



Ramsar Information Sheet

Published on 11 November 2020

India Lonar Lake



Designation date	22 July 2020
Site number	2441
Coordinates	19°58'33"N 76°30'30"E
Area	427,00 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

Lonar wetland is a natural, saline lake situated in Buldhana district of the state of Maharashtra that was formed by meteorite impact in the Deccan Trap region, composed of basaltic flows. Almost circular in shape, the depression is surrounded by steeply rising escarpments, lying amongst the vast monotonous plateau. The drainage is endorheic with natural springs and precipitation as major sources of the water. Circumference of the wetland along its outer rim is 600 hectares. The water is high of salinity as well as alkalinity with a maximum depth of 5.50 m. Towards the north east, the scarp slope is breached by a gully, making accessibility to wetland easier. The unique sodic ecosystem supports a unique blend of microorganisms, ranging from anaerobes to cyanobacteria and planktons. Besides, the wetland also supports nearly 30 species of trees, 10 species of shrubs, 13 species of climbers, 8 species of herbs and 6 species of grasses. Faunal diversity includes 12 species of mammals, 160 species of birds, 46 species of reptiles, 7 species of amphibians and 14 species of molluscs. The wetland forms an important wintering site for the migratory bird species of Central Asian Flyway. Also, the site has high archaeological, cultural and spiritual significance with 27 temples, 3 monuments, 7 temple tanks and 3 inscriptions inside the crater.

2 - Data & location

2.1 - Formal data

2.1.1 - Name and address of the compiler of this RIS

Responsible compiler

Institution/agency

Postal address

National Ramsar Administrative Authority

Institution/agency

Postal address

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

From year

To year

2.1.3 - Name of the Ramsar Site

Official name (in English, French or Spanish)

Unofficial name (optional)

2.2 - Site location

2.2.1 - Defining the Site boundaries

b) Digital map/image

<1 file(s) uploaded>

Former maps

Boundaries description

The Ramsar site boundaries coincides with those of Wildlife Sanctuary. Lonar wetland has habitations like villages of Lonar, Lonai, Patel nagar, Sabunpura and a road in the north east. Agricultural fields forms the Eastern, Western and Northern boundaries.

2.2.2 - General location

a) In which large administrative region does the site lie?

b) What is the nearest town or population centre?

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):

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

2.2.5 - Biogeography

Biogeographic regions

Regionalisation scheme(s)	Biogeographic region
Other scheme (provide name below)	6 Deccan Peninsula Zone
Freshwater Ecoregions of the World (FEOW)	Northern Deccan plateau

[Other biogeographic regionalisation scheme](#)

Lonar Wildlife Sanctuary falls under 6 Deccan Peninsula Zone (Largest Biogeographic Zone of India with 41.99% of total land area) and further under 6D Central Plateau Province (second largest Biogeographic Province in India with 12.5% of the total land area) of Biogeographic Classification of India. The Biogeographic Classification of India was done by Rodgers and Panwar (1988) using various factors such as altitude, moisture, topography, rainfall etc. into 10 Biogeographic zones and 25 Biogeographic Provinces in India. Rodgers, Panwar and Mathur (2002) further revised this classification divided India into 10 Biogeographic Zones and 26 Biogeographic Province using GPS techniques.

3 - Why is the Site important?

3.1 - Ramsar Criteria and their justification

- Criterion 1: Representative, rare or unique natural or near-natural wetland types

Hydrological services provided

The hydrological input and output in Lonar Lake has not been fully understood, but it is certain that the input from monsoon precipitation in the catchment area including the lake surface is important, and groundwater is also potentially important for the Lonar Lakes hydrological balance. The groundwater contributes from the springs, which emerges on the surface. One spring reaches from a deep-water table at or below the lake level, which appears to be controlled by a basaltic layer of diverse porosity and permeability. Valleys formed due to surface runoff from the crater rim (like the sloping Dhar valley) collects the water during rainy season. During the dry season, the lake continuously receives groundwater input, but the evaporation from the lake exceeds the input, causing the level to drop. The presence of vesicular (Higher Permeability) and massive (Lower Permeability) units in Basaltic rock gives rise to water bearing formations in the form of multi-layered aquifer systems in Lonar lake (Central Ground Water Board, 2007). Lonar being a hydrologically endorheic basin retains water and allows no outflow to other external bodies of water, such as rivers. It equilibrates through evaporation and some seepage. As the inland saline lake has a pH of more than 10.5, its water is not used for drinking, agriculture and industry. However, it provides hydrological services like local climate regulation, sediment retention, nutrient recycling and accumulation of organic matter.

Other ecosystem services provided

The wetland provides a number of Provisioning, Regulating, Supporting as well as Cultural services. Genetic material and biochemical substances are sourced for research and other purposes. The wetland plays a major role in the maintenance of hydrological regimes, erosion protection and micro-regulation protection. It also supports a rich microbial diversity and helps in sediment retention. The site is known for tourism and recreation and has spiritual value attached to it with presence of temples and archaeological sites on the shores.

Other reasons

A unique example of terrestrial impact craters formed in basaltic bedrock, with relatively pristine morphology, high alkalinity and salinity, constantly elevated temperature, and an extreme aquatic habitat and therefore depauperate but interesting flora and fauna. These are some other reasons which make Lonar lake unique.

- Criterion 2 : Rare species and threatened ecological communities

- Criterion 3 : Biological diversity

Justification

This complex and unique ecosystem of Lonar wetland supports interesting biodiversity. The most striking among which is its Blue Green algae and bacteria. These microscopic forms have adapted to thrive in an extremely alkaline medium, where normally no life forms could hope to survive. Diverse anaerobic microorganisms, including methanogens and alkalophilic bacteria, have been found from the bottom water of the wetland and the sediments. Bacterioplanktons include extremophiles, alkalophilic and halophilic bacteria with *Arthrobacter* spp., *Bacillus cereus*, *Bacillus laterosporous*, *Citrobacter freundii* etc. having been reported from the site. Besides, the wetland also supports about 10-20 species of phytoplanktons. The algal species of Cyanophyceae group, Bacillariophyceae (diatoms) and Chlorophyceae (green algae) are found in the lake. The species diversity decreases towards the centre of the lake as salinity-alkalinity increases. The Zooplankton community is represented by Rotifers, Ostracods, Watermites, Arachnids, and Diptera. Two species of neuston are also found in the Lonar lake.

The wetland is a part of Lonar wildlife sanctuary that also supports 12 species of mammals, 160 species of birds, 46 species of reptiles, 7 species of amphibians and 14 species of molluscs. Also, nearly 30 species of trees, 10 species of shrubs, 13 species of climbers, 8 species of herbs and 6 species of grasses have been reported from the area.

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

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

Scientific name	Common name	Criterion 2	Criterion 3	Criterion 4	IUCN Red List	CITES Appendix I	Other status	Justification
Plantae								
<i>Santalum album</i>	Indian Sandalwood	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	VU	<input checked="" type="checkbox"/>		Wetland provides habitat to this vulnerable and commercially important species, native to South and South-east Asia

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								
Others																		
CHORDATA / MAMMALIA	<i>Canis lupus lupus</i>	Grey Wolf	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input checked="" type="checkbox"/>	<input type="checkbox"/>		Wetland provides habitat to species is protected under schedule 1 of Indian Wildlife Protection Act, 1972 and appendix 1 of CITES
Birds																		
CHORDATA / AVES	<i>Anas acuta</i>	Northern Pintail	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>		Wetland is a wintering site for the species
CHORDATA / AVES	<i>Anas clypeata</i>	Northern Shoveler	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>		Wetland is a wintering site for the species
CHORDATA / AVES	<i>Anas penelope</i>	Eurasian Wigeon	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>		Wetland is a wintering site for the species
CHORDATA / AVES	<i>Anas platyrhynchos</i>	Mallard	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>		Wetland is a wintering site for the species

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								
CHORDATA / AVES	<i>Anas querquedula</i>	Garganey	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					<input type="checkbox"/>	<input type="checkbox"/>		Wetland is a wintering site for the species
CHORDATA / AVES	<i>Anastomus oscitans</i>	Asian Openbill	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>		Wetland provides habitat for the species which is native to Indian sub-continent and South-east Asia
CHORDATA / AVES	<i>Aythya ferina</i>	Common Pochard	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				VU	<input type="checkbox"/>	<input type="checkbox"/>		Wetland is a wintering site for the species
CHORDATA / AVES	<i>Aythya fuligula</i>	Tufted Duck	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>		Wetland is a wintering site for the species
CHORDATA / AVES	<i>Ciconia episcopus</i>	Woolly-necked Stork	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				VU	<input type="checkbox"/>	<input type="checkbox"/>		wetland provides habitat for the species which generally use the site for breeding.
CHORDATA / AVES	<i>Circus aeruginosus</i>	Western Marsh Harrier	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>		Wetland is a wintering site for the species
CHORDATA / AVES	<i>Netta rufina</i>	Red-crested Pochard	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>		Wetland is a wintering site for the species
CHORDATA / AVES	<i>Platalea leucorodia</i>	Eurasian Spoonbill	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>		Wetland is a wintering site for the species
CHORDATA / AVES	<i>Tachybaptus ruficollis</i>	Little Grebe	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>		wetland provides habitat for the smallest grebe species found in India
CHORDATA / AVES	<i>Tadorna ferruginea</i>	Ruddy Shelduck	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>		Wetland provides wintering site for the species
CHORDATA / AVES	<i>Threskiornis melanocephalus</i>	Black-headed Ibis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				NT	<input type="checkbox"/>	<input type="checkbox"/>		Wetland provides habitat for the species. Species is extant resident in India, Indonesia and Russian federation.
CHORDATA / AVES	<i>Tringa totanus</i>	Common Redshank	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC	<input type="checkbox"/>	<input type="checkbox"/>		Wetland is a wintering site for the species

1) Percentage of the total biogeographic population at the site

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

Situated in Buldhana district, Lonar lake is nearly circular except at the northern-eastern side, where gully erosion caused by the stream 'Dhara' has created small mud-flats. The depression is surrounded by steep escarpments. Since the drainage is endorheic, there is no outflow of water. A large portion of the lake is rather shallow, preserving about 2 meters of water during the monsoon months. The inner portions of lake are characterized by hyper saline, hyper alkaline waters, making it habitable only by resistant microbes like methanogens and alkalophilic bacteria. Bacterioplankton include extremophiles, alkalophilic and halophilic bacteria namely *Arthrobacter* spp., *Bacillus cereus*, *Bacillus laterosporus*, *Citrobacter freundii*, *Micrococcus agilis*, *Pseudomonas putida*, and *Pseudomonas pseudoalcaligenes*. The entire water spread is blanketed by filamentous algae due to year round algal-bloom. About 10-20 species of phytoplanktons have been recorded. The algal species of Cyanophyceae (blue-green algae) group found to be dominating the phytoplankton population in Lonar lake, followed by Bacillariophyceae (diatoms) and Chlorophyceae (green algae). The *Spirulina* sp. is dominant one followed by *Oscillatoria* and *Chroococcus*. The species diversity decreases towards the centre of the lake as salinity-alkalinity increases. The wetlands presents a mosaic of habitats with fresh water dominating near the rim and hyper saline-alkaline waters near the core. The basin area is characterized by dry deciduous vegetation with scattered patches of semi-evergreen flora. The eastern and northeastern parts of the lake basin support a good amount of freshwater marshy vegetation on the mud flats, formed due to the in-flowing springs. These varied habitats support nearly 12 species of mammals, 160 species of birds, 46 species of reptiles, 7 species of amphibians and 14 species of mollusks. Besides, nearly 30 species of trees, 10 species of shrubs, 13 species of climbers, 8 species of herbs and 6 species of grasses have also been reported making the wetland rich in biodiversity. The most striking feature of the lake is its extreme salinity and high alkalinity (pH 11). It is attributed to the high concentration of salts like sodium chloride, carbonate, bicarbonate and fluoride, which come from small streams joining the crater. As the water does not drain away these substances settled beneath the surface. The lake has two parts with different chemical composition. The inner part (Alkaline) with pH 11 and the outer part (Neutral) pH 7, each bearing distinct flora and fauna.

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
Saline, brackish or alkaline water > Lakes >> Q: Permanent saline/brackish/alkaline lakes		1		Unique

4.3 - Biological components

4.3.1 - Plant species

Other noteworthy plant species

Scientific name	Common name	Position in range / endemism / other
<i>Azadirachta indica</i>	Indian liliac	Species is native to Indian subcontinent and is known for medicinal properties.
<i>Boswellia serrata</i>	Indian oilbanum	Species is threatened and medicinally important
<i>Butea monosperma</i>	Bastard Teak;Bengal Kino;Flame Of The Forest	Native to India, species is culturally important
<i>Cordia macleodii</i>	Dhaipalpas	Species is an endangered medicinal plant in state of Odisha
<i>Ficus benghalensis</i>	Indian banyan	Native to Indian sub-continent, species is National tree of India
<i>Hardwickia binata</i>	Indian blackwood	Species is endemic to Indian subcontinent
<i>Polyalthia longifolia</i>	False ashoka	Species is native to drier regions of India and is used in indigenous medicine.
<i>Tectona grandis</i>	Teak	commercially important species native to South Asia and South east Asia
<i>Terminalia bellirica</i>	Behada	Native to Asia, species is used in Indian traditional medicine system

Invasive alien plant species

Scientific name	Common name	Impacts	
<i>Lantana angustifolia</i>		Actual (minor impacts)	No change

4.3.2 - Animal species

Other noteworthy animal species

Phylum	Scientific name	Common name	Pop. size	Period of pop. est.	%occurrence	Position in range /endemism/other
CHORDATA/MAMMALIA	<i>Canis lupus</i>	Gray Wolf;Wolf	10	2017-18		Native to Indian plains, species is protected under schedule 1 of Indian Wildlife Protection Act, 1972 and appendix 1 of CITES
CHORDATA/REPTILIA	<i>Eryx conicus</i>	Common Sand Boa;Rough-tailed Sand Boa				Endemic to India
CHORDATA/MAMMALIA	<i>Felis chaus</i>	Jungle Cat	25	2017-18		Species is native to the Middle East, South and Southeast Asia and southern China. It inhabits wetlands
CHORDATA/MAMMALIA	<i>Funambulus palmarum</i>	Indian Palm Squirrel				Species is naturally found in India and Sri-lanka
CHORDATA/MAMMALIA	<i>Herpestes edwardsi</i>	Common mongoose	15	2017-18		Species is native to Indian Subcontinent and West Asia
CHORDATA/MAMMALIA	<i>Hyaena hyaena</i>	Striped Hyena	15	2017-18		Large carnivore which is protected under schedule 3 of wildlife protection act, 1972
CHORDATA/REPTILIA	<i>Indotyphlops braminus</i>	Bootslace Snake;Brahminy blindsnake;Flowerpot Snake				Blind, female only species found throughout the country
CHORDATA/MAMMALIA	<i>Muntiacus muntjak muntjak</i>	Barking deer	25	2017-18		Species is native to South and South east Asia
CHORDATA/REPTILIA	<i>Naja naja</i>	Indian Cobra				Native to Indian Subcontinent, species is listed under CITES
CHORDATA/MAMMALIA	<i>Rousettus leschenaultii</i>	Fulvous Fruit Bat				Species is native to South and South east Asia
CHORDATA/MAMMALIA	<i>Semnopithecus entellus</i>	Bengal Sacred Langur;Northern Plains Gray Langur	70	2017-18		Species is native to Indian Subcontinent
CHORDATA/REPTILIA	<i>Varanus bengalensis</i>	Bengal Monitor;Indian Monitor				Species is native to Indian Sub-continent, Parts of South East and West Asia
CHORDATA/REPTILIA	<i>Xenochrophis piscator</i>	Asiatic Water Snakes;Checked Keelback				Species is endemic to Asia

Optional text box to provide further information

4.4 - Physical components

4.4.1 - Climate

Climatic region	Subregion
A: Tropical humid climate	Aw: Tropical savanna (Winter dry season)

Observations indicate that the water of Lonar wetland is getting gradually diluted for its salinity and alkalinity. The reasons for this phenomenon have been attributed to the rise in the water level mainly due to high precipitation during 1987-1991 monsoons. In 1985 the water level in the wetland was so less that a great extent of the basin got exposed along with the encrustation of salt. However, in the span of about five years there has been considerable increase in the water level inundating most of the lake basin consequently killing hundreds of Acacia Nilotica trees due to perpetual water logging (Badve et.al, 1993). The seepage from the nearby freshwater reservoir built for irrigation is also attributed to rise in water level of the lake (Mahabal, 2008).

The temperature of the region ranges from 43° Celsius to 9.6 ° Celsius. The rainfall is between 600-800 mm.

4.4.2 - Geomorphic setting

a) Minimum elevation above sea level (in metres)

a) Maximum elevation above sea level (in metres)

- 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

4.4.3 - Soil

- Mneral
- 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)

Zinc: - 0.152 ppm
 Lead: - 0.130 ppm
 Cadmium: - 0.069 ppm
 Nickel: - 0.162 ppm
 Cobalt: -0.01 ppm
 Manganese: - 0.076 ppm
 Iron: - 1.79 ppm

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	<input checked="" type="checkbox"/>	No change
Water inputs from groundwater	<input checked="" type="checkbox"/>	No change

Water destination

Presence?	
Unknown	No change
Feeds groundwater	No change

Stability of water regime

Presence?	
Water levels largely stable	No change

4.4.5 - Sediment regime

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

(EOD) Water turbidity and colour	Turbidity ranges -148.1 - 159.0 NTU Color of the lake is light green to dark green due to presence of algae.
(EOD) Water temperature	26.5 oC

4.4.6 - Water pH

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

Please provide further information on pH (optional):

Lonar lake is a hydrologically closed basin, located in an arid region, which has exceedingly high range of pH values because of high natural concentrations of soda (Na₂CO₃) and other salts, chloride, sodium, calcium etc. The pH range of Lonar lake is between 9-10.5 and shows pronounced seasonality. However, the comparative pH values for subterranean pits dug few meters from the lake are in the range of 7.6-7.8 (Siddiqi, 2008).

4.4.7 - Water salinity

- Fresh (<0.5 g/l)
- Mxohaline (brackish)/Mxosaline (0.5-30 g/l)
- Euhaline/Eusaline (30-40 g/l)
- Hyperhaline/Hypersaline (>40 g/l)
- Unknown

Please provide further information on salinity (optional):

The reported salinity of Lonar lake is 2300-3900 mg/l (Siddiqi, 2008), 3120-5197 (Karwlar et.al, 2008), 412-6023 mg/l (Yannawar and Bhosale, 2013), 8460-10240 mg/l (Borul, 2012) indicates that the water salinity of Lonar lake is to be considered as Mixohaline (brakish)/Mixohaline (0.5-30 g/l). The spatial and temporal variation in water salinity is also found in the lake. The water salinity decreases from the centre to periphery of the lake. Also, the water salinity increases from the monsoon to pre monsoon season. However, a review of literature revealed that its salinity was decreasing day-by-day (Yannawar & Bhosle, 2013).

4.4.8 - Dissolved or suspended nutrients in water

- Eutrophic
- Mesotrophic
- Oligotrophic
- Dystrophic
- Unknown

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

Phosphorus values in orthophosphate (P-PO4) form and Nitrogen values in nitrate (N-NO3) form were between 0.25-0.56 mg/l and 13.7-19.4 mg/l respectively (Dabhade, 2013) in Lonar lake water indicates eutrophication trends in the lake.

(EOD) Dissolved organic carbon **Absent**

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 i) broadly similar ii) significantly different site itself.

- 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

4.5 - Ecosystem services

4.5.1 - Ecosystem services/benefits

Provisioning Services

Ecosystem service	Examples	Importance/Extent/Significance
Biochemical products	Extraction of material from biota	Low
Genetic materials	Genes for tolerance to certain conditions (e.g., salinity)	High

Regulating Services

Ecosystem service	Examples	Importance/Extent/Significance
Maintenance of hydrological regimes	Groundwater recharge and discharge	Medium
Erosion protection	Soil, sediment and nutrient retention	High
Climate regulation	Local climate regulation/buffering of change	Low

Cultural Services

Ecosystem service	Examples	Importance/Extent/Significance
Recreation and tourism	Nature observation and nature-based tourism	High
Recreation and tourism	Picnics, outings, touring	High
Spiritual and inspirational	Cultural heritage (historical and archaeological)	Medium
Spiritual and inspirational	Spiritual and religious values	Medium
Spiritual and inspirational	Aesthetic and sense of place values	High
Scientific and educational	Educational activities and opportunities	High
Scientific and educational	Important knowledge systems, importance for research (scientific reference area or site)	High
Scientific and educational	Long-term monitoring site	High
Scientific and educational	Major scientific study site	High

Supporting Services

Ecosystem service	Examples	Importance/Extent/Significance
Biodiversity	Supports a variety of all life forms including plants, animals and microorganisms, the genes they contain, and the ecosystems of which they form a part	Medium
Soil formation	Sediment retention	High
Soil formation	Accumulation of organic matter	High
Nutrient cycling	Storage, recycling, processing and acquisition of nutrients	High
Nutrient cycling	Carbon storage/sequestration	High

Within the site: 8000

Outside the site: 23416

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

Description if applicable

There are 27 temples, 3 monuments, 7 temple tanks and 3 inscriptions inside the Lonar wetland crater, build mostly by Yadava rulers. Historically significant, these temples see regular fairs and rituals being held.

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	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Other public ownership	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Private ownership

Category	Within the Ramsar Site	In the surrounding area
Other types of private/individual owner(s)	<input type="checkbox"/>	<input checked="" type="checkbox"/>

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

Lonar wetland was designated as Wildlife Sanctuary in 2000. The administration and management of this sanctuary and wetland is within the jurisdiction of Additional Chief Conservator of Forest, Melghat Tiger Project, Amravati. Divisional Forest Officer, Akola is overall in charge of the administration and management of the sanctuary area. The area within the sanctuary are Reserve Forests (in possession of Forest Department), Private land and Revenue land (Area under the lake and under the control of Archeological Dept). The private land included in the sanctuary area are the cultivable areas of private owners of the Lonar village situated on the periphery of sanctuary. Total area under this category is 21.39 ha.

5.1.2 - Management authority

Please list the local office / offices of any agency or organization responsible for managing the site:

Office of Divisional Forest Officer Wildlife Akola Division, Akola

Provide the name and/or title of the person or people with responsibility for the wetland:

Mr. M.N. Khaimar, Divisional Forest Officer

Postal address:

Katepurna Bhavan, DFO Office, Wildlife Division, Station Road, Akola-444005

E-mail address:

dcfwakola@gmail.com

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	Medium impact		<input type="checkbox"/>	<input checked="" type="checkbox"/>
Commercial and industrial areas	Low impact		<input type="checkbox"/>	<input checked="" type="checkbox"/>
Tourism and recreation areas	Medium impact		<input checked="" type="checkbox"/>	<input type="checkbox"/>

Water regulation

Factors adversely affecting site	Actual threat	Potential threat	Within the site	In the surrounding area
Drainage	Low impact		<input type="checkbox"/>	<input checked="" type="checkbox"/>
Water releases	Low impact		<input type="checkbox"/>	<input checked="" type="checkbox"/>

Agriculture and aquaculture

Factors adversely affecting site	Actual threat	Potential threat	Within the site	In the surrounding area
Livestock farming and ranching	Low impact		<input checked="" type="checkbox"/>	<input type="checkbox"/>

Transportation and service corridors

Factors adversely affecting site	Actual threat	Potential threat	Within the site	In the surrounding area
Roads and railroads	Low impact		<input type="checkbox"/>	<input checked="" type="checkbox"/>

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		<input checked="" type="checkbox"/>	<input type="checkbox"/>
Unspecified/others	Low impact		<input checked="" type="checkbox"/>	<input type="checkbox"/>

Pollution

Factors adversely affecting site	Actual threat	Potential threat	Within the site	In the surrounding area
Household sewage, urban waste water	High impact		<input checked="" type="checkbox"/>	<input type="checkbox"/>
Agricultural and forestry effluents	Low impact		<input checked="" type="checkbox"/>	<input type="checkbox"/>

Climate change and severe weather

Factors adversely affecting site	Actual threat	Potential threat	Within the site	In the surrounding area
Droughts	Low impact		<input checked="" type="checkbox"/>	<input type="checkbox"/>

5.2.2 - Legal conservation status

National legal designations

Designation type	Name of area	Online information url	Overlap with Ramsar Site
National Geo-heritage site	Lonar lake		whole
Wildlife Sanctuary	Lonar Wildlife Sanctuary	http://wiienviis.nic.in/WriteReadData/UserFiles/file/maharashtra_lonar%20wls.pdf	partly

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
Re-vegetation	Partially implemented
Habitat manipulation/enhancement	Partially implemented
Catchment management initiatives/controls	Partially implemented

Species

Measures	Status
Threatened/rare species management programmes	Partially implemented

Human Activities

Measures	Status
Regulation/management of wastes	Partially implemented
Management of water abstraction/takes	Partially implemented
Communication, education, and participation and awareness activities	Partially implemented
Research	Proposed

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? Yes, there is a plan

Further information

Restoration Plan is same as Management plan.

5.2.7 - Monitoring implemented or proposed

Monitoring	Status
Water quality	Implemented
Birds	Implemented

6 - Additional material

6.1 - Additional reports and documents

6.1.1 - Bibliographical references

Badve, R.M., Kumaran, K.P.N and Rajshekhar, C. (1993). Eutrophication of Lonar lake, Maharashtra. *Current Science*, Vol 65 No 4, pp. 347-351.

Borul, S.B. (2012). Study of water quality of Lonar Lake. *Journal of Chemical and Pharmaceutical Research*, Vol.4, No. 3, pp. 1716-1718.

Central Ground Water Board (2007). *Groundwater Information Buldhana District, Maharashtra*. Ministry of Water Resource, Government of India, pp. 25

Channabasavaraj. W (2015). Understanding the Engineering Behaviour of Soil from an impact Crater, India, *International Journal of New Technology and Research (IJNTR)* Vol. 1, Issue 3, pp. 35-41.

Limnological Study on Lonar lake: A Unique Brackish Crater Lake in India, Shanta Satyanarayan, P.R. Chaudhari and Sharda Dhadse.

Dabhade D.S. (2013) Eutrophication, A threat to Saline Lake in a Crater at Lonar, Maharashtra, *Asian Journal of Contemporary Sciences*, Vol 2, No.1, pp. 1-6

Ghanekar,P.K. (1996). *Vigyanatil Chamatkar Lonar*, Snehal Prakashan, Pune.

Invasive Alien Species of India (2017).

Kanekar, P.P., Joshi, A.A., Kelkar,A.S., Borgave and S.S.,Sarnaik,S.S (2008). Alkaline Lonar lake, India-a treasure of alkaliphilic and halophilic bacteria. In: *Proceedings of Taal2007: The 12th World Lake Conference*, Vol.12, pp. 1765-1774.

Mahabal, A (2008). An Overview. *Fauna of Lonar Wildlife Sanctuary*, Zoological Survey of India, Conservation Area Series, 37, pp. 1-15

Migratory and Wetland Birds relevant to Ramsar Convention in India (2017).

Rodgers, W.A. and H.S. Panwar (1998). *Planning a Wildlife Protected Area Network in India*. Vol 1 and 2. A report prepared for the Department of Environment, Forests and Wildlife, Government of India at the Wildlife Institute of India, Dehradun.

Rodgers, W.A., H.S. Panwar and Vinod B. Mathur (2002). *Wildlife Protected Area Network in India: A review (Executive Summary)*, Wildlife Institute of India, Dehradun.

Siddiqi, S.Z(2008) Limnological Profile of High Impact Meteor Crater Lonar Lake, Buldhana, Maharashtra, India, an Extreme Hyperalkaline, Saline Habitat, In: *Proceedings of Tall2007: The 12th World Lake Conference*, Vol. 12, pp. 1597-1613.

Strategic Framework and Guidelines for the future development of the List of Wetlands of International Importance of the Convention on Wetlands (Ramsar, Iran, 1971)-2012 Revision (2012).

IUCN Red-list of Threatened Species in India (2017)

6.1.2 - Additional reports and documents

i. taxonomic lists of plant and animal species occurring in the site (see section 4.3)

<no file available>

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

<no file available>

6.1.3 - Photograph(s) of the Site

Please provide at least one photograph of the site:



Panoramic view of Lonar Lake (Maharashtra forest department, 13-05-2020)



A lone peacock at Lonar Lake (Maharashtra forest department, 13-05-2020)



Landscape of Lonar Lake (Dr. Sudhakar Kurhad, 10-11-2019)

6.1.4 - Designation letter and related data

RIS for Site no. 2441, Lonar Lake , India

Designation letter

<1 file(s) uploaded>

Date of Designation 2020-07-22