Information Sheet on Ramsar Wetlands (RIS) – 2006-2008 version

Available for download from http://www.ramsar.org/ris/key_ris_index.htm.

Categories approved by Recommendation 4.7 (1990), as amended by Resolution VIII.13 of the 8th Conference of the Contracting Parties (2002) and Resolutions IX.1 Annex B, IX.6, IX.21 and IX. 22 of the 9th Conference of the Contracting Parties (2005).

Notes for compilers:

1. The RIS should be completed in accordance with the attached *Explanatory Notes and Guidelines for completing the Information Sheet on Ramsar Wetlands*. Compilers are strongly advised to read this guidance before filling in the RIS.

2. Further information and guidance in support of Ramsar site designations are provided in the *Strategic Framework and guidelines for the future development of the List of Wetlands of International Importance* (Ramsar Wise Use Handbook 7, 2nd edition, as amended by COP9 Resolution IX.1 Annex B). A 3rd edition of the Handbook, incorporating these amendments, is in preparation and will be available in 2006.

3. Once completed, the RIS (and accompanying map(s)) should be submitted to the Ramsar Secretariat. Compilers should provide an electronic (MS Word) copy of the RIS and, where possible, digital copies of all maps.

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1. Name and address of the compiler of this form:

FOR OFFICE USE ONLY.

DD MM YY

Designation date Site Reference Number

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2. Date this sheet was completed/updated:

18 April 2006

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3. Country:
Nepal

4. Name of the Ramsar site:
The precise name of the designated site in one of the three official languages (English, French or Spanish) of the Convention. Alternative names, including in local language(s), should be given in parentheses after the precise name.
Gokyo and Associated Lakes

5. Designation of new Ramsar site or update of existing site:

This RIS is for (tick one box only)**:**
a) Designation of a new Ramsar site √❑; or
b) Updated information on an existing Ramsar site ❑

6. For RIS updates only, changes to the site since its designation or earlier update:
a) Site boundary and area

The Ramsar site boundary and site area are unchanged: ❑
or
If the site boundary has changed:
i) the boundary has been delineated more accurately ❑; or
ii) the boundary has been extended ❑; or
iii) the boundary has been restricted** ❑
and/or
If the site area has changed:
i) the area has been measured more accurately ❑; or
ii) the area has been extended ❑; or
iii) the area has been reduced** ❑

** **Important note**: If the boundary and/or area of the designated site is being restricted/reduced, the Contracting Party should have followed the procedures established by the Conference of the Parties in the Annex to COP9 Resolution IX.6 and provided a report in line with paragraph 28 of that Annex, prior to the submission of an updated RIS.

b) Describe briefly any major changes to the ecological character of the Ramsar site, including in the application of the Criteria, since the previous RIS for the site:

7. Map of site:
Refer to Annex III of the *Explanatory Note and Guidelines*, for detailed guidance on provision of suitable maps, including digital maps.

a) A map of the site, with clearly delineated boundaries, is included as:
i**) a hard copy** (required for inclusion of site in the Ramsar List): √❑;

ii**) an electronic format** (e.g. a JPEG or ArcView image) √❑;
iii) **a GIS file providing geo-referenced site boundary vectors and attribute tables** √ ❑.

b) Describe briefly the type of boundary delineation applied:
e.g. the boundary is the same as an existing protected area (nature reserve, national park, etc.), or follows a catchment boundary, or follows a geopolitical boundary such as a local government jurisdiction, follows physical boundaries such as roads, follows the shoreline of a water body, etc.

Mainly follows a catchment boundary

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8. Geographical coordinates (latitude/longitude, in degrees and minutes):
Provide the coordinates of the approximate centre of the site and/or the limits of the site. If the site is composed of more than one separate area, provide coordinates for each of these areas.

27 ^{0} 57.02' (Latitude), 80 ^{0} 41.58'(Longitude)

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9. General location:
Include in which part of the country and which large administrative region(s) the site lies and the location of the nearest large town.

It lies in the Eastern development region in Sagarmatha Zone. The Administrative district is Solukhumbu. The district headquarter is Salleri and it takes two days to reach the park headquarter Namche from Salleri. Namche is the nearest town from where it takes two days walk to reach Gokyo. Other nearest village, Kumjung, where the Village Development Office, Buffer zone User committee Office, hospital and secondary school are available is only an hour less compared to Namche. The nearest village with permanent settlement is Dole and it takes one day's walk from Gokyo. The human population of Namche VDC is 1,386 (288 HH), and Khumjung VDC is 1,738 (396 HH).
Gokyo lies in the ward number 2 of the Khumjung Village Development Committee of Solukhumbu district.

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10. Elevation: (in metres: average and/or maximum & minimum)
Gokyo Average 4,734 m (Longbanga Cho 4,710m- Ngojumba Cho 4,950m)

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11. Area: (in hectares)

7,770 hectares for the Gokyo and associated lakes with 196.2 ha as water bodies covered by 19 lakes among which following five are important.

Main lakes around Gokyo wetland in Sagarmatha National Park

Lake Name	Associated Wetland No	Latitude	Longitude	Area (ha)	Mean Length (m)	Elevation (m)
Thonak Cho	4	27°58.49'	86°40.99'	65.07	1925	4834
Gokyo (Dudhpokhari) Cho	3	27°57.02'	86°41.58'	42.69	975	4734
	5	27°56’	86°42’	29.00		
Taujung Cho	0	27°56.43'	86°42.11'	16.95	700	4728
Ngozumba Cho	2	28° 0.31'	86°41.09'	14.39	585	4950
Longbanga Cho	0	27°55.8’	86°42.36’			4710
Total 6	14			**168.11***		

* This does not include the area of Longabanga lake (Sources: Mool et al 2002 and field survey August 2005)

12. General overview of the site:

Provide a short paragraph giving a summary description of the principal ecological characteristics and importance of the wetland.

The site encompasses glacial lake of significant sizes and number in distinct central Himalayan geographical location. The wetland is the centre of endemism in the eastern Himalayan region and lies among the 200 eco-regions as eastern Himalayan eco-region.

13. Ramsar Criteria:

Tick the box under each Criterion applied to the designation of the Ramsar site. See Annex II of the *Explanatory Notes and Guidelines* for the Criteria and guidelines for their application (adopted by Resolution VII.11). All Criteria which apply should be ticked.

(1)• (2)• 3• (4)• 5• 6• 7 8 • 9

❑√ ❑√ √❑ √❑ ❑ ❑ ❑ ❑ ❑

14. Justification for the application of each Criterion listed in 13 above:

Provide justification for each Criterion in turn, clearly identifying to which Criterion the justification applies (see Annex II for guidance on acceptable forms of justification).

Criteria 1: A wetland should be considered internationally important if it contains a representative, rare, or unique example of a natural or near-natural wetland type found within the appropriate biogeographic region

Gokyo lake system is a unique and rare example of natural wetland type in the high Himalayan biogeographic region. It is one of the highest lakes in the world, lies in the Khumu region, the central Himalayas, between 4,710- 4,950 m altitude. The Khumbu region encompasses the Sagarmatha National Park, the highest national park in the world where four of the world's seven highest mountains are located such as Mount Everest (8,848m), Lhotse (8,510m), Lhotse Shar (8,383m) and Cho Oyo (8,189m). The lake is located at the base of Cho Oyo (the seventh world's highest mountain) and head of the Dudh Koshi River (Milk River), the River is one of the major tributaries of the largest Saptakoshi River in Nepal and mighty Ganges River of India. It feeds from the world's largest glacier- Ngozumpa glacier.

Criteria 2: A wetland should be considered internationally important if it supports vulnerable, endangered, or critically endangered species or threatened ecological communities

The wetland harbors a small population of several rare and vulnerable flora and fauna species.
The below table provides information on protected species under IUCN Redlist, Government of Nepal and CITES.

S.No	Scientific name	Vernacular name	IUCN Red List	Government of Nepal	CITES
Plants					
1.	*Neopicrorhiza scrophulariifolia*	Kutki	Vu		
Mammals					
2	*Uncia uncia*	Snow leopard	EN	Protected	I
3	*Muschus chrysogaster,*	Musk deer	LR\nt	Protected	
4	*Hemitragus jemlahicus*)	Himalayan thar	VU		

List of threatened birds of Gokyo and Associated lakes

SN/Order/family	**Common name**	***Scientific name***	***CMS (2004)***	***IUCN Red list (2007)***
ANSERIFORMES				
Anatidae				
1	Northern Pintail	*Anas acuta*	*II*	
	Gadwal	*Anas strepera*	*II*	*LC*
	Common Pochard	*Aytha ferina*	*II*	
2	Northern Shovler	*Anas Clypeata*	*II*	*LC*
3	Common Teal	*Anas crecca*	*II*	*LC*
4	Ferruginous Pochard	*Aythya nyroca*	*I/II*	*NT*
5	Tufted Duck	*Aythya fuligula*	*II*	*LC*
6	Common Golden Eye	*Bucephala clangula*	*II*	*LC*
7	Brahmini ducks	*Tadorna ferruginea*	*II*	
GRUIFORMES				

Gruidae				
8	Demoiselle Crane	Grus vigro	*II*	*LC*
CICONIIFORMES				
Scolopacidae				
9	Common Redshank	*Tringa totanus*	*II*	*LC*
10	Wood Snipe	*Gallinago nemoricola**		*VU*
11	Common Greenshank	*Tringa nebularia*	*II*	*LC*
12	Green Sandpiper	*Tringa ochropus*	*II*	*LC*
13	Common Sandpiper	*Actitis hypoleucos*	*II*	*LC*
14	Temminck's Stint	*Calidris temminckii*	*II*	*LC*
Laridae				
15	CommonTern	*Sterna hirundo*	*II*	*LC*

(Source: Dr.Hem Sagar Baral, BCN July 2005 email communication and Field survey July 2005)

- globally threatened, rare-5% chance to see in Sagarmatha NP

Criteria 3: A wetland should be considered internationally important if it supports populations of plant and/or animal species important for maintaining the biological diversity of a particular biogeographic region

The wet alpine pasture, moraines and damp river/stream banks along the lake area including Dudh koshi River catchments are the natural habitats for many endemic species of plants such as Ghans (*Kobresia fissiglumis*), Ghans (Kobressia *gandakiensis*), *Pedicularis poluninii*, *Pedicularis. pseudoregelina*, etc (Vernacular name not available.)

The site harbors the endemic fish Torrent stone carp (*Psilorhynchus homaloptera*), reported from the Dudhkoshi region at an altitude of 2,950 m (PCP/DNPWC 1995).

Criteria 4: **A wetland should be considered internationally important if it supports plant and/or animal species at a critical stage in their life cycles, or provides refuge during adverse conditions.**

At least 6 pairs of Brahmini ducks (*Tadorna ferruginea)*, which are local,summer visitor, passage migrant, less than 5 records at Sagarmatha,. It is the breeding site for these ducks in this High Himalayan bio-geographic zone. It also provides staging points for the following species: Eurasian Wigeon (*Anas penelope*)-passage migrant, less than 5 records at Sagarmatha,; Northern Pintail (*Anas acuta*)-passage migrant, rare-5% chance; Common Pochard (*Aytha ferina*)- passage migrant, rare-5% chance, Common Coot (*Fulica atra*)- passage migrant, rare-5% chance; Eurasian Woodcock (*Scolopax rusticola*)-Summer visitor, less than 5 records at Sagarmatha,; and Great Crested Grebe (*Podiceps cristatus*) passage migrant, rare-5% chance.

15. Biogeography (required when Criteria 1 and/or 3 and /or certain applications of Criterion 2 are applied to the designation):

Name the relevant biogeographic region that includes the Ramsar site, and identify the biogeographic regionalisation system that has been applied.

a) Biogeographic region:
Eastern Himalayan Alpine Meadows (112)
b) biogeographic regionalisation scheme (include reference citation):
WWF Global 200 Ecoregions

16. Physical features of the site:
Describe, as appropriate, the geology, geomorphology; origins - natural or artificial; hydrology; soil type; water quality; water depth, water permanence; fluctuations in water level; tidal variations; downstream area; general climate, etc.

Gokyo wetlands area lies in Higher Himalayan Zone at an altitude of 4,734 m. Physiographically this zone has steeply to very steeply sloping mountains terrain. Geographically this zone is colluevial and morinal deposited surface, composed of various kinds of gneisses that forms the basement of the Tibetan-Tethys-Sedimentary sequence and consists of high grade metamorphic rocks which include various kinds of genisses, schists and migmatites. Although traditionally these rock units were thought to be very old rocks of the Indian shield forming the basement for the Tethyan as well as lesser Himalayan rocks, recent studies have shown that they are much younger rocks of the Neoproterozoic age, about 800 to 500 million years old. Geologically the Himalayas is recent in origin and its geographical relative isolation from Tibet and rest of the Nepal, the area has developed unique floral and faunal assemblages with high diversity, endemism and number of rare and vulnerable species

It is natural in origin as glacial lakes and adjacent Nogjumba glacier partly feeds to the wetland series. The upper two lakes (Nogjumba and uppermost unnamed lake) are tips of the glaciers whereas the rest Thonak, Gokyo, Taujun and Longabanga are also fed by the glaciers of the western side. The rate of retreat of Nogjumba glacier and eroding eastern ridge of these lakes shows that every year the distance between the lakes and glacier is reducing. The future of the 8 hotels and the lakes are not sure and requires strong monitoring to predict the trend. As per the Kanchi Phuti Sherpa of Gokyo Lodge, glacier has moved about 10 m west towards Gokyo in last 25 years.
Clay sandy soil mixed with humus at some points where the area has grazing land around.
The down stream of the Gokyo and Associated Lake is basically National Park area till the Jorsalle/Monju village along the Bhote Koshi, Imja Khola. The River after Jorsalle till south of Lukla is Buffer zone area of the Sagarmatha National Park. The River stretch between the Nogjumba-Gokyo confluence (the meeting point of Nogjumba glacier and Gokyo lake series) to Larja confluence (the meeting point of Bhote koshi and Imja River) is used mainly to domestic purpose. Few local water mills are operated at the Phortse River area near Phortse Thanga for grinding local crop products (floor of corn, buckwheat and millet). The water from the Gokyo Wetlands to Larja confluence is used for drinking purposes to livestock.
Thus the clean, unpolluted and regular supply of water down stream from Gokyo and associated lakes-Najumba glaciers is important not only for the local people but also to the down stream users including Chaurikharka Village Development Committee.
The winter is long with pronounced cold from October to March with light summer and mild rain from June to October. The other months are cold and clear.

The pH is low; turbidity is slightly high in case of Gokyo Lake to high in Thonak Lake for drinking water purpose as per WHO guideline. The bacteriological test is negative for Gokyo but has contamination of Coliforms in Thonak Lake (Annex 1).
During the rainy season the level of water increases whereas it decreases during the winter. The melt of ice after winter increases the volume of water.
The level of water is high in rain and after the melting of ice. The water quantity is low during the winter when ice is frozen.
The general climate is pronounced winter with about minus 0-20°C. Lakes are frozen for about 3-4 months and melts slowly by the end of February/March. The summer is warmer with mild rain from June to September. The rest of the months are mild cold and are optimum for tourism activities.

17. Physical features of the catchment area:

Describe the surface area, general geology and geomorphological features, general soil types, and climate (including climate type).

Gokyo wetlands area lies in Higher Himalayan Zone, ranges above 4,700 m. Physiographically this zone has steeply to very steeply sloping mountains terrain. Geographically this zone is colluevial and morinal deposited surface, composed of various kinds of gneisses that forms the basement of the Tibetan-Tethys-Sedimentary sequence and consists of high grade metamorphic rocks which include various kinds of genisses, schists and magmatites.

It is mainly grassland, rocks and glacier.
The general climate is cold with pronounced winter with about minus 0-20°C temperature. Lakes are frozen for about 3-4 months and melts slowly by the end of February/March. The summer is warmer with mild rain from June to September. The rest of the months are mild cold and are optimum for tourism activities.

18. Hydrological values:

Describe the functions and values of the wetland in groundwater recharge, flood control, sediment trapping, shoreline stabilization, etc.

As the catchment of the lake is among the sources of Dudh Koshi River, the wetland forms the regular source of water. The sediments arriving at the lake from the glacier melt water is deposited in the base of the lake. The Thonak lake area seems have been reduced from the past and one of the reasons for this may be due to the deposition of stone particles and sediments. Wetlands are fed by glacier and rain water.

19. Wetland Types

a) Presence:

Circle or underline the applicable codes for the wetland types of the Ramsar "Classification System for Wetland Type" present in the Ramsar site. Descriptions of each wetland type code are provided in Annex I of the *Explanatory Notes & Guidelines*.

Marine/coastal: A • B • C • D • E • F • G • H • I • J • K • Zk(a)

Inland: L • (M) • N • (O) • P • Q • R • Sp • Ss • (Tp) • Ts • (U) • (Va) • Vt • W • Xf • Xp • Y • Zg • Zk(b)

Human-made: 1 • 2 • 3 • 4 • 5 • 6 • 7 • 8 • 9 • Zk(c)

b) Dominance:

List the wetland types identified in a) above in order of their dominance (by area) in the Ramsar site, starting with the wetland type with the largest area.
Tp,O, M,Va,U

20. General ecological features:

Provide further description, as appropriate, of the main habitats, vegetation types, plant and animal communities present in the Ramsar site, and the ecosystem services of the site and the benefits derived from them.

Vegetation

The bioclimate of this zone is axeric with mean temperature of the coldest and hottest month at January and July ranging from – 9 to –12 °C and –3 to 3°C respectively and the frosts period last 8 to 10 months. This zone represents a treeless region with some dwarf scrubs of *Rhododendron* and *Potentilla* Sp. interspersed by rocky slopes and alpine pasture. The vegetation is dominated by Alpine pasture meadow with common species Him Chimal (*Rhododendron nivale*), Sunpate (*Rhododendron anthopogon*), Bhale Sunpate (*Rhododendron lepidotum*), Bhairang pate (*Potentilla fruticosa*), Somlata (*Ephreda geradiana*), Phursan (*Cassiope fastigiata*), Bhui Chuk (*Hippophae tibetiana*), Orima (*Myricaria rosea*), *Carex* spp., *Kobresia* spp., *Poa* spp., *Festuca* spp., with a number of colorful herbs belonging to family Rosaceae, Primulaceae, Ranunculacea, Gentianaceae, Polygonaceae, Campanulaceae, Papaveracea, Crassulaceae, Scrophulariaceae and so on.

Plant Diversity

The deep portion of lake lacks aquatic macro vegetation, the micro vegetation is also very limited, some lichen and moss encrusted over the stones lying along the water. The marginal and shallow portions of lakes, marshes and streams sides are rich in vegetation. The vegetation of Taujun cho lake is similar to Gokyo lake as located in nearby area Whereas, the vegetation in Thonak Cho Lake is scarce due to more rocky surroundings and the marginal vegetation is also very limited, only some species of Juncus *sp., Carex sp., Oxyria digyna*, *Kapase Phul (Saussurea gossipiphora*), Gogan (*Saussurea nepalensis*), *Lagotis kunawurensi*, *Stellaria decumbens*, *Saxsifraga andersonii*, *have* been recorded from the stony margins of lake. Common species occurred along the steeply slopes are Somlata (*Epherdra* geradiana), *Rhododendron lepidotum*, *Rhododendron anthopogon*, *Potentilla fruticosa*, *Pedicularis trichoglossa*, *Pedicularis scullyana*, *Ranunculus pulchellus*, *Cyananthus incanus*, *Rhoidola himalensis*, etc. The vegetation of Nojumba Cho is very similar.

21. Noteworthy flora:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 14, Justification for the application of the Criteria) indicating, e.g., which species/communities are unique, rare, endangered or biogeographically important, etc. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

Over 80 flowering plant species were collected and the common species occurred along the Gokyo lake are: *Him Chimal (Rhododendron nivale*), *Sunpate (Rhododendron anthopogon*), *Rhododendron lepidotum*, *Potentilla fruticosa*, *Waldheimia glabra*, *Lagotis kunawurensis*,), *Lactuca lessertiana*, *Cremanthodium reniformae*, Sharmaguru *(Swertia multicaulis*), Medosero (*Primula sikkimensis*), *Primula wollastonii*, *Primula caveana*, Sung (*Pedicularis longiflora*), *Pedicularis trichoglossa*, *Pedicularis roylei*, *Pedicularis elwesii*, *Pedicularis scullyana*, *Anaphalis* spp., *Erigeron multiradiatus*, *Suryamukhi (Cremanthodium nepalense)*, *Gentiana algida*, *Ranuculus pulchllus*, *Cyananthus incanus*, *Bistortia* spp., *Meconopsis horridula*, *Poa* spp., *Juncus* spp., *Kobresia* spp., *Festuca* spp., etc.

Besides, a small population of important plant species, Sharmaguru (*Swertia multicaulis*), Kapase Phul, Costus (*Saussurea gossipiphora*), Kyashar (*Meconopsis horridula*), etc*.,* are also occurred in this area.

22. Noteworthy fauna:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 12. Justification for the application of the Criteria) indicating, e.g., which species/communities are unique, rare, endangered or biogeographically important, etc., including count data. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

The common wildlife species recorded was Pika (*Ochotona* sp.) The rangeland habitat provides habitats to carnivores such as beach marten (*Martes foina*) and red fox (*Vulpes vulpes*).

Himalayan tahr (*Hemitragus jemlahicus*)is prey base of Ssnow leopard (*Uncia uncia*)inhabiting lower part of the catchment and is common in the region. Pika, resident of the catchment is common in the area, is a prey base for carnivore including snow leopard.

The birds found in this site are Eurasian Woodcock(*Scolopax rusticola*), Great Crested Grebe (*Podiceps cristatus*) etc.

23. Social and cultural values:

a) Describe if the site has any general social and/or cultural values e.g., fisheries production, forestry, religious importance, archaeological sites, social relations with the wetland, etc. Distinguish between historical/archaeological/religious significance and current socio-economic values:

The person of Namche celebrates Janai purnima festival in Gokyo. The snake god is celebrated by all the devotees any time they visit there. The hotel persons use water sources above the Gokyo Lake that comes to the lake most probably from the Nogjumba glacier. The local hotel people and tourist and their group members are dependant on the lake water for bathing and washing their clothes. Sand is collected from the western corner of the Gokyo Lake where the glacier eroded sandy materials are deposited. Seasonal grazing is done by one of the hotel owner and few other local people. The Yak-Nak is used for carrying the logistics of the tourist and hotels are also grazed in the catchment.

The wetland is source of ecotourism, religious and Sherpa cultural assemblage in addition to the endemic plant diversity and source of fresh water for down stream.

b) Is the site considered of international importance for holding, in addition to relevant ecological values, examples of significant cultural values, whether material or non-material, linked to its origin, conservation and/or ecological functioning?

If Yes, tick the box ❑ and describe this importance under one or more of the following categories:

i) sites which provide 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) sites which have exceptional cultural traditions or records of former civilizations that have influenced the ecological character of the wetland:

iii) sites where the ecological character of the wetland depends on the interaction with local communities or indigenous peoples:

iv) sites where 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:

24. Land tenure/ownership:

a) within the Ramsar site:

The land is owned by the Government and the local authority is Sagaramtha National Park. Limited private land is owned by the people of the eight hotels.

The area is under the Government's ownership as Sagarmatha National Park. The Ministry of Forest and Soil Conservation, Government of Nepal is the legal authority. The park is governed by the National Parks and Wildlife Conservation Act 2029 BS (1973) and Himali Rastriya Nikunja Niyamawali 2036 B.S (Mountain National Parks Regulation 1979).

b) in the surrounding area:

The catchment is completely owned by the Government.

25. Current land (including water) use:

a) within the Ramsar site:

It's mainly a seasonal grazing land by the local people and mostly a rangeland with herb and shrub. Most of the area is rocky between these wetlands. The 8 hotels and their camping sites are used for providing lodge and camping facilities. One cattle shed is there owned by one of the hotel owner.

b) in the surroundings/catchment:

The rangeland is dominated by rock, glacier and grasses. It is used mainly for grazing. Grazing as traditional right is allowed to the local people of the National Park area. The definition of the local people embodies the people living within the Sagarmatha National Park.

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

a) within the Ramsar site:
Tourism pressure, pollution, overgrazing, deforestation, biodiversity loss, and encroachment are main threats to the site. Tourist stays there during the peak September-October season where about 2 weeks period, it is crowded and difficult to get camping and hotel facilities. Garbage produced by the tourists and their supporting team provides difficulties to dispose them properly. The area is grazed heavily as the livestock has to keep there to use them for the transport logistics of the tourists and the hotels. It is observed that some local hotel owner of Gokyo extended their boundary up to margin of Gokyo Lake by erecting stone walls. Traditionally pilgrimages used to encircle around the lake during the Janaipurnia festival but due to stone wall they are facing the problems. It is said that some communal religious site was also encroached by one hotel owner. The extension of the boundary wall towards the margin needs to be verified with the park area. Yaks and Yak hybrids heavily graze the vegetation as result of which the palatable grasses are reduced and growths of unpalatable and toxic plants are promoted.

b) in the surrounding area:
Tourism: Gokyo is one of the major tourists' destinations in Sagarmatha National Park, and series of environmental and socio-economic problems have also been identified.
Increased human activities created different environmental problems such as pollution, overgrazing and deforestation or biodiversity loss, encroachment, etc.
Pollution: The main sources of pollution are human waste and domestic sewages. Gokyo area has eight lodges/hotels on the northern side of the Gokyo lake, which annually crater over 7,000 tourists (Surendra Binod Sharma, Gokyo Resort, per. comm.). Most of the hotels have no safety tanks at toilets and discharge its outlet on the lake. Further more due to lack of water supply system washing, cleaning and sometimes bathing etc. have been taken at the lake. On the occasion of Janaiprunia festival about 500 people have been taken holy bath. At tourist season (April-May and October-December), sometimes camps are haphazardly erected along nearby places of lake contribute to add the pollution in lake due to their abandoning items.
Overgrazing: Traditionally for agricultural and transportation people reared the domestic cattle. About 100 cattle (yaks, horses, etc.) graze about eight months along the pastureland of Gokyo Lake, resulting decreased palatable species such as legume and increased unpalatable or toxic species, also disturb the natural succession process. The grazing pressures with trampling deplete the native species and increase soil erosion.
Deforestation/ unsustainable cleaning of biodiversity: During mountaineering expedition a large number of porters are used. Usually the trekking company does not manage the Kerosene oil and tents for the porters. The porters cut the large number of live alpine scrubs (Juniper, Rhododendron, etc.) for cooking food and making the space warm in cold nights. Studies showed that the alpine scrubs are most slow growing plants, for example, Juniper takes sixty or more years to be matured up to the size of 35 cm above the ground (Bjonness, 1980). The local hoteliers/ households also cut the green alpine scrubs for cooking, heating and construction. Cattle dung is also used for heating and cooking. Sometimes, large numbers of scrubs are cleaned for making a bed to store the yak fodder for the winter.

27. Conservation measures taken:

a) List national and/or international category and legal status of protected areas, including boundary relationships with the Ramsar site:
In particular, if the site is partly or wholly a World Heritage Site and/or a UNESCO Biosphere Reserve, please give the names of the site under these designations.

Sagarmatha National Park is established in 1976 and declared in a World Heritage Site since 1979 (first National Park to be designated in Nepal) and the proposed Ramsar site is located in the Park

b) If appropriate, list the IUCN (1994) protected areas category/ies which apply to the site (tick the box or boxes as appropriate):

Ia ❑;Ib ❑; II √ ❑; III ❑; IV ❑; V ❑; VI ❑

c) Does an officially approved management plan exist; and is it being implemented?:

Approved Buffer Zone Management is being implemented.
Park Management plan including tourism component has been submitted to the Department of National Parks and Wildlife Conservation for approval.

d) Describe any other current management practices:

Sagarmatha Pollution Control Committee is involved in the control of pollution in the Sagarmatha National Park including the proposed Ramsar site.

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28. Conservation measures proposed but not yet implemented:

e.g. management plan in preparation; official proposal as a legally protected area, etc.
Formation of tourism management sub-committee is proposed to mitigate the sites problem and help implement the wetland and tourism management activities.

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29. Current scientific research and facilities:

e.g., details of current research projects, including biodiversity monitoring; existence of a field research station, etc.
The study is limited to some anecdotal alternative energy, tourism perspective and glacial monitoring. The observational information's gathered by tourists do not stays back to neither in Sagarmatha nor in Kathmandu. The seasonal hotels in the site can provide space and other logistic for research.
The pyramid research centre (Lobuche) lies in the eastern side of the Gokyo that takes about 2 days walk through Chola Cho pass or 3 days walk via Phortse village but its research component does not encompass this area for most of their research.
WWF Nepal Program is working with the Department of Hydrology and metrology to monitor the long term impact of climate change in the Nogjumba glacier.

30. Current communications, education and public awareness (CEPA) activities related to or benefiting the site:

e.g. visitors' centre, observation hides and nature trails, information booklets, facilities for school visits, etc.
The visitor information centre of Namche provides the information to visitors. Park brochure is provided free of cost while buying entry permits either in Kathmandu or at Jorsalle entry point. Cultural and mountaineering information centre of Namche also gives the detailed information. Recently natural herb with medicinal value and ethnobotanical value by Amchi (Sherpa traditional herbal practitioner) is being developed.

31. Current recreation and tourism:

State if the wetland is used for recreation/tourism; indicate type(s) and their frequency/intensity.
The Gokyo Lake is one of the favoured destinations of the tourist visiting Sagarmatha National Park. The main purpose is to see the Mount Everest and other mountain peaks. Some tourist with special interest such as flowers, glacial and cultural/tradition has been observed. The Park has received about 18,000 tourists in 1997/98 which has increased up to almost 26,000 in 2000/01 and started decreasing then (about 19,600 in 2001/02). At least 25% of the tourist visiting the Park visits Gokyo area.
The trekking route passes through the Gokyo and also goes towards Lobuche (east) and Thame (west).

32. Jurisdiction:

Include territorial, e.g. state/region, and functional/sectoral, e.g. Dept of Agriculture/Dept. of Environment, etc.
Territorial-State owned (Ministry of Forest and Soil Conservation). Functional-Department (Department of National Parks and Wildlife Conservation).

33. Management authority:

Provide the name and address of the local office(s) of the agency(ies) or organisation(s) directly responsible for managing the wetland. Wherever possible provide also the title and/or name of the person or persons in this office with responsibility for the wetland.
Chief Conservation Officer Mr. Tulsi Ram Sharma
Sagarmatha National Park, Namche,
Solukhumbu, Nepal
Phone #: 00977-(19)-626043
(Address for the DNPWC is also acceptable)

34. Bibliographical references:

Scientific/technical references only. If biogeographic regionalisation scheme applied (see 15 above), list full reference citation for the scheme.
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Please return to: **Ramsar Convention Secretariat, Rue Mauverney 28, CH-1196 Gland, Switzerland**

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Annex 1.Laboratory Analysis of the water of Gokyo and Thonak Lakes of Sagarmatha National Park.

Parameter	Unit	WHO GV	Result	
			Gokyo Lake	Thonak Lake
Physical				
Turbidity	NTU	5	5.8	13.6
Suspended Solids	Mg/l		2.5	7
Chemical				
pH		6.5-5.8	5-6	5.5
Total Alkalinity	Mg/l as $CaCo_3$	500	29.4	6.3
Chloride	Mg/l as $CaCo_3$	250	7.84	10.78
Orthophosphate	Mg/l as $CaCo_3$		<0.01	<0.03
Total nitrogen	Mg/l as $CaCo_3$		1.8	1.9
Acidity	Mg/l as $CaCo_3$		<2.0	<2.0
Biochemical				
BOD	Mg/l		1.27	
Biological				
Coliforms	MPN/100ml	Nil		3

Annex 2. List of other wetland birds recorded in the Gokyo wetlands area of Sagarmatha National Park

SN/Order/ family	Common name	*Scientific name*	*Status*
ANSERIFORMES			
Anatidae			
1	Bar-headed Goose	*Anser indicus*	*m5*
2	Gadwal	*Anas strepera*	*m4*
3	Northern Shoveler	*Anas Clypeata*	*m4*
4	Gargeny	*Anas querquedula*	*m4*
5	Common Teal	*Anas crecca*	*m4*
6	Ferruginous Pochard	*Aythya nyroca*	*m4*
7	Tufted Duck	*Aythya fuligula*	*m5*
8	Common Golden Eye	*Bucephala clangula*	*m4*
GRUIFORMES			
Gruidae			
9	Demoiselle Crane	Grus vigro	m4
CICONIIFORMES			
Scolopacidae			

10	Solitary Snipe	*Gallinago solitaria*	*m4*
11	Common Snipe	*Gallinago gallinago*	*m4*
12	Common Redshank	*Tringa totanus*	*m4*
13	Common Greenshank	*Tringa nebularia*	*m4*
14	Green Sandpiper	*Tringa ochropus*	*m4*
15	Common Sandpiper	*Actitis hypoleucos*	*m4*
16	Terek Sandpiper	*Xenus cinereus*	*V*
17	Temminck's Stint	*Calidris temminckii*	*m4*
Laridae			
18	Brown-headed Gull	*Larus brunnicephalus*	*m4*
19	Black-headed Gull	*Larus ridibundus*	*m4*
20	Common Tern	*Sterna hirundo*	*m4*
Charadriidae			
21	Ibisbill	*Ibidorhyncha struthersii*	*Isbr5*
PASSERIFORMES			
Cinclidae			
22	White-throated Dipper	*Cinclus cinclus*	*r?4*
23	Brown Dipper	*Cinclus pallasii*	*r2*

(Source: Dr. Hem Sagar Baral, BCN July 2005 email communication and Field survey July 2005)

1=common, >75% chance, 2=fairly common, >50% chance,3=occasional, >25% chance, 4=rare, 5% chance, 5=less than 5 records at Sagarmatha.

I=Locally distributed, r=resident, seen all the year round, s=summer visitor, w=winter visitor, m=passage miogrant, v=vagrant, br=breeding confirmed (Basnet 2004)