

Reeves, R.R., B.D. Smith and T. Kasuya. 2000. Biology and Conservation of Asian River Cetaceans. IUCN Occasional Paper No. 23.

Executive Summary

Occasional Paper No. 23 Biology and Conservation of Asian River Cetaceans

River dolphins and porpoises are among the world's most threatened mammal species. They inhabit some of the largest river systems of southern Asia, and their environmental requirements link them to food and water-security issues in the world's most densely populated human environments. River cetaceans historically ranged upstream from the estuarine zone to rocky barriers and shallow reaches in headwater streams. Populations of river cetaceans have declined dramatically in recent years and much of their range has been lost.

River cetaceans are threatened in many ways. Over-harvesting of fish and crustaceans reduces the availability of their prey. Deforestation and intensive floodplain farming increase the sediment load of river channels and degrade cetacean habitat. Industrial effluents, human sewage, mining waste, and agricultural runoff contaminate water quality. Dolphins and porpoises die from accidental entanglement in gill nets, and mortality rates increase as the use of these nets spreads. Possibly the most significant threat to river cetaceans is the construction of large water development structures, most notably dams, barrages, and levees.

The environmental consequences of water development projects are significant and far reaching. These structures fragment populations and reduce the environmental complexity that makes rivers suitable for aquatic species. Water development proceeds, however, with little understanding or concern about the effects on cetaceans, or on the assemblage of other life that shares their habitat.

This volume brings together current information on the status of Asian freshwater cetacean populations, the factors that have caused their recent declines, and what can be done to improve their chances for survival. All of the species or populations in question are classified as Endangered or Critically Endangered in the 1996 IUCN Red List of Threatened Animals.

The baiji (*Lipotes vexillifer*), an endemic dolphin species in the Yangtze River of China, is the world's most critically endangered cetacean with a population estimated at only a few tens of individuals. The recent decline in baiji abundance has been attributed to excessive bycatch in fisheries, reduced abundance of prey due to overfishing, and severe degradation of the Yangtze environment. A last-ditch effort to capture the remaining individuals for translocation to a "semi-natural reserve" has been

unsuccessful, and there is little hope for the survival of this species.

A second cetacean species shares the Yangtze River system with the baiji. The finless porpoise (*Neophocaena phocaenoides*) population in the Yangtze is the world's only freshwater-adapted population of porpoises. Yangtze finless porpoises are considered a subspecies, and they appear to be morphologically, behaviorally, and genetically different from the marine finless porpoises that occur in Chinese coastal waters and elsewhere in eastern and southern Asia. Although population estimates are crude, there are thought to be at least hundreds, and perhaps a few thousand, finless porpoises remaining in the Yangtze system, including Dongting and Poyang lakes. The species is legally protected (as is the baiji), but factors similar to those that have caused the demise of the baiji are operating on the finless porpoise - incidental killing, loss of high-quality habitat, reduced food supplies, and pollution. A small group of porpoises inhabits the "semi-natural reserve" that was originally designed for baiji, but ex situ conservation efforts are not particularly promising. While the finless porpoise seems to have been better able than the baiji to tolerate the deteriorating conditions in the Yangtze River over the last several decades, its future is highly uncertain.

Dolphins inhabit several large rivers of southern Asia. Two closely related species are covered in this volume: the Ganges susu (*Platanista gangetica*) and the Indus bhulan (*Platanista minor*). These are obligate river dolphins that occurred historically from the deltaic zones upriver to the mountain foothills where rapids blocked their dispersal. Another unrelated dolphin species, the Irrawaddy dolphin (*Orcaella brevirostris*), occurs far up the Ayeyarwady (Irrawaddy, hence the name) and Mekong rivers of Southeast Asia but it, like the finless porpoise, also inhabits marine coastal waters. None of the papers or reports in this volume deals in-depth with the freshwater populations of Irrawaddy dolphins, but in the future, they should be included in the category "Asian freshwater cetaceans." These populations are subject to many of the same threats and are in urgent need of assessment and protection.

The Ganges susu occurs in the inland waters of Bangladesh, India, and Nepal. Its traditional strongholds have been the Ganges, Brahmaputra, Meghna, and Karnaphuli river systems. Susus still occur in these rivers and, at least seasonally, in many of their tributaries. There are at least a few hundred susus in both the Ganges and Brahmaputra systems, and their total abundance may be in the low thousands. However, with the extensive development of irrigation, flood control, and hydroelectric projects in Asian rivers, the susu's metapopulation has become increasingly fragmented. Groups of dolphins upstream of dams and barrages have either disappeared or declined with little prospect of recovery. Susus are caught incidentally in fisheries and are also hunted deliberately in portions of their range in both India and

Bangladesh. There is a strong localized demand for their oil to be used as a fish attractant and as medicine or liniment. Despite valiant efforts by conservationists in all three of the range states, the susu is almost certainly losing ground in the face of overwhelming human demands on freshwater resources, including the water itself.

The same is true of the Indus bhulan, whose historic range included the entire navigable length of the Indus mainstem as well as several of its large tributaries. As dams and barrages have subdivided the Indus, the bhulan population's range has progressively shrunk. Today, significant numbers of dolphins occur in only three discrete river segments, with a total population of only hundreds. The species' fate rests entirely in the hands of Pakistan, a nation burdened with a chronic shortage of freshwater resources to sustain its growing human population. Although the bhulan is officially protected, it must compete with humans for Indus water. The problems of bycatch and pollution affect the bulan as they do the susu.

This volume includes three meeting reports and 14 papers. Two of the meetings were held in Bangladesh in 1997 - a meeting of the Asian River Dolphin Committee and a workshop on the effects of water development on river cetaceans. The third was held in Hong Kong in 1997 to develop a conservation plan for the Yangtze population of finless porpoises.

In addition to the aforementioned workshop report, there are three papers on water development issues. The first is a register compiled by a team of scientists, listing and mapping water development projects (dams, barrages, embankments, ship locks, etc.) in Asia that have affected river cetaceans. The second paper reviews water development projects in China and how they are thought to have affected baiji and finless porpoise populations. The third focuses on Farakka Barrage in eastern India and provides a detailed examination of how the barrage and its associated structures have affected the susu.

One paper contains data on the behavior of baiji. The authors ruefully note that their observations of baiji in the wild may be the last ever reported for this doomed species.

Two research papers on the Ganges susu are included. In one of them, a team of scientists present a synthesis of available data on the species' occurrence in the Ganges and its tributaries. This is the first time anyone has attempted a comprehensive review of the susu's status in the entire Ganges system. The second paper is a summary of what is known about occurrence of the susu, or "shushuk" as it is called locally, in the Karnaphuli River and several smaller rivers of southeast Bangladesh.

Three papers, in addition to the workshop report, are devoted to the Yangtze

finless porpoise population. The first of these provides a summary of work done at the Wuhan Institute of Hydrobiology and includes information on the animals brought into the baiji "semi-natural reserve." The second is a preliminary analysis of genetic differences between the finless porpoises in the Yangtze River and those in marine coastal waters of China. The third paper contains the results of surveys conducted in the lower Yangtze by a team of researchers from Nanjing Normal University.

In the final section of the volume, five papers address methods for studying freshwater cetaceans. These include reviews of survey methods and of genetic and demographic issues related to conservation of small, fragmented cetacean populations. One of the papers is a field report on the use of specially designed "vests" for attaching telemetry devices to finless porpoises. Finally, two papers are included on river dolphins in South America. In one study, botos (*Inia geoffrensis*) were captured alive, sampled, instrumented with radio tags, and released. In the other, standard surveys of botos and tucuxis (*Sotalia fluviatilis*) in the upper Amazon were used to investigate habitat preferences of the two species. The purpose of this section is to provide Asian scientists with fresh ideas about how they might pursue their own research and conservation efforts with river cetaceans.

The Cetacean Specialist Group of the IUCN Species Survival Commission has regarded freshwater and coastal small cetaceans as its highest priority for more than a decade. Unfortunately, although much has been learned in recent years about where these animals occur and how many there are, very little progress has been made in improving their chances for survival. Bycatch is a major threat wherever certain kinds of fishing, particularly gillnet fishing, are practiced. There is no reason to believe that any cetacean population in an Asian freshwater system is sufficiently robust, or well enough studied, to be subject to sustained-yield exploitation, whether deliberate or accidental. River damming has the direct effect of dividing dolphin populations for large parts of the year, if not permanently. In addition, flow regulation, diversion, and channelization are known to alter geomorphic processes and to degrade downstream habitat for both dolphins and their prey. The threats to human health posed by the contamination of inland fresh waters with artificial chemicals, sewage, and agricultural runoff should be sufficiently alarming to prompt remedial action, so that it would be unnecessary to invoke concern about the effects on cetaceans. Yet in spite of what is known, these threats continue largely unchecked in Asian rivers.

The baiji is deemed a "national treasure" in China, in some respects rivalling the giant panda (*Ailuropoda melanoleuca*) as an animal worthy of extreme efforts to ensure its survival. The baiji's imminent extinction is a national tragedy and an international disgrace. The story of the baiji's decline, tied as it is to the rampant degradation of a once-productive river

system, needs to be told and re-told. Its message - that our freshwater resources are exhaustible and that a river's capacity for serving human needs is finite - can be applied in other contexts, including some in Asia where other small cetaceans are in trouble and headed in the same direction as the baiji.