

Koshi Tappu Ramsar Site: Updates on Ramsar Information Sheet on Wetlands

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Abstract

*Major changes to the ecological character of the Ramsar site, including in the application of the Criteria, since the previous Ramsar Information Sheet (RIS) for the site are the degradation of forest quality due to the invasion of the exotic species especially *Mikania micrantha* since last few years, replacement of old grassland habitat by new ones due to the meandering of the Koshi River and alteration of plant species composition due to the vegetation changes. For example, few plant species have appeared in the Sisso-Acacia forest habitat. Decline in water birds population due to poisoning, siltation in the rivers/surrounding wetlands and over fishing has been noticed. Moreover eutrophication is prevalent in most stagnant waters especially oxbow lakes and seepage ponds. Over-exploitation in the natural resources has led to the degradation of the habitat quality and loss, hence the change in population of Wild Water Buffalo (*Bubalus arnee*), deer species (*Axis spp.*), Gharial (*Gavialis gangeticus*) and Gangetic Dolphin (*Platanista gangetica*). The current flood of Koshi River after the breakage of the eastern embankment is uncertain to predict the future of the lower part of the Koshi Tappu Ramsar site.*

Key Words: Ramsar information sheet (RIS), Alien spp, Koshi tappu wildlife reserve (KTWR), Ramsar convention.

Overview

Koshi Tappu Wildlife Reserve (KTWR) was mainly established with an aim to conserve the remaining population of the wild water buffalo. The aquatic and terrestrial habitats occupies 12.9% and 87.1 % of total available habitat of the Reserve respectively (WMI/IUCN Nepal, 1994). Terrestrial habitats include 67.7% grassland, 2.6% savannah and 4.2% forest land (based on Aerial photos of 1991/1992). The vegetation of the reserve is mainly characterised by mixed deciduous riverine forest, *Dalbergia sissoo/Acacia catechu*, grasslands and marshy vegetation. The eastern part of the Koshi vegetation is further classified into four major types: woody vegetation, tall grassland, dry grassland and woody mixed (Dahal and McGowan 2005). In total, 514 plant species are reported, of which 502 belongs to Angiosperm and 12 belongs to Gymnosperm (Sah, 1997).

The reserve is by far the most important wetland staging post for migrating waders and water birds in Nepal (Inskipp and Inskipp 1991) and one of the most important in Asia (Scott 1989).

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A high total of 486 bird species, including residents and migrants has been listed representing 61 bird families of the world (BCN press release 2008). Among them more than 70 species are wetland dependent and most of these birds are regular and passage migrants and over 8 species are globally threatened. Notable birds recorded in the site include *Gallicrex cinerea*, *Caprimulgus asiaticus*, *Bubo coromandus*, *Coracina melanoptera*, *Saxicola leucura* and *Megalurus palustris*. The Koshi Barrage, situated south of Koshi Tappu but lies within the buffer zone, is the most important wetland for water birds in Nepal.

Apart from the bird diversity, Koshi Tappu is the host of about 31 species of mammals, 34 species of reptiles, 117 species of fishes, 77 species of butterflies, 11 species of amphibian and 21 species of insects (Bhandari, 1998). Furthermore it is the home to threatened species Gangetic Dolphin (Shrestha 1993), two species of crocodiles, the Marsh Mugger *Crocodilus palustris* and Gharial (Scott 1989).

Physical Features

Koshi Tappu is a 16.3 Km long section of the Saptakoshi River and its floodplain and the lowest southern boundary is about 9.3 km upstream of the Koshi Barrage. This dam was constructed to hold water during monsoonal floods which has been broken down by flood very recently (3rd week of August 2008). The river is very wide and shallow. The water flow fluctuates and the water depth is variable up to 5 m. The soil is sandy to silty loam. The climate is subtropical.

General Ecological Features

The major vegetation assemblages are *Acacia catechu*-*Dalbergia sissoo* forest, *Dalbergia sissoo* forest, *Acacia catechu* Forest, Mixed deciduous riverine forest, Savanna, *Saccharum-phragmites* Grassland, *Saccharum-Typha* Grassland, *Saccharum Type* Grassland, *Imperata type* Grassland and *Cymbopogon Saccharum type* grassland.

The coverage of forest area is only about 6% compared to 68% of grasslands. The survival and distribution of forest stands is heavily influenced by the changing course of the Koshi River and the magnitude of the flood that washes the chunk of forest. In above mentioned 4 types of forest, *Sissoo*, predominates in most of the forest patches. Forest appears to be dense from outside but are actually thin. They are in immature state and their fate is uncertain. If not disturbed or washed away, they might stabilize. *Khair* forest is more prevalent towards north western part of the reserve in patches. Mixed forest is mostly confined to areas away from the river where the ground has been further developed from the fresh alluvium. Here *Bombax sp.* and *Acacia spp.* is mixed with species like *Callicarpa spp.* and such forest can also be seen along the embankment area. In central part of the reserve *Bombax spp.* trees are conspicuous and form small patches of forest.

Among the grassland, *Saccharum-Phragmites type* is common on river banks of the Saptakoshi river. In *Saccharum-Typha* association, *Typha spp.* is the usual colonizer in water bodies. Codominant associations of *Typha* with *Saccharum* indicates that this type of grassland has

originated in the dried water bodies. Saccharum type occurs near the running water bodies. Imperata type occurs on the drier sites and between forest patches. Grassland of the Cymbopogon- Saccharum type occurs in comparatively drier places.

Noteworthy Flora

List of dominant species includes Sissoo (*Dalbergia sissoo*), Khair (*Acacia catechu*), *Saccharum spontaneum*, *Phragmites karka*, *Typha angustifolia*, *Cymbopogon pendulus*, *Tamarix dioca*, *Digitaria adscendens*, *Fimbristylis squamosa*, *Persicaria lapathifolia*, *Echinochloa crusgalli*, *Echinochloa colona*, *Echhornia crassipes*, *Paspalum disticum*, *Cyperus compressus*, and *Alternanthera sensilis*.

Sissoo and Khair are the major species to recolonize after alluvial has changed further. Sissoo is the dominant among these two. Both of the species can grow in sandy, dry river beds. The grasslands are maintained by the annual flooding and grazing by wildlife.

Noteworthy Fauna

Wild Water Buffalo, Deer species, Gharial and Gangetic Dolphin and Globally Threatened Birds are main wildlife of the site (Table 1).

Ramsar Criteria and their justification

Six criteria, 1,2,3,5,6 and 9 have been used while updating the RIS. The criterias 5,6 and 9 were not identified and the explanation of the used criteria number 1 to 3 was missing in the RIS of 1995. Now current RIS prepared and sent to Ramsar Secretariat from the Department of National Parks and Wildlife Conservation (DNPWC) as administrative authority of the Ramsar Convention in Nepal provides explanation of all the above criteria. Each contracting parties to the Ramsar Convention has to submit the updated RIS minimum at every six years and this update was only sent after 13 years (from 1995 to July 2008).

Criterion 1: Koshi Tappu wetland is considered internationally important as it contains a representative, rare, or unique example of a natural or near-natural wetland type found within the appropriate biogeographic region.

Koshi Tappu is an unique example of natural free flowing Sapta Koshi River dammed about 8 Km downward to make bridge in the Eastern Nepalese Biogeographic Region in Tarai Physiographic division.

Criterion 2: Koshi Tappu wetland is considered internationally important as it supports vulnerable, endangered, or critically endangered species or threatened ecological communities.

Koshi Tappu wetlands support last remaining endangered population of wild water buffalo in Nepal. Besides this, Ganges River Dolphin, Gharial, 8 species of globally threatened wetland birds and as many as 23 species of globally threatened bird species are recorded here.

Criterion 3: Koshi Tappu wetland is considered internationally important as it supports populations of plant and/or animal species important for maintaining the biological diversity of a particular biogeographic region.

Koshi Tappu wetlands support endangered only wild population of Nepal's wild water buffalo, and the only Ganges river dolphin in Eastern Nepal Biogeographic region with at least 23 species of globally threatened bird species with 42 species of Anatidae family (wetland birds).

Criterion 5: Koshi Tappu wetland is considered internationally important as it regularly supports 20,000 or more water birds.

Koshi Tappu holds more than 20,725 water birds of 44-80 species (1994-1996 Asian waterfowl census), 16327 birds of 81 species (Singh 2001) that would exceed 20,000 when adding individuals of rest 400 species. The reserve supports largest heronry of Nepal with more than 25,000 nests counted in August 1996 (Choudhary 1996).

Criterion 6: Koshi Tappu wetland is considered internationally important as it regularly supports 1% of the individuals in a population of one species or subspecies of water bird.

Koshi Tappu supports more than 1% population of globally threatened Swamp Francolin *Francolinus gularis*, 100% population of the recently described subspecies Nepal Rufous-vented Prinia *Prinia burnesii nepalicola* (Baral et al. 2008).

Criterion 9: Koshi Tappu wetland is considered internationally important as it regularly supports 1% of the individuals in a population of one species or subspecies of wetland-dependent non-avian animal species.

Koshi Tappu holds about 150 individuals of Wild water buffalo in Nepal. The total estimated population of Bubalus arnee in Nepal and Assam, India is about 4,000. Thus the Nepal's wild buffalo is more than 1 % (3.75%) of the total global population.

Factors (past, present or potential) adversely affecting the site's ecological character, including changes in land (including water) use and development projects:

- ***Within the Ramsar site***

Overgrazing, over-fishing, and Siltation identified in RIS 1995 still continue in the site. The pressures were generalized as human disturbance but now has been listed as cross-breeding of Wild Water Buffalo with domestic buffalo, hunting and disturbance, illegal and heavy exploitation of timber, fuel wood and NTFPs, change in habitat ecology, khar-khadai and vandalism, invasive alien species, poisoning of wetland, dependency on fishing and conflict in issue of fishing license, blocking of migratory routes and loss of aquatic vegetation and birds.

- ***In the surrounding area***

The RIS 1995 identified grazing as pressure which still continues. The deforestation, fish and bird poisoning, trapping, hunting which was identified in 1995 has not been mentioned specifically in RIS 2008 but crop damage by wildlife, retaliatory and illegal killing of wildlife, inadequate forest and outside wetland area/reserve, invasion by alien species (Table 2), siltation and blocking of migratory routes, Koshi dam and flooding due to catchment degradation, loss of aquatic vegetation and birds, use of chemical fertilizers and pesticides, proposed Koshi high dam, Arun III hydro project and high tension line through the reserve has been added.

Conclusion

Nepal is preparing to participate in the 10th meeting of the contracting parties being held from October 28 to November 4, 2008 in Changwon city of Korea.

In this regard, a national report was already prepared and submitted to Ramsar Secretariat in 31st March 2008. As per the commitment of contracting party, DNPWC Nepal has updated the Ramsar Information Sheet of Koshi Tappu Ramsar Site. This update has identified some additional Ramsar criteria for this site (numbers 5, 6 and 9) and provided explanation of all the Ramsar criteria identified for Koshi Tappu. Degradation of habitat quality has been identified as one of the change in ecological character whereas the general reduction of the number of total individuals of birds including wetland species has been documented though the number of the species has been increased.

We are not sure the future status of the Ramsar site as the recent flood has broken the eastern embankment just below the reserve headquarter and more than half of the flood water has been diverted to the villages washing irrigated lands in Nepal and India.

(This paper is based on the RIS submitted by DNPWC to Ramsar Secretariat. The author was involved in the compilation of this sheet as working in the office of administrative authority, DNPWC. He is the daily contact point with the office of the Ramsar secretariat).

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Annex

Table 1: List of population abundance data as per threatened categories

Species	Status	Average no (year)	Max. No	Census Date (Month/Year)
<i>Bubalus arnee</i>	P		100	2005
<i>Platanista gangetica</i>	P		12	
<i>Elephus maximus</i>	P			
<i>Gavialis gangeticus</i>	P		<12?	
<i>Francolinus gularis</i>	VU, En		c. 200 35	2005 BCN survey unpublished
<i>Coturnix chinensis</i>	CR		2	8 March 2002
<i>Sarkidiornis melanotos</i>	CR		20	Feb 1997
<i>Houbaropsis bengalensis</i>	CR, EN		1	March 2004
<i>Sypheotides indica</i>	EN, CR		2 (1 male & 1 female)	Jan 2003 & April 2004
<i>Esacus recurvirostris</i>	CR		1	June 1995
			6	2004
			21	1995
<i>Cursorius coromandelicus</i>	EN		8	March 2004
<i>Rynchops albicollis</i>	VU, CR		6	Feb –March 1981 (Not seen 2000 onwards)
<i>Gelochelidon nilotica</i>	CR	Range: 2-14	7	April 1999
<i>Sterna caspia</i>	CR	Range: 1-15 (1993)	1	Feb 2000 (Not seen after 2000)
<i>Sterna aurantia</i>	CR	2-29 (1994)	4	March 2004
<i>Sterna acuticauda</i>	NT, CR	3-41 (1996)	4	March 2004
<i>Haliastur indus</i>	CR		4	April 1986
<i>Haliaeetus leucoryphus</i>	VU, EN	1-4 (1988)	2	Feb 2004
<i>Haliaeetus albicilla</i>	NT, EN	1-4 (1989)	2	Feb 2004
<i>Gyps bengalensis</i>	CR, CR	61 nests in 2001	No active nests, <30	2004
<i>Aquila rapax</i>	CR		1	2002
<i>Aquila heliaca</i>	VU, EN	1-3 (1993)	1	2004
<i>Falco chicquera</i>	CR		<5 pairs	2003
<i>Falco jugger</i>	NT, CR		1?	April 2001
<i>Botaurus stellaris</i>	CR		1?	1998
<i>Pelacanus philippensis</i>	NT, EN	12-120 (1996)	<12	2004
<i>Ephippiorhynchus asiaticus</i>	NT, CR	2-10 (1998)	<12	2004
<i>Saxicola insignis</i>	VU, En	1-10 (1982)	1	2000
<i>Megalurus palustris</i>	En	4-12 (2000)	<100	BCN 2005

Globally threatened and Nationally Threatened
 CR Critically Endangered
 EN Endangered

VU Vulnerable
 NT Globally Near-threatened
 P=GoN Protected

Table 2: List of Alien invasive species and environmental weeds

SN	Scientific Name	Risk status	Local name	Habit/habitat
1	<i>Ageratina adenophora</i>	High Risk Posed	Barmara	Herb/moist places
2	<i>Chromolaena odorata</i>	High Risk Posed	Barmara	Sub shrub/forest & fallow land
3	<i>Eichhornia crassipes</i>	High Risk Posed	Jal Kumbhi	Aquatic herb
4	<i>Ipomea carnea jacq. subsp. fistulosa</i>	High Risk Posed	Besaram	Shrub/moist places
5	<i>Lantana camara</i>	High Risk Posed	Barphada, vanphanda kanda	Shrub/forest & waste places
6	<i>Mikania micrantha</i>	High Risk Posed	Lahare Barmara	Herbaceous climber/moist forest thickets
7	<i>Alternanthera Philoxeroides</i>	Medium Risk Posed		Herb/wet places
8	<i>Parthenium hysterophorus</i>	Medium Risk Posed		Herb/Waste places
9	<i>Ageratum conyzoides</i>	Medium Risk Posed	Ganaune jhar, Boke jhar	Herb/moist places
10	<i>Amaranthus spinosus</i>	Medium Risk Posed	Kadelunde	Herb/moist waste & cultivated fields
11	<i>Argemone mexicana</i>	Medium Risk Posed	Satyanashi, thakal	Herb/roadside and wet places
12	<i>Cassia tora</i>	Medium Risk Posed	Tapre, Chakmake	Herb/shrub waste places
13	<i>Hyptis suaveolens</i>	Medium Risk Posed		Herb/forest floor
14	<i>Leersia hexandra</i>	Medium Risk Posed		Herb/wet places
15	<i>Pistia stratiotes</i>	Medium Risk Posed	Kumbhika	Aquatic herb
16	<i>Bidens pilosa</i>	Low Risk posed	Kalo kurro	Herb/road side, waste places
17	<i>Cassia occidentalis</i>	Low Risk posed	Kasandi	Shrub/waste lands
18	<i>Mimosa pudica</i>	Low Risk posed	Lajjawati	Shrub/moist places
19	<i>Oxalis latifolia</i>	Low Risk posed	Chariamilo	Herb/open fields
20	<i>Xanthium strumarium</i>	Low Risk posed		Herb/cultivated and fallow land