐

VI Managed Resource Protected Area: protected area managed mainly for the sustainable use of natural ecosystems ☐

5.2.4 - Key conservation measures

Legal protection

Measures	Status
Legal protection	Implemented

Habitat

Measures	Status
Catchment management initiatives/controls	Partially implemented
Improvement of water quality	Proposed
Habitat manipulation/enhancement	Partially implemented
Soil management	Partially implemented

Species

Measures	Status
Threatened/rare species management programmes	Implemented
Control of invasive alien plants	Implemented

Human Activities

Measures	Status
Management of water abstraction/takes	Implemented
Regulation/management of wastes	Proposed
Harvest controls/poaching enforcement	Implemented
Research	Proposed
Regulation/management of recreational activities	Implemented
Communication, education, and participation and awareness activities	Implemented

5.2.5 - Management planning

Is there a site-specific management plan for the site? Yes

Has a management effectiveness assessment been undertaken for the site? Yes ○ No ◉

If the site is a formal transboundary site as indicated in section Data and location > Site location, are there shared management planning processes with another Contracting Party? Yes ○ No ◉

5.2.6 - Planning for restoration

Is there a site-specific restoration plan? No need identified

5.2.7 - Monitoring implemented or proposed

Monitoring	Status
Water regime monitoring	Implemented
Water quality	Proposed
Plant community	Implemented
Plant species	Implemented
Animal community	Implemented
Birds	Implemented
Soil quality	Proposed

6 - Additional material

6.1 - Additional reports and documents

6.1.1 - Bibliographical references

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Kumar, A. and Gaurav Sharma. 2003. Insecta: Odonata in Fauna of Asan Wetland, in Wetland Ecosystem series 5, Zoological Survey of India. Ed. Tak, P.C., J.P. Sati and A. Kumar (2003).
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Mitra, A. 1999. Studies on behavioural patterns and seasonal ecology of some species of Dragonflies (Odonata: Insecta) in Asan reservoir (Dehradun: India). PhD. Thesis submitted to the H.N.B. Garhwal University, Srinagar (Garhwal) 1999.
Mohan, D. 1989. Falcated Teal in Dehradun. Newsletter for Birdwatchers, 29 (5-6): 9.
Mohan, D., Nitin. D. Rai and Arun P. Singh 1992. Longtailed Duck Clangula hyemalis in Dehra Dun. Jointl

6.1.2 - Additional reports and documents

i. taxonomic lists of plant and animal species occurring in the site (see section 4.3)
<3 file(s) uploaded>

ii. a detailed Ecological Character Description (ECD) (in a national format)
<no file available>

iii. a description of the site in a national or regional wetland inventory
<no file available>

iv. relevant Article 3.2 reports
<no file available>

v. site management plan
<1 file(s) uploaded>

vi. other published literature
<4 file(s) uploaded>

6.1.3 - Photograph(s) of the Site

Please provide at least one photograph of the site:


Ruddy shelduck at Asan (*Deep Chandra Arya, 02-12-2017*)


Ruddy shelduck at Asan (*Deep Chandra Arya, 02-12-2017*)


Bar headed Goose at Asan (*Deep Chandra Arya, 02-12-2017*)


Common Pochard at Asan (*Deep Chandra Arya, 02-12-2017*)


Indian Spot-billed Duck at Asan (*Deep Chandra Arya, 05-06-2018*)


Painted Stork at Asan (*Deep Chandra Arya, 02-02-2018*)


Landscape view of Asan (*Deep Chandra Arya, 25-03-2019*)


Landscape view of Asan (*Deep Chandra Arya, 08-10-2019*)


Landscape view of Asan (*Deep Chandra Arya, 31-05-2020*)


Landscape view of Asan (*Deep Chandra Arya, 01-05-2017*)

6.1.4 - Designation letter and related data

Designation letter

<1 file(s) uploaded>

Date of Designation	2020-07-21