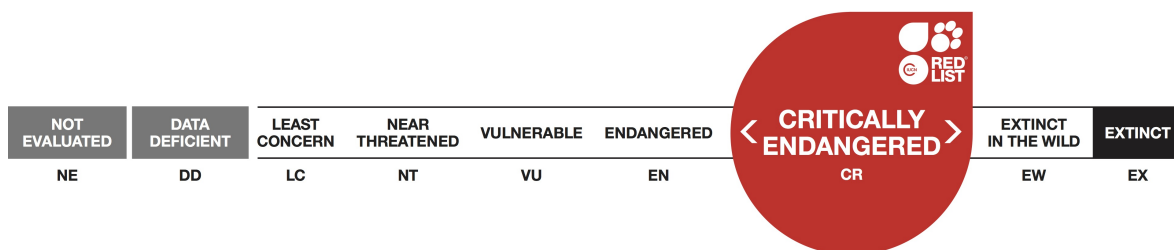


Gavialis gangeticus, Gharial

Assessment by: Choudhury, B.C. *et al.*



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Taxonomy

Kingdom	Phylum	Class	Order	Family
Animalia	Chordata	Reptilia	Crocodylia	Gavialidae

Taxon Name: *Gavialis gangeticus* (Gmelin in Linnaeus, 1789)

Synonym(s):

- *Lacerta gangetica* Gmelin in Linnaeus, 1789

Common Name(s):

- English: Gharial, Fish-eating Crocodile, Gavial, Indian Gavial, Indian Gharial, Long-nosed Crocodile
- French: Gavial du Gange
- Spanish: Gavial del Ganges

Assessment Information

Red List Category & Criteria: Critically Endangered A2bc; C1 [ver 3.1](#)

Year Published: 2007

Date Assessed: March 1, 2007

Justification:

Criterion A: Gharial qualify for Critically Endangered (CR) listing under criterion A2 ("reduction in population size based on an observed, estimated, inferred or suspected population size reduction of $\geq 80\%$ over the last 10 years or three generations, whichever is the longer, where the reduction or its causes may not have ceased OR may not be understood OR may not be reversible"), based on (b) an index of abundance appropriate to the taxon and (c) a decline in area of occupancy, extent of occurrence and/or quality of habitat). Very conservative estimates of population decline over a three-generation period (from 1946 to 2006) indicate there has been a 96 to 98% population decline (see details below), and the once widespread population has been reduced to a very small number of widely spaced subpopulations.

Criterion C: The Gharial also qualified for CR listing under criterion C1 - ("population size estimated to number fewer than 250 mature individuals and an estimated continuing decline of at least 25% within three years or one generation"). Estimates of adult population size indicate that there has been a decline from 436 adult gharials in 1997 to 182 in 2006. This represents a 58% drop across its range over a period of nine years, well within the span of one generation (see details below).

Rationale for Criterion A:

The generation length for the species is 20 years (the age at which 50% of total reproductive output is achieved) (Rao *et al.* 1995). The Red List Criteria require "declines measured over the longer of 10 years or 3 generations", in this case the population decline since 1946.

Early Records:

The early records for the gharial are mainly subjective and rarely quantitative. Old references indicate the gharial's abundance in the past: Common in the Indus River in Pakistan (Francis 1910, Rao 1933); Gandak River in Nepal (I.A.K. 1921); Jumuna River in Uttar Pradesh (Hornaday 1885), Kosi river in Bihar (Shortt 1921). Several authors mention seeing groups basking together and in 1885 Hornaday wrote that he could count 64 gharials in two hours on the banks of the Jamuna. Andrew Leith Adams (1867) wrote: "abounds in all the great rivers of Northern India...Ten or twenty may be frequently seen together". "Hundreds of Gharial were observed on the Narayani River (Nepal) prior to the construction of the Gandak barrage...in 1964 and in the early 1950s about 235 Gharial were counted along the Narayani river between Narayanghat and Tribeni" (Maskey 1999). With an estimated 11,000 river kilometers of habitat over a geographic area of over 20,000 square kilometers (much of the northern mass of the Indian subcontinent from the Indus river system in the West to the Irrawaddy in the East) the Gharial had a conservatively inferred population of 5,000 to 10,000.

Current population status:

By 1976, the estimated total population of wild Gharial in the world had declined from what is thought to have been 5,000 to 10,000 in the 1940s to less than 200 (Whitaker *et al.* 1974), a decline of about 96%. In 2006, the mature Gharial population in India stands at a similar figure, less than 200 (Andrews 2006, Sharma and Basu, 2004) and less than 35 adults for Nepal (T. Maskey pers. comm. 2006). The species is virtually extinct in Pakistan (Whitaker and Basu 1983), Bangladesh (Whitaker 1976, Khan 1979, Faizuddin 1985) and Bhutan (Singh 1991). Only two records for the species were recorded from Myanmar in 1927 (Thorbjarnarson *et al.* in press) and it is presumed long extinct.

The drastic decline in the Gharial population over the last 60 years (three generations for the gharial) can be attributed to a variety of causes including over-hunting for skins and trophies, egg collection for consumption, killing for indigenous medicine, and killing by fishermen (for example: Biswas 1970 and Whitaker 1975). While hunting is no longer considered to be a significant threat, the construction of dams, barrages, irrigation canals, siltation, changes in river course, artificial embankments, sand-mining, riparian agriculture, and domestic and feral livestock have combined to cause an extreme limitation to gharial range due to this excessive, irreversible loss of riverine habitat. For instance, Hussain (2001) documents plans for 276 irrigation projects in the Chambal River basin alone. These threats have not ceased, indeed have increased and continue to compromise the survival of the species. Gharial decline has gone hand in hand with the decline of other riverine taxa once reportedly abundant and now endangered including the Ganges River Dolphin (*Platanista gangetica*) and the Mugger crocodile (*Crocodylus palustris*) as well as numerous waterfowl and well known game and edible fish species including the Mahseer (*Tor* sp.) and Hilsa (*Hilsa ilisha*).

Based on the above, the Gharial qualifies for CR under Criterion A2bc. However, the lack of quantitative population estimates for three generations in the past makes the calculation of exact rates of decline over the period problematic (see Table 1 in the Supplementary Material for further information on how the reduction was calculated).

bRationale for Criterion C:

Once thought to be relatively stable or even increasing, the wild population of gharials has undergone a drastic decline over the last nine years. This decline, as outlined below, qualifies it for Critically Endangered listing.

The mature Gharial population was estimated by using gharial nest counts as they are easily visible and can be counted at well known locations that have been monitored for decades. This is also a more accurate assessment for numbers of mature animals because of the unknown number of immature males (which take five or more years longer to mature than do females) that are routinely counted as 'adults'. Using the only published data on ratios of males in the mature Gharial population (Hussain 1999), it can be inferred that 14% of all 'adults' reported in Gharial censuses are actually subadult males.

The Chambal River holds by far the largest breeding subpopulation with an estimated 48% of the total population. The total number of nests found in the Chambal Sanctuary in 2006 was 68. The only other large breeding population of gharial in India is in the Katarniaghat Wildlife Sanctuary where 20 nests were found in 2006. The one other known breeding population in India is the Son River Sanctuary where two nests were found in 2006 (Andrews 2006).

Since most female Gharial nest every year in captivity, it is reasonable to assume that the above cited nest counts indicate the presence of 90 reproducing female Gharial in India. Assuming that the sex ratio reported by Hussain (1999) in the Chambal of 14% males is the same in Katarniaghat and Son, there would be an inferred total of 13 mature male gharials throughout India. Considering the reported paucity of mature males (being very conspicuous with their gharas) on the Chambal in the surveys of 2005 and 2006, it is likely that there are extremely few mature males in that river (Andrews 2006, R.J. Rao pers. comm.). Along with a total of 20 nesting females, six mature male Gharial were counted by independent observers in 2006 (B.C. Choudhury, H.V. Andrews, R. Whitaker, pers. obs.). The total estimated number of mature Gharial in the three remaining wild breeding subpopulations in India is therefore 107 based on observed nest numbers and inferred numbers of mature males.

Other crocodilians are reported to nest less frequently than every year. Estimates of reproductive frequency (% females laying per year) range from 10% to 90% with a median value of 63% (Thorbjarnarson 1996). Although we believe that most gharials nest annually, some females may have migrated downriver away from where the few males still exist. Applying this median crocodilian value to our estimate and adding the estimates for all Indian and Nepal subpopulations would only increase it to 220, still below the numerical threshold for Critically Endangered using criterion C.

There are two other small, non-reproducing populations of Gharial in India (Ken River in Madhya Pradesh and Mahanadi River in Orissa) and three in Nepal (Kosi, Karnali and Babai Rivers) which have been supplemented by the reintroduction of captive bred stock (as in all present Gharial locations). There may also still be a few scattered Gharial in the Brahmaputra River of Northeast India but there have been no confirmed sightings since 1993 (Choudhury 1997). These other subpopulations of Gharial in India contain a total estimated 40 mature animals (no mature males reported). It is extinct in the Indus (Pakistan/India) and Irrawaddy (Myanmar) river systems.

In Nepal six nests were counted in 2006 and the total mature gharial in all subpopulations in that country is estimated at 35 animals (Maskey 1999 and pers. comm. 2006).

Based on these estimates the number of wild, mature gharials across the species' range (presently only India and Nepal) is 182 in about eight non-contiguous, fragmented habitats (but until further research

tells us otherwise, note that 14% of these 'adults' can be inferred to actually be subadult males bringing the total figure down to 157).

In 1997, the peak year with the highest number of wild mature gharials and nests recorded in the last 30 years, 226 mature animals and 81 nests were recorded in the Chambal (Sharma and Basu 2004). There were no nests in the Son, where there were about 10 adults and no nest data for Katarniaghat where an estimated 30 adults were present. No nesting data from Nepal exist for this period, but Maskey (1999) estimated 36 adults present. Based on the available data (Maskey 1999, Sharma and Basu 2004), and adding the 1997 estimated numbers of non-breeding mature animals (in small subpopulations outside of the three Indian and one Nepali breeding subpopulations - a total of 50 animals), the estimated total mature gharial population throughout its present range (India and Nepal) in 1997 was 436.

The decline from an estimated 436 adult gharials in 1997 to 182 in 2006 represents a 58% drop across its range. This drastic decline has happened with a period of nine years, well within the span of one generation, qualifying the Gharial, under criterion C1, to be listed as Critically Endangered. Using the highly conservative estimate of 220 (based on only 63% of the adult females nesting annually) this is a 36% decline, still well within the 25% decline criteria for Critically Endangered (see Table 2 in the Supplementary Material for details of declines by subpopulation).

Conclusion:

The Gharial has undergone both chronic long term and a rapid short-term declines. The use of Criterion A illustrates the long term decline, which was in part addressed during conservation efforts for this species in India and Nepal during the 1970s and 1980s. However, a more recent, very rapid decline has been taking place in the last surviving subpopulations and is cause for considerable alarm. The use of criterion C here, effectively demonstrates that the gharial qualifies for a listing of Critically Endangered, which we think will be an important first step towards galvanizing renewed conservation efforts for this unique species.

For further information about this species, see [Supplementary Material](#).

Previously Published Red List Assessments

1996 – Endangered (EN)

1994 – Endangered (E)

1990 – Endangered (E)

1988 – Endangered (E)

1986 – Endangered (E)

1982 – Endangered (E)

Geographic Range

Range Description:

The western-most historic occurrence of the Gharial was the Indus River in present day Pakistan and the eastern-most (albeit from only two records in the scientific literature) was the Irrawaddy River in

present day Myanmar (see Figure 1 in the Supplementary Material). Today three widely separated breeding subpopulations are left in India (Chambal River, Girwa River and Son River) and one in Nepal (Rapti/Narayani River) (see Figure 2 in the Supplementary Material).

For further information about this species, see [Supplementary Material](#).

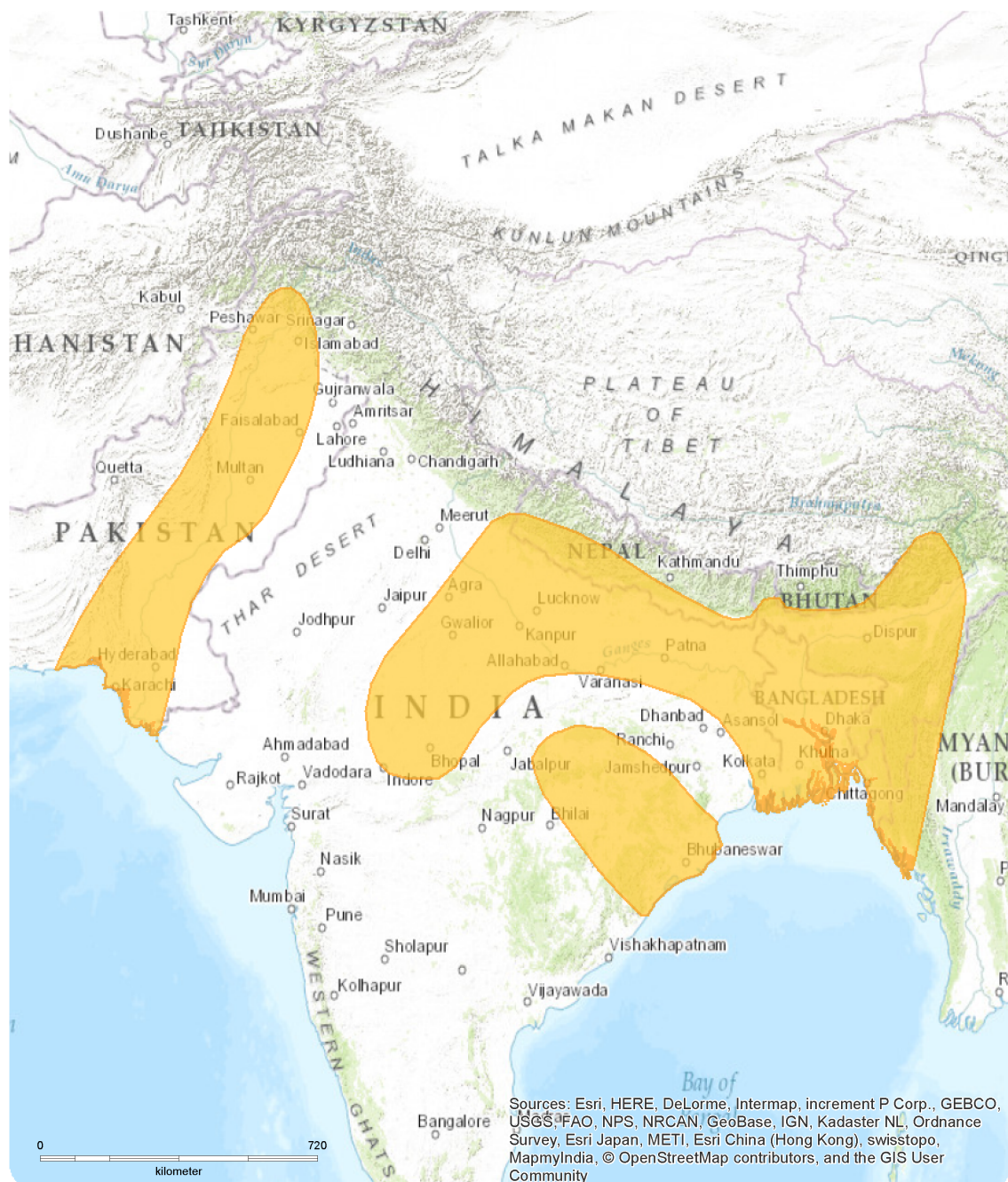
Country Occurrence:

Native: India (Bihar, Uttar Pradesh); Nepal

Possibly extinct: Bangladesh; Bhutan; Pakistan

Regionally extinct: Myanmar

Distribution Map

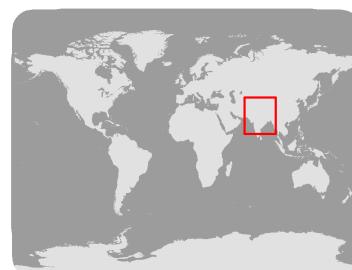


Gavialis gangeticus

Range

Extant (resident)

Compiled by:
IUCN (International Union for
Conservation of Nature)



The boundaries and names shown and the designations used on this map do not imply any official endorsement, acceptance or opinion by IUCN.



Population

See Justification (above).

Current Population Trend: Decreasing

Habitat and Ecology (see Appendix for additional information)

Indian Gharial nest in seasonally exposed sandbanks along slow moving sections of large to medium sized rivers. Gharials congregate for mating and nesting during the dry season in these highly seasonal rivers. When concentrated in these areas they are highly vulnerable to impacts from fishing and malicious killing. The nests are also vulnerable as they traditionally are laid in the same beaches year after year and in some habitats (Girwa River in India and Rapti/Narayani River in Nepal) the eggs are relished by tribal people.

Systems: Terrestrial, Freshwater

Threats (see Appendix for additional information)

Alteration of habitat: throughout all of the present range of the Gharial their rivers have been dammed; diverted for irrigation and other purposes leading to seasonal drying of once perennial rivers (unlike many other crocodilians gharial cannot walk overland to find water nor can they tunnel to escape the summer drought; sand mined for construction on a huge scale; and looming ahead is a mega-project to interlink all of India's major rivers which will be a catastrophe for all river life.

Fishing: intensity of fishing is increasing and use of gill nets is rapidly killing many of the scarce adults as well as many subadults. This danger is prevalent throughout most of the present gharial habitat, even the protected areas.

Agriculture and grazing: riparian people are some of the poorest in India and depend almost entirely on local resources and their own agriculture to survive. During the dry months when the river is down, planting gourd crops and herding livestock for drinking and grazing on the sand banks and river edges has become prevalent all along the Chambal River in particular. These are the very sand banks used by gharial for nesting and basking and these anthropogenic activities take place in the breeding season.

Utilization: Use of the ghara (narial excrescence in adult male Gharial), penis and fat for medicines has been traditional and is still reported from Nepal and occasionally in India. Considering the fact that there may be below 20 adult males left in the wild, continued use is a major threat.

Gharial eggs are sought by tribal people to eat and in the Girwa River (the Katarniaghat Sanctuary) it was reported that almost all the nests had been raided by humans during the nesting seasons of 2001 to 2005. The reported high hatchling rates in 2006 are attributed to the enforcement efforts carried out this year by the Wildlife Warden and his staff.

Conservation Actions (see Appendix for additional information)

Conservation programs for Indian Gharial have been undertaken in India and Nepal, based on the establishment of protected areas and restocking these with animals born in captivity.

From one perspective it could be argued that over 5,000 juvenile Gharial were released into largely inhospitable habitats in Indian and Nepali rivers and left to their fate. In Chitawan National Park, Nepal, where about 300 gharials were released, there were 16 nests in 1977 and in 2006 there were six. So reintroduction didn't work so well there (though it is argued that at least total extinction has been averted by supplementation), thanks largely to growing and uncontrolled anthropogenic pressures, including depletion of the fish resources. Gharial are generally grown for two to three years and average about one meter TL when released. While the programme calls for monitoring, it has not been consistently carried out and little research on adaptation, migration and other key aspects have been conducted.

In the Girwa River (Katarniaghat Sanctuary), where 909 Gharial were released (including 112 in 2006), there were four nests recorded in 1977 and 20 in 2006, so 16 nesting females (2% of the total pre-2006 releases) resulted from 30 years of reintroductions. This is seemingly not a great achievement for the money and effort spent, and as several knowledgeable researchers have suggested, perhaps carrying capacity has been reached there.

In the third, and most important remaining Gharial breeding habitat, the Chambal River (the tri-state, National Chambal Sanctuary) where 3,552 Gharial were released (Whitaker and Andrews 2003) (plus 224 in 2006), there were 12 nests recorded in 1978 and 68 in 2006. While nesting has increased by over 500%, these recruited mature, reproducing females are only about 2% of the total number released. As has been pointed out many times, the linear, riverine habitat of the Gharial is an extreme disadvantage with annual monsoonal flooding when the newly hatched young are especially prone to being flushed downstream out of the protected areas.

With recruitment or retention of reintroduced Gharial (plus natural recruitment) over the last 30 years being as low as 0.02% (Mahanadi River, Orissa) and averaging 3% to 10% elsewhere, the entire reintroduction strategy needs to reassessed. Scarce conservation funds and human resources need to be also focused on other rigorous actions such as habitat assessment, fisheries enhancement and conflict mitigation, educating river people concerning conservation efforts in order to improve the survival odds of the Gharial. It should be noted that the four places where Gharial are still breeding today all had residual populations when the restocking programmes began. Nowhere has restocking re-established a viable Gharial population.

The Gharial is listed on CITES Appendix I and on CMS Appendix I.

Credits

Assessor(s): Choudhury, B.C., Singh, L.A.K., Rao, R.J., Basu, D., Sharma, R.K., Hussain, S.A., Andrews, H.V., Whitaker, N., Whitaker, R., Lenin, J., Maskey, T., Cadi, A., Rashid, S.M.A., Choudhury, A.A., Dahal, B., Win Ko Ko, U., Thorbjarnarson, J & Ross, J.P.

Reviewer(s): Fergusson, R., Elsey, R., Velasco, A. & Dacey, T. (Crocodile Red List Authority)

Bibliography

- Adams, A.L. 1867. *Wanderings of a Naturalist in India*. Edmonton and Douglas, Edinburgh.
- Andrews, H. 2006. Status of the Indian Gharial (*Gavialis gangeticus*), Conservation Action and Assessment of Key Locations in North India. Report to the Madras Crocodile Bank Trust.
- Baillie, J. and Groombridge, B. (eds). 1996. *1996 IUCN Red List of Threatened Animals*. pp. 378. International Union for Conservation of Nature, Gland, Switzerland and Cambridge, UK.
- Biswas, S. 1970. A preliminary survey of Gharial on the Kosi River. *Indian Forester* 96(9): 705-710.
- Choudhury, A. 1997. Status of Gharial in Arunachal Pradesh. *Crocodile Specialist Group Newsletter* 16(3): 8.
- Crocodile Specialist Group. 2012. Specialist Group website. Available at: <http://www.iucncsg.org/>.
- Faizuddin, M. 1985. Distribution, abundance and conservation of gharials in Bangladesh. *Tigerpaper* 12(3): 22-23.
- Francis, R. 1910. The Broad-snoutedMugger in the Indus. *Journal of the Bombay Natural History Society* 20: 1160.
- Groombridge, B. 1982. *The IUCN Amphibia-Reptilia Red Data Book, Part 1: Testudines, Crocodylia, Rhynchocephalia*. IUCN, Gland, Switzerland.
- Groombridge, B. (ed.). 1994. *1994 IUCN Red List of Threatened Animals*. IUCN, Gland, Switzerland and Cambridge, UK.
- Hornaday, W.T. 1885. *Two Years in the Jungle*. Charles Scribner's Sons, NY. (See pp 39 – 57).
- Hussain, S.A. 1999. Reproductive success, hatchling survival and rate of increase of Gharial *Gavialis gangeticus* in National Chambal Sanctuary, India. *Biological Conservation* 87: 261-268.
- Hussain, S.A. and Badola, R. 2001. Integrated Conservation Planning for the Chambal River Basin: A Landscape Level Perspective. National Workshop on Regional Planning for Wildlife Protected Areas, New Delhi (Wildlife Institute of India).
- I.A.K. 1921. Crocodile shooting in Nepal. *Journal of the Bombay Natural History Society* 28: 291.
- IUCN. 1990. *IUCN Red List of Threatened Animals*. IUCN, Gland, Switzerland and Cambridge, UK.
- IUCN. 2007. 2007 IUCN Red List of Threatened Species. Available at: www.iucnredlist.org. (Accessed: 12th September 2007).
- IUCN Conservation Monitoring Centre. 1986. *1986 IUCN Red List of Threatened Animals*. IUCN, Gland, Switzerland and Cambridge, UK.
- IUCN Conservation Monitoring Centre. 1988. *IUCN Red List of Threatened Animals*. IUCN, Gland, Switzerland and Cambridge, UK.
- Khan, M.A.R. 1979. Gharial extinct in Bangladesh. *Crocodile Specialist Group Newsletter* 1: 2.
- Maskey, T.M. 1999. Status and conservation of Gharial in Nepal. In: *ENVIS Wildlife & Protected Areas*, Vol 2(1), pp. 95-99. Wildlife Institute of India, Dehra Dun.
- Rao, C.J. 1933. Gavial on the Indus. *Journal of the Sind Natural History Society* 1(4): 37.

Rao, R.J., Basu, D., Hasan, S.M., Sharma, B.B., Molur, S. and Walker, S. (eds). 1995. *Population and Habitat Viability Assessment (PHVA) Workshop for Gharial*. PHVA Workshop, 16-18th January 1995. Zoo Outreach Organization/CBSG, India, Coimbatore.

Sharma, R. and Basu, D. 2004. Recent reversals in the population trends in the population of Gharial in the National Chambal Sanctuary in North India; implications and a suggested strategy for the conservation of one of the world's most endangered crocodilians. In: Crocodile Specialist Group *Crocodiles. Proceedings of the 17th Working Meeting of the Crocodile Specialist Group*, pp 180-186. IUCN, Gland, Switzerland.

Shortt, W.H.O. 1921. A few hints on crocodile shooting. *Journal of the Bombay Natural History Society* 29: 77.

Singh, L.A.K. 1991. Distribution of *Gavialis gangeticus*. *Hamadryad* 16(1 & 2): 39-46.

Thorbjarnarson, J.B. 1996. Reproductive characteristics of the Crocodylia. *Herpetologica* 52(1): 8-24.

Thorbjarnarson, J., Platt, S.G., Win Ko Ko, Khin Myo Myo, Lay Lay Khaing, Kalyar and Holmstrom, B. 2006. Crocodiles in Myanmar: Species diversity, historic accounts, and current population status and conservation. *Herpetological Natural History* 10: 67-79.

Whitaker, R. 1975. Status and conservation of the Gharial. *Herpetological Review* 6(1): 1-3.

Whitaker, R. 1976. Gharial survey report. Mimeographed report for the New York Zoological Society, pp. 1-19.

Whitaker, R. and Andrews, H.V. 2003. Crocodile conservation, Western Asia region: an update. *Journal of the Bombay Natural History Society* 100(2&3): 432-445.

Whitaker, R. and Basu, D. 1983. The Gharial (*Gavialis gangeticus*): A review. *Journal of the Bombay Natural History Society* 79(3): 531-548.

Whitaker, R., Rajamani, V., Basu, D. and Balakrishnan, V. 1974. Preliminary survey of the Gharial, *Gavialis gangeticus*. Madras Snake Park Trust Report, pp. 1-16.

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Appendix

Habitats

(<http://www.iucnredlist.org/technical-documents/classification-schemes>)

Habitat	Season	Suitability	Major Importance?
5. Wetlands (inland) -> 5.1. Wetlands (inland) - Permanent Rivers/Streams/Creeks (includes waterfalls)	-	Suitable	-

Threats

(<http://www.iucnredlist.org/technical-documents/classification-schemes>)

Threat	Timing	Scope	Severity	Impact Score
2. Agriculture & aquaculture -> 2.1. Annual & perennial non-timber crops -> 2.1.2. Small-holder farming	Ongoing	-	-	-
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation 2. Species Stresses -> 2.2. Species disturbance		
3. Energy production & mining -> 3.2. Mining & quarrying	Ongoing	-	-	-
	Stresses:	1. Ecosystem stresses -> 1.1. Ecosystem conversion 1. Ecosystem stresses -> 1.2. Ecosystem degradation		
5. Biological resource use -> 5.4. Fishing & harvesting aquatic resources -> 5.4.3. Unintentional effects: (subsistence/small scale)	Ongoing	-	-	-
	Stresses:	2. Species Stresses -> 2.1. Species mortality		
6. Human intrusions & disturbance -> 6.3. Work & other activities	-	-	-	-
	Stresses:	2. Species Stresses -> 2.2. Species disturbance		
7. Natural system modifications -> 7.2. Dams & water management/use -> 7.2.4. Abstraction of surface water (unknown use)	Ongoing	-	-	-
	Stresses:	1. Ecosystem stresses -> 1.2. Ecosystem degradation		
7. Natural system modifications -> 7.2. Dams & water management/use -> 7.2.11. Dams (size unknown)	Ongoing	-	-	-
	Stresses:	1. Ecosystem stresses -> 1.1. Ecosystem conversion 1. Ecosystem stresses -> 1.2. Ecosystem degradation		

Conservation Actions in Place

(<http://www.iucnredlist.org/technical-documents/classification-schemes>)

Conservation Actions in Place
In-Place Land/Water Protection and Management

Conservation Actions in Place
Occur in at least one PA: Yes
In-Place Species Management
Successfully reintroduced or introduced benignly: Yes
Subject to ex-situ conservation: Yes
In-Place Education
Included in international legislation: Yes
Subject to any international management/trade controls: Yes

Conservation Actions Needed

(<http://www.iucnredlist.org/technical-documents/classification-schemes>)

Conservation Actions Needed
1. Land/water protection -> 1.2. Resource & habitat protection
2. Land/water management -> 2.1. Site/area management
4. Education & awareness -> 4.3. Awareness & communications

Research Needed

(<http://www.iucnredlist.org/technical-documents/classification-schemes>)

Research Needed
0. Root -> 100.1. OLD 1.1.1-Policy-base actions->Management plans->Development
3. Monitoring -> 3.1. Population trends

Additional Data Fields

Habitats and Ecology
Movement patterns: Full Migrant

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