River Dolphin Strategy 2018 – 2030

Global priorities for conservation

Reviewed by

Randall Reeves, Chair IUCN, Cetacean Specialist Group

Gill Braulik, IUCN/Cetacean Specialist Group

Nicola Hodgins, Whale and Dolphin Conservation

The River Dolphin Strategy was written by Uzma Khan, Global River Dolphin Initiative Lead, with contributions from many colleagues Aimee Leslie (WWF Peru), Asghar Nawab (WWF India), Diego Fernando Amorocho Llanos (WWF Colombia), Danielle Kreb (Yasi, Indonesia), Fernando Trujillo (Omacha Foundation), Hamera Aisha (WWF Pakistan), Jordi Surkin (WWF Bolivia), Jose Luis Mena (WWF Peru), Jose Usma Soule (WWF Colombia), Jorge Rivas (WWF Ecuador), Lila Sainz (WWF Bolivia), Marc Goichot (WWF Cambodia), Marcelo Olivier (WWF Brazil), Muhammad Imran Malik (WWF Pakistan), Miriam Marmontel (Mamiraua Institute, Brazil), Philip Leonard (WWF International), Rajesh Sada (WWF Nepal), Shannon Siyao Wang (WWF Greater Mekong), Somany Phay (WWF Cambodia), Suresh Babu (WWF India), Prof. Wang Ding (Chinese Academy of Sciences), and Xinqiao Zhang (WWF China).

WWF is one of the world's largest independent conservation organizations, with over five million supporters and a global network active in more than 100 countries. WWF's mission is to stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature, by conserving the world's biological diversity, ensuring that the use of renewable natural resources is sustainable, and promoting the reduction of pollution and wasteful consumption.

Introduction

This River Dolphin Strategy (2018–2030) is the culmination of WWF's longstanding commitment to the conservation of the world's river dolphins. In 2016, during a WWF meeting in Woking, UK, there was a strong consensus that the WWF Freshwater Practice should lead the conservation of river dolphins because of the overarching issue of water management and its relevance to all freshwater cetaceans and their habitat. As a consequence, the Freshwater Practice selected river dolphins to act as freshwater ambassadors since promoting them as flagship species and indicators of healthy rivers can help to achieve much-needed habitat protection and improve river basin governance, which will also improve the survival prospects of many other threatened species in freshwater ecosystems. Along with the Freshwater Practice, the work of WWF's Food, Markets, Wildlife, Climate & Energy, and Governance Practices will also directly and indirectly contribute to the conservation of freshwater cetaceans. Within the Freshwater Practice's strategy, Areas of Collective Actions and Innovation – such as water stewardship, finance, and dams & infrastructure – will all strengthen WWF's work on freshwater cetaceans.

WWF aims to mobilise a powerful global community of partners to secure the longterm future of river dolphins and the communities that depend on healthy, productive freshwater ecosystems. *'River Dolphins Times Two (DRx2)'* is an ambitious strategy that aims to 'bend the curve' for river dolphins in both Asia and South America – doubling the population in Asia and halting and then reversing the negative trend in South America. The recommendations included in this strategy resulted from a consultative process, which began with a workshop in March 2018 involving WWF's river dolphin leads as well as a number of external experts and partners, including the chair of the IUCN-SSC Cetacean Specialist Group and the Chinese Academy of Sciences (China), Omacha Foundation (Colombia), Yayasan Konservasi RASI (Indonesia) and the Mamirauá Institute for Sustainable Development (Brazil).

River dolphins are restricted to freshwater ecosystems and the obligate freshwater species in particular differ morphologically and phylogenetically from marine dolphins. One hypothesis is that these dolphins evolved from marine cetacean ancestors in the middle Miocene epoch some 15 to 25 million years ago when sea levels were high and many present-day river basins were inundated (Hamilton *et al.*, 2001). The distributional range of river dolphins in southern Asia has been reduced by 50-70 per

cent (Braulik, 2006) since the 19th century (Anderson, 1879) due to water infrastructure development that restricts their movements and degrades their habitat.

River dolphins and human communities both rely on healthy aquatic systems and similar threats affect them both, therefore a serious and sustained effort is needed to protect vulnerable riverine communities and freshwater cetacean populations. The threats common to all river dolphin species are too massive and complex to be dealt with country-by-country or species-by-species: a global effort to secure the future of river dolphins and their freshwater environments is critical.

All River Dolphins Are Threatened

River dolphins are revered by many local cultures and numerous legends are attached to them. For example, the baiji was regarded as the goddess of the Yangtze, while the Ganges dolphin is a companion of the Goddess Ganga. In the Amazon, the boto is said to transform into a handsome man when the moon is full who leaves girls in love, while some communities in Indonesia believe that the river dolphins in the Mahakam River are the descendants of two naughty, hungry children, who ate a shaman's hot rice without permission and afterwards jumped into the river to shed the heat and were transformed into dolphins. However, despite being revered by local and indigenous communities in many countries, all river dolphins currently face severe threats.

The IUCN Red List presently includes assessments of four freshwater cetacean species – the South Asian river dolphin (*Platanista gangetica)*, Amazon River dolphin (*Inia geoffrensis)*, tucuxi *(Sotalia fluviatiles)* and baiji (*Lipotes vexillifer)*.[1] It also includes assessments of several subspecies of those species – susu (*P. g. gangetica)*, bhulan (*P. g. minor)*, Bolivian bufeo (*I. g. boliviensis)* and common boto *(I. g. geoffrensis)* – and one subspecies of the mainly marine narrow-ridged finless porpoise (*Neophocaena phocaenoides*) – the Yangtze finless porpoise (*N. p. asiaeorientalis)*. In addition, three freshwater subpopulations of a mainly marine dolphin species, the Irrawaddy dolphin (*Orcaella brevirostris)*, have been red-listed – the Irrawaddy River, Mekong River and Mahakam River subpopulations. The most recent extinction of a river dolphin species was that of the Yangtze River dolphin, or baiji, which at the time of the last assessment (Smith *et al.,* 2017) had not been sighted since 2002. The finless porpoises in China's Yangtze River constitute the only freshwater porpoise population. (Note: All of the above-mentioned species, subspecies and subpopulations are referred to in this

[1] Taxonomy and nomenclature used here is based on determinations made by the Society for Marine Mammalogy's Committee on Taxonomy (see https://www.marinemammalscience.org/species-information/list-marine-mammal-species-subspecies/).

strategy as 'river dolphins'.)

Some populations of freshwater cetaceans that have yet to be recognized as a species or subspecies are geographically and demographically isolated as well as genetically distinct (Hrbek *et al.*, 2014, Kruetzen *et al.,* 2018) and more research is underway to understand if these are distinct species or subspecies. (Zhou *et al.*, 2018). Annex 1 (Asia) and Annex 2 (South America) summarize information about the species, subspecies and subpopulations of freshwater cetaceans.

Ongoing and increasing anthropogenic changes to freshwater ecosystems are putting river dolphins at ever greater risk. The primary cause of mortality of river dolphins is entanglement in gillnets and this is generally regarded as the most immediate human-induced threat. All river dolphins are legally protected in their range states but Asian range states are among the most densely populated countries in the world and also boast rapidly growing economies. All river dolphins live in basins with growing human population pressures and must share their habitat with local communities, which also depend on natural resources. The unsustainable extraction of resources – fish, timber, sand, etc. – is unrelenting due to economic and political priorities, and coordination among or between countries to address environmental conservation is either missing or inadequate. The constantly growing demand for water, linked as it is to security concerns, makes river basin conservation even more complex and challenging.

The threats to river dolphins are both numerous and varied (see details below), but the primary focus of the strategy outlined here is to address those that are most immediate, pervasive and severe, namely:

1) fishing and fishing-related activities;

2) infrastructure projects that affect habitat connectivity (including hydropower dams, irrigation barrages, embankments, etc.) and;

3) mining, agriculture and industrial development that degrade water quality.

Threats to River Dolphins

Fishing, and especially fishing with gillnets, is a major threat to river dolphins as it is for marine mammals globally (Read *et al.*, 2006; Reeves et al., 2013). It was considered a leading cause of the baiji's extinction (Turvey *et al.*, 2007, 2010) and is currently recognized as a threat to virtually all river dolphins (e.g. Wang *et al.*, 2013; Braulik & Smith, 2017; da Silva *et al.*, 2018). In Pakistan, the deaths of 51 Indus dolphins have been attributed to net entanglement since 2008 in a 190km stretch of river (unpublished data, WWF Pakistan). In the Mekong River in Cambodia, at least 153 dolphins died from gillnet entanglement between 2002 and June 2018 (unpublished data, WWF Cambodia), while 67 per cent of dolphin deaths with a known cause between 1995 and 2018 (99 animals) in Indonesia's Mahakam River were attributed to gillnet entanglement (database YK RASI: Danielle Kreb).

Legislation to regulate fisheries is weak and inconsistent, and enforcement is poor in most places. Illegal activities such as fishing with explosives and electrofishing are widespread in many rivers, including the Ayeyarwady, Indus, Mekong, Mahakam and Yangtze. It was reported that in 1970s and 1980s, 40 per cent of baiji deaths were caused by electrofishing (Turvey *et* al., 2007) although direct evidence to support this is lacking. In the Irrawaddy River, electrofishing involving armed men has reportedly undermined the traditional practice of 'cooperative' fishing between fishers and dolphins (Smith *et al.,* 2007). In the Indus River, illegal electrofishing has increased recently, notably killing six dolphins in a single event in 2016 (unpublished, WWF Pakistan). Electrofishing may also be causing declines in dolphin prey populations. Over-exploitation of fish and other organisms and the consequent depletion of prey populations have long been recognized as an indirect threat to marine mammals (DeMaster *et al.*, 2001), although it is exceedingly hard to prove in the case of river dolphins.

The construction of dams and other infrastructure (e.g. hydropower dams, irrigation barrages, improvements to navigation, dikes, embankments, and even roads) is a major and growing concern given the ever-increasing development pressures in South Asia and South America.

Infrastructure alters river flows, which has huge ecological impacts – changing the species composition in waterways, disrupting sediment transport and deposition

patterns, fragmenting habitat and preventing connectivity. For river dolphins specifically, development projects can restrict the animals' movements and fragment populations. Fish passageways in dams and barrages are usually nonexistent or when they do exist, they are either non-functional or only somewhat functional, which means the obstruction still impedes fish migrations. This in turn can cause further declines in dolphin prey populations, particularly those that previously undertook long-range movements upstream for breeding but are now blocked (the ilish or hilsa *Tenualosa ilisha* of South Asian rivers is a prime example). Reservoirs upstream of dams also cause loss of habitat by drowning large areas that are natural fluvial habitat of dolphins and converting these areas into lacustrine systems. For example, the Kaptai dam constructed on the Karnaphuli River in Bangladesh trapped an unknown number of dolphins in the reservoir, which had all apparently disappeared by the late 1990s (Smith *et al* 2001). The proposed Sambor dam in Cambodia would turn a complex, 80km multi-channel stretch of the Mekong and the associated flooded forest into a comparatively sterile lake-like water body, almost certainly uninhabitable over the long term by dolphins.

The numerous dams and other types of water development infrastructure that are currently on the drawing boards in basins across the world are potentially catastrophic. For example, there are now 154 operational dams in the Amazon with another 21 under construction. It is estimated that only 3 free-flowing tributaries will remain in the Amazon if all 277 planned dams are built in the next few decades (Castello *et al.*, 2016). Meanwhile, in India, at least 104 new hydroelectric projects are planned in the state of Aranachal Pradesh alone (Dutta, 2010). In Nepal, the Upper Karnali Hydropower project and the Karnali Chisipani multipurpose project are in late planning stages. As part of the China Pakistan Economic Corridor, the Indus Cascade Project proposes six dams on the upper Indus. Scores of additional dams are planned in the Mekong River Basin, including both the mainstem and tributaries (Ziv *et al.*, 2012). The Sambor and Stung Treng dams would be the furthest downstream on the Mekong's mainstem and, situated in the core habitat of Critically Endangered river dolphins, would likely lead to the extirpation of this river dolphin population in addition to having major impacts on fish populations. The Don Sahong dam is currently under construction in Laos, about 1.5 km from the Cambodia border. This dam is expected to make the trans-boundary pool immediately downstream uninhabitable for the few remaining dolphins in that portion of the river. The pool is gradually becoming shallower due to sedimentation, the blasting and excavation associated with dam construction is severely disturbing the dolphins, and chemical pollution downstream is worsening.

But it is not just dams. Embankments, which are becoming increasingly common along

waterways, reduce fish spawning habitat and interrupt lateral connectivity. Embankments to improve navigation and manage flows are under way or planned in many river dolphin range countries, India and Peru being prime examples.
Deterioration of water quality is another major concern for river dolphins. There are two main sources of pollution:

a) Agriculture and industry – Agricultural runoff and industrial effluents are serious threats to dolphins in Asia. Various studies have shown how industrial effluent is increasing heavy metal levels in the Ganges and Ravi rivers (Paul, 2017; Hamid *et al*., 2016). Heavy metals such as cadmium and lead, which are derived impurities in copper-based pesticides or herbicides associated with palm oil industries as well as coal-mining, are polluting the core areas used by dolphins in Mahakam tributaries (Kreb & Budiono, 2018). High levels of PCB, DDT, aldrin, dieldrin and many other organochlorides have been detected in the blubber of Ganges dolphins in India (Kannan *et al* 1993).

Pollution has led to the growth of *Saprolegnia*, an aquatic fungus that infects Yangtze finless porpoises. In 2016, one porpoise reportedly died in Tian-e-zhou because of severe fungal infections (personal communications with Xinquio Zhang, WWF China).

b) Mining and changes in land use – Gold and coal mining operations are introducing heavy metals into dolphin habitats in many rivers. Coal mining along the Mahakam River in Borneo (Indonesia) changes land use, increases sedimentation in the river, and causes both chemical and noise pollution. Mahakam dolphins are forced to change their daily movement patterns when faced with coal barges traveling through narrow tributaries, and their use of such tributaries has decreased markedly. High levels of cadmium are found in river sections near coal mining sites because the coal is washed before loading and the wastewater enters the river as surface runoff (personal communications with Dr Danielle Kreb).

Mercury poisoning due to gold mining, particularly artisanal and small-scale mining, is a serious problem for both local communities and river dolphins in the Amazon and Orinoco basins. High levels of mercury have been reported in the tissues of both *Inia* and *Sotalia* and also in fish (Mosquera-Guerra *et al* 2018). Gold mining along rivers is also common in Asia but the link between artisanal and small-scale mining and mercury poisoning has not been well researched there. Mercury poisoning due to gold mining has been reported in Myanmar and Indonesia. The tendency of river dolphins to associate with and feed in low-current zones of rivers, where mercury in sediments is concentrated, makes them especially prone to mercury contamination (Smith *et al*,

2007).

Vessel strikes and noise pollution are increasing concerns as the number of vessels involved in tourism, the transportation of goods and people, and fishing continues to rise. In South American rivers, confluences are key habitats for dolphins but are also heavily used by vessels, which heightens the risk of vessel strikes and noise disturbance. Vessel noise may disrupt or mask the animals' ability to communicate and echolocate and thus impair social interactions and foraging efficiency. Noise has also been reported to force animals away from their preferred habitat. In the Yangtze River, an interview study in 2008 (Turvey *et al.* 2013) concluded that a four-fold increase in the annual mortality rate of finless porpoises in the mainstem over the preceding 20 years had been predominantly caused by vessel strikes rather than bycatch in fisheries.

Dredging and sand mining for construction, land reclamation or channel 'improvement' are common in many river basins. Such activities cause major changes to the habitat of river dolphins. In the Yangtze River, dredging to deepen and otherwise 'improve' navigation has been ongoing for decades and more of this is planned in coming decades, which will mean continued modification and deterioration of fish breeding habitat and a concomitant decline in porpoise feeding efficiency. Sand and gravel mining are common in all river basins in Asia, and this can contribute to bank erosion and disrupt the balance between sediment flow and deposition, with impacts on fish breeding habitat. Mining also disrupts river formation as sediment is more likely to be deposited where the mining occurs, causing channels to adjust in response. Sometimes mining also involves hydraulic land blasting (Smith *et al.,* 2007), which impacts both riparian habitat and sediment.

Canal or pool entrapment in the low-water season is a threat to river dolphins in South Asia as well as to Yangtze finless porpoises. In Pakistan, 136 dolphins have been successfully translocated from canals back into the Indus mainstem since 1992, but another 33 died during rescue operations (WWF Pakistan reports). Entrapment has also been documented in Bolivia, India, Cambodia and Indonesia. In recent years, 11 dolphins were rescued from shallow areas in the Orinoco basin, while more than 30 had to be rescued in Bolivia's Rio Grande system after becoming trapped in shallow waters because of extreme drought (personal communications Fernando Trujillo).

Deliberate killing is no longer a major threat to river dolphins in Asia, although killings do still occur throughout the region. However, it is a serious ongoing threat to river dolphins in much of South America (except in the Araguaia River, Brazil) and there is an increasing use of small cetaceans for food and bait with thousands including

botos and tucuxis hunted annually (Altherr and Hodgin, 2018). The flesh and viscera of *Inia* in particular are valued as bait for a prized catfish, the mota or piracatinga. For example, a 450 per cent increase in the annual catch of piracatinga has been reported in some areas of Brazil by using bait derived from boto (Altherr and Hodgins, 2018). **The genetic and demographic impacts of inbreeding** are also a concern, especially for small, isolated populations, many of which are the result of habitat fragmentation caused by dams and other river modifications. Such impacts on river dolphins are not well understood but the loss of genetic diversity and the demographic and stochastic effects of small effective population size are matters that deserve more attention, especially for the small freshwater populations of Irrawaddy dolphins, Indus dolphins, and Yangtze finless porpoises as well as the often very small subpopulations of *Inia* trapped between dams in South America.

Climate change is almost certainly having an impact on river dolphins, although the links are poorly understood at present. It is important to consider not only the possible direct effects of climate change on the animals and their habitat, but also the fact that climate change may be aggravating the impacts of other threats. A number of extreme weather events that were possibly linked to climate change have affected river dolphins. In 2008, the Tian-e-Zhou oxbow on the Yangtze froze for the first time in recorded history, and at least six of the finless porpoises in the semi-natural reserve died after being injured while trying to create breathing holes (WWF China 2017). Similarly, at least 19 Indus dolphins died during the flood of 2010 either because they crashed into the barrages or became stranded in far-flung areas and could not be rescued. The modification of habitat by human activities has certainly played a major role in such events, while some efforts to protect communities have had unintended consequences. For example, boulders that have been placed in sections of the Yangtze to protect human communities from floods have damaged fish breeding habitat (personal communications Prof Wang Ding).

Changes in livelihoods and insufficient opportunities for people exacerbate other threats. In Pakistan, fishing pressure in the Indus is increasing because an individual licensing system, which replaced the traditional contract system in Sindh province, has encouraged more people to take up fishing as a livelihood. In the Amazon basin, only 3.5 million people are indigenous while 31 million have moved into the region from other areas. This demographic trend is driven by a rapid increase in commercial soya plantations, ranching and farming, all of which represent major changes in land use and in how water resources are used and managed. This is a serious issue and impacts on freshwater habitat due to deforestation and soil erosion are already evident.

Conservation Work

The existing conservation work on river dolphins consists of local or regional initiatives, the scope and consistency of which vary depending on the flow of funds. Population abundance and trends are relatively well known for Asian river dolphins, whereas because of the vast extent of habitat and comparatively large overall numbers of animals, less is known about the South American species. Common approaches across regions are needed to support and improve legal and regulatory processes, compliance and enforcement, alternative livelihoods for communities, awareness raising and research.

Most of the range countries have government-approved river dolphin management plans, which typically include habitat monitoring, threat impact assessment, special measures to protect dolphins in designated wetland protected areas, awareness raising, education, alternative livelihoods for communities, and bycatch reduction. Establishment of protected areas specifically for river dolphins is in its infancy but has had some success. In China, the development of semi-natural reserves and translocation of animals into them has been pursued as a way of conserving a viable population of Yangtze finless porpoises. In Colombia, economic valuations of river dolphins have been carried out and communities have benefited from conserving dolphins through nature-oriented tourism and related activities. However, the scope of this effort is limited.

Existing Protected Areas

Protected areas where human activities are managed are critical for protecting dolphins and their prey. Globally, there are 60 protected areas where river dolphins are found – 22 in Asia and 38 in South America (Annex 3). None of these are in Nepal or Indonesia, although notification of one area in central Kutai (Mahakam River,

Indonesia) is expected in the near future. Some protected areas overlap with Ramsar Sites, which is an advantage in raising the area's profile and applying the rigorous monitoring tools that are prescribed by the Ramsar Convention.
Except for a handful of them, all of the existing protected areas allow fishing under the legal framework of associated fishery laws and regulations. The few that do not allow fishing face the challenge of poor enforcement, consequently illegal fishing and dolphin mortality in gear (usually gillnets) is inevitable even when legal protection is in place. This highlights the importance of creating strictly managed core areas within protected areas to reduce human-caused mortality of dolphins. By and large, data on bycatch are far from adequate and there is no systematic monitoring of dolphin mortality in most of the rivers.

Opportunities

The WWF freshwater dolphins and porpoise strategy (hereafter "river dolphin" strategy) is ambitious and aspires to reverse the overwhelmingly negative trend for most populations. The support of partners and public sector organizations will be needed for the strategy to be successfully implemented and have broad impact. Various platforms and a global policy framework already exist to support the conservation of river cetaceans. These need to be more closely aligned to create greater political momentum, which would lead to more effective and sustained action globally. Under current policies to conserve all cetaceans, river dolphins do not receive as much attention as their marine relatives. To be successful, efforts to conserve them and associated freshwater ecosystems will require a collaborative process and more integration at a global scale within the policy framework.

Populations of freshwater cetaceans are protected under national laws throughout their distribution range. Various conventions and global platforms provide instruments that are binding on governments to support freshwater cetacean conservation. For example, the Convention on Migratory Species of Wild Animals (CMS) has called for a global river dolphin Concerted Action. By November 2018, the Minamata Convention on Mercury has been signed by 128 countries. This convention seeks to eradicate or control the use of mercury in production and processing, ban new mercury exploration, and control emissions into soil, water and air by engaging with businesses. If properly implemented, the Minamata Convention would help make rivers healthier for cetaceans and many other species, as well as people.

The Convention on Biological Diversity (CBD) supports the establishment of protected areas and Aichi target 11 refers to protecting 17 per cent of terrestrial and inland water by 2020. If such protected areas were well managed, they could contribute to the

conservation of a wide array of species. The next CBD Conference of the Parties will be held in China in 2020, and this provides an appropriate forum and a timely opportunity to harness the support of signatory states.
The Ramsar Convention on Wetlands is important for the protection of aquatic biodiversity, water resource management, and livelihoods, and many protected areas inhabited by river dolphins are already Ramsar sites. This creates opportunities to push for better management and to shine an international spotlight on these habitats.

All populations of freshwater cetaceans are listed on Appendix I or II of the Convention on the International Trade of Endangered Species of Wild Fauna and Flora (CITES), which seeks to regulate any international trade to ensure that it does not threaten species listed under the convention, e.g. live-caught dolphins and porpoises for zoos and aquariums. This aspect is also covered under CMS through Resolution 11.22 on Live Captures of Cetaceans for Commercial purposes.

The Sustainable Development Goals (SDGs) adopted by the United Nations in 2015 are intended to 'end poverty', 'protect the planet' and 'ensure prosperity for all'. Such aspirational goals must be interpreted as encompassing the conservation of all biodiversity and resources, including river dolphins and the environmental attributes that need to be maintained for them to flourish. Environmental degradation, freshwater scarcity and loss of biodiversity are important targets of the SDGs. The timelines overlap with the WWF river dolphin strategy, and this presents another opportunity for the river dolphin conservation community to exert pressure on governments to prioritize policies that benefit natural wildlife populations and healthy rivers, while protecting livelihoods. There are 17 goals and 169 targets and many of them can be cited as supporting river dolphin and aquatic ecosystem conservation. There is an opportunity to influence and give more strategic input to foster river dolphin conservation in the voluntary review of SDGs.

The International Whaling Commission (IWC), under the International Convention for the Regulation of Whaling, 1946, recognizes the need for international cooperation to conserve and restore populations of small cetaceans. An important milestone was reached in 2014 when a Resolution was passed establishing terms of reference to consolidate the Scientific Committee's mandate on small cetaceans. In 2016, the IWC also endorsed the first Conservation Management Plan for a small cetacean, the franciscana, and this paves the way for additional endorsements of such plans for other small cetaceans, including river dolphins. A new CMP is currently under discussion for the range states of the Amazon River dolphin (Brazil, Peru, Ecuador and Colombia). In 2016 the IWC Scientific Committee's Sub-committee on Small Cetaceans reviewed the status of freshwater cetaceans in southern Asia and provided recommendations concerning their conservation. In 2017 it did the same for

freshwater cetaceans in South America and in addition, the IWC sponsored a workshop in Brazil specifically to address the deliberate killing of river dolphins in the Amazon and Orinoco rivers. Additionally, the IWC has created a South Asian River Dolphin Task Team and has initiated a Bycatch Mitigation Initiative. It is clear that the IWC can become an effective platform for raising the profile of river dolphins globally and for providing technical as well as political support for this strategy.

Regional conservation efforts and intergovernmental coordination platforms can help build political momentum. For example, the Mekong River Commission, the South Asian Association for Regional Cooperation, and the Union of South American Nations can be used to lobby governments and push for prioritizing river dolphin conservation and for allocating government funds for improved law enforcement and other actions. The Organización del Tratado de Cooperación Amazónica – an 8-member body meant to ensure sustainable development and improved livelihoods of people in the Amazon region – is another potentially useful platform to support river dolphin conservation. An initiative to establish a South American River Dolphin Protected Area Network was launched several years ago by Whale and Dolphin Conservation, a UK-based NGO. This initiative supports local partners to identify and map existing, proposed and potential protected areas for river dolphins in South America.

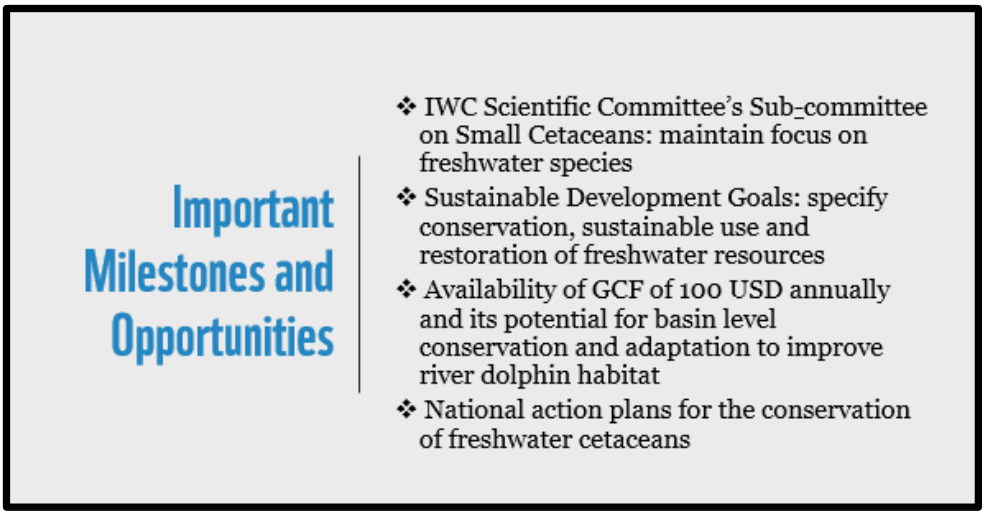
The World Heritage Convention and its World Heritage Center, which is administered by UNESCO, provides another global platform with the potential to be used to enhance the profile of river dolphin habitats and the human cultures and communities associated with both the animals and the habitat they depend on.

WWF has a Cetacean Species Action Plan (2012-2020), which covers both marine and freshwater species, and action plans and management plans aimed at river dolphin conservation exist in some range countries. These plans have often been approved by the relevant governments and are already part of the regulatory framework. This gives WWF an opportunity to strengthen ongoing and planned work. Shortages of capacity and funding often hinder implementation of international commitments and national action plans and that is an area where WWF and its partners can step up.

There is a 2012–2020 Action Plan for South American River Dolphins and as it is approaching its conclusion, most of the river dolphin range countries in South America have their own government-endorsed conservation and/or management plans, as do most range states in Asia. A Yangtze Finless Porpoise Saving Action Plan (2016-2025) was launched in China in 2016. A Management Plan for the Ayeyarwady Dolphin Protected Area was prepared by the Myanmar Department of Fisheries in collaboration with WCS. In India, a National River Dolphin Action Plan (2010-2020) was developed by WWF-India in collaboration with the National Mission for Clean Ganga and the

Ministry of Environment, Forests & Climate Change. The Ganga Aquatic Biodiversity Conservation Strategy (2018) is also under preparation. In Indonesia, an action and management plan at the district level is expected to be adopted soon at the national level. Under this plan, a 48,000 ha Protected Area would be designated that includes core dolphin habitat on the Mahakam mainstem, key tributaries and a lake, as well as associated freshwater and peat swamps.

Economic development and 'green' investment guidance in relation to dams and infrastructure presents another opportunity. WWF seeks to exert influence at a global level, as well as in each of the relevant river basins. For example, WWF is working on a global initiative to influence planning under China's Belt and Road Initiative. WWF also aims to influence other Chinese external investments in hydropower, as well as investments by any company or financial institution in projects that are shown to threaten river dolphins. It is critical that such threats are clearly identified and characterized so that consideration of the needs of river dolphins are integrated into the investment decisions and so that projects are implemented with minimal impact on these animals as an explicit objective.



WWF offices cover most of the dolphin range countries and provide the WWF Network with a unique opportunity to pursue implementation of the global river dolphin strategy in an organized, coordinated and concrete manner. The strategy includes three broad priorities, each of which has a specific set of interventions;

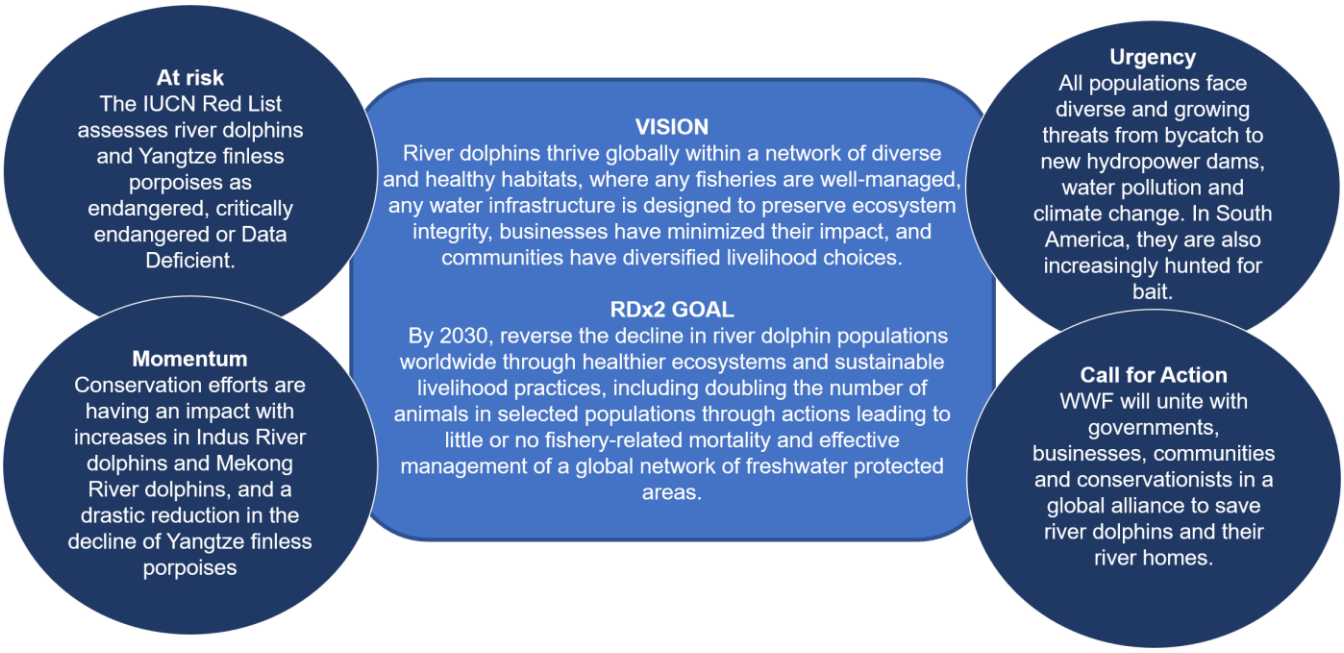
1. Improving freshwater protected area management with careful and strategic fishery policy reforms.
2. Establishing additional protected areas, while influencing dolphin-safe investment into water infrastructure.

3. Building political momentum with governments taking the lead (Multilateral Environmental Agreement, improved legislation).

River Dolphins Times Two (RDx2)

The *River Dolphins Times Two (RDx2)* initiative is a visionary conservation goal that WWF will seek to achieve by forming a global alliance with many key partner organizations from both the private and public sectors. This will include government agencies, local communities, NGOs, and businesses to inculcate shared ownership of river dolphins, freshwater habitat and shared freshwater resources. WWF can steer the process of bringing the dolphin range countries and partners together to build political momentum. We are already seeing positive results of the work that WWF has been leading across several of the dolphin range states and the potential exists to deliver ambitious targets. This river dolphin strategy will focus on 13 range countries globally; six in South America – Bolivia, Brazil, Colombia, Ecuador, Peru and Venezuela – and seven in Asia – Cambodia, China, India, Indonesia, Myanmar, Nepal and Pakistan.

It is a living document, which will be adapted to deal with changing challenges and situations. Communications, fundraising and advocacy activities will support the strategy, which will integrate capacity building and awareness raising with communities, government agencies and high-level policy institutions.



Outcome 1 – Well-managed network of Freshwater Protected Areas[2] established
By 2030, river dolphin populations are secured in a network of well-managed protected areas with trained and reliably paid field staff. The protection provided will benefit the overall ecosystem and biodiversity generally, but with cetaceans as a prioritized beneficiary.

Outcome 2 – Fishery policy reformed
By 2030, fishery policies are reformed in the basins that contain river dolphins and sustainable fisheries are ensured with minimal impacts on cetaceans through country-specific policy changes.

Outcome 3 – Habitat integrity preserved
By 2030, priority rivers, lakes and river sections are secured as free-flowing and given a high level of protection. Communities, businesses and governments recognize the social, economic and ecological value of such freshwater systems, while influencing basin-scale planning in ways that preserve ecosystem integrity.

Outcome 4 – Communities, governments and businesses become custodians of the river dolphins
By 2030, communities, governments and businesses have a sense of ownership of the river dolphins and their habitat. Livelihoods of communities are diversified to provide alternatives to fishing, governments allocate more resources to river dolphin conservation and play a lead role in promoting it, and businesses transform their practices to be environmentally sustainable.

These outcomes will be achieved over three strategic phases, with monitoring and evaluation for each phase.

Phase 1 – *Build the evidence and stop the decline* (2018–2022)

This will be a multifaceted implementation phase, with interventions comprising high-level policy initiatives and field-level protected area designation and management. Area-based protection of freshwater habitats has been inefficient, ineffective and poorly managed compared to the protection of some terrestrial landscapes and this is what WWF and its partners will seek to change. This phase relies more on conventional conservation approaches, such as improving protected area management, enhancing community-based protection and building staff capacity. Urgent high-level policy interventions to protect already-identified core habitat from upcoming water infrastructure projects will be needed for dolphin populations to recover.

[2] This includes those PAs that are predominantly terrestrial in focus but have within them freshwater ecosystems inhabited by river dolphins, as is the case with some PAs in South America and India.

Objective 1 – Influence governments to sign Multilateral Environmental Agreements and form partnerships to reach the conservation goal

Activity 1.1
Launch a communications campaign to enhance awareness about river dolphins and their significance for the conservation of freshwater ecosystems. It will inspire interest and engagement among the general public and influence governments by highlighting the urgency of the situation. Opportunities related to conservation and research work will be utilised to develop compelling stories. Content and messaging will be developed for all relevant media channels along with a concerted communications campaign.

Activity 1.2
Organise an intergovernmental summit in October 2019 in China to harness the support of range states that are CBD signatories and encourage them to augment their conservation efforts by signing a Heads of State declaration by 2021.

Activity 1.3
Engage with governments and partners to put forward a resolution to the IWC as one way of expanding and enhancing government engagement. Seek similar resolutions or statements by other multilateral or international bodies.

Activity 1.4
Submit a brief to CMS for listing the freshwater dolphins as 'Concerted Action Species'

Activity 1.5
Advocate through the Minamata Convention and launch a campaign around 'Healthy Rivers, Healthy People' – initially focused on the Amazon – to end the use of mercury in artisanal and small-scale gold mining and reduce mercury releases by industries into aquatic ecosystems (whether directly or indirectly). This campaign will be backed by research using tissue samples from freshwater cetaceans, other aquatic organisms and water, with mapping of cetacean ranges together with areas known to have high contaminant levels. The campaign will include engagement with industries that contribute to the mercury in relevant ecosystems.

Objective 2 – Improve the management of freshwater protected areas for conservation of river dolphins.

Activity 2.1
Review national dolphin action plans in all range countries and strengthen their implementation with financial allocations to protect habitat integrity.

Activity 2.2
Assess population characteristics, threats and community livelihoods in areas inhabited by river dolphins, identify critical habitat, and employ spatial planning to protect this habitat. Field surveys are needed for baseline estimates of abundance in areas where river dolphins are known to exist (or to have existed in recent times) but

abundance estimates are lacking. Once baseline estimates are available, follow-up surveys are needed to (a) track trends in abundance over time, (b) identify new or emerging conservation problems as they arise, (c) determine whether conservation and management efforts are effective, (d) assess lost or fragmented habitat, and (e) obtain information on habitats that should be given special protection.

Activity 2.3

Protect the integrity of habitat that has been identified as critical to the survival and recovery of a particular river dolphin population or species. For example, this activity must include strong action to prevent construction of Sambor and Stung Treng dams on the Mekong River as these dams have the potential to cause the extirpation of the dolphin population. Similar advocacy work is needed in other basins, e.g. the Amazon, where river dolphins are at serious risk. Global attention must be drawn, with increasing force and conviction, to the threats to freshwater systems that support cetaceans. Strong efforts must be made to influence new infrastructure planning and infrastructure 'improvement' projects that could affect river dolphin habitat.

Activity 2.4

Map all dams (including medium and small-scale dams) and other infrastructure projects (including navigation, hydropower, irrigation, flood control etc.) planned in the basins inhabited by river dolphins, and identify the relevant financial institutions. WWF will lead the production of a report on the impacts of infrastructure projects on river dolphins, with case studies highlighting the economic benefits of free-flowing rivers, especially considering the challenges of climate change.

Activity 2.5

Improve management of freshwater protected areas through effective law enforcement and patrolling, provision of incentives to increase voluntary compliance, and enhancement of conservation partnerships. Develop 'Conservation Assured' (CA) protected area standards specific to river dolphins as 'Conservation Assured | River Dolphins Standards – CA | RDS'. Use SMART tools to monitor patrols and law enforcement in the PAs and conduct CA | RDS assessments of at least half the existing PAs. CA is a new conservation management tool to enhance the effectiveness of protected areas for a specific focal species, which has been successfully applied for the conservation of tigers. Work is currently underway to develop similar species-specific standards for rhinoceroses and snow leopards. CA meets the requirements set forth in international agreements such as the CBD. This activity will involve two regional trainings for wardens, 'river guards' and others on the frontline of river dolphin conservation. A CA | RDS manual will be developed in different languages. This will also include use of the Ramsar-adopted Management Effectiveness Tracking Tool to improve the management and effectiveness of those PAs that are also Ramsar sites.

Activity 2.6

Map all major polluting industries in river dolphin habitats and integrate them into databases, such as WWF's Water Risk Filter[3], to enhance transparency and use it as baseline to show a gradual transformation of business practices in later phases.

Objective 3 – Conduct a thorough review of fishery policies and laws and propose changes needed to reduce the impact of fishing on river dolphins

Activity 3.1

Conduct a carefully targeted review of fishery policies and laws in river dolphin range states, with recommendations for specific changes needed to reduce the impacts of fishing on the cetacean populations. This activity will address a major, longstanding threat to all river dolphins: fishery bycatch. It will cover all bycatch of cetaceans, direct hunting of cetaceans for bait, retaliatory actions by fishers against cetaceans as competitors, use of harmful fishing gear, market demands and ecological interactions leading to reduced prey for cetaceans. This activity cannot be a 'high-level' review that would be easy for authorities and communities to ignore. It must be strategic, carefully targeted, and practical. It will lead to national actions to integrate the reforms.

Activity 3.2

Apply 'Conservation Assured | River Dolphins Standards' (CA | RDS) in at least half of the freshwater protected areas to achieve zero fishing-related deaths of river dolphins.

Phase 2 – *Secure habitat for more river dolphins* (2022–2026)

This phase will focus on awareness raising, research and demonstrating how keeping rivers free-flowing for sediments, fish, dolphins and other biota is economically beneficial. It will also help in establishing more freshwater 'Key Biodiversity Areas' to help countries introduce conservation measures for businesses. Economic development and 'green' investment guidance, particularly in relation to dams and other infrastructure, present opportunities. WWF seeks to have influence at a global level, as well as in each of the relevant freshwater basins, e.g. concerning dams in the Andean region that will affect the entire Amazon basin and those in the upper Himalayan region that will affect rivers downstream.

Objective 1 – Establish a network of well-managed freshwater protected areas and ensure that rivers or river sections critical to the survival and recovery of freshwater cetaceans are maintained as free-flowing

Activity 1.1

Secure river dolphin habitats identified in Phase 1 as legally notified freshwater protected areas or 'other effective area-based conservation measure'[4] to double the area under conservation.

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[3] Water Risk Filter is WWF initiative used to assess water related risk for the operations

[4] Defined in CBD COP 14 as a geographically defined areas other than a PA, which is governed and managed in ways that achieve positive and sustained long-term outcomes for the *in situ* conservation of biodiversity, with associated

The mapping of potential river dolphin protected areas in Phase 1 will also consider Indigenous lands. In phase 2 we will reach out to indigenous communities and work with them to establish community managed conservation areas to enhance protection of dolphins, particularly relevant to South America.

Activity 1.2
Apply CA|RDS tools to all freshwater protected areas inhabited by cetaceans and achieve zero mortality from fishing activities within these protected areas.

Activity 1.3
Identify inland water 'Key Biodiversity Areas' and consolidate site proposals for scientific review leading to official site nomination.

Objective 2 – Influence the decision-making of financial institutions that invest in and, in effect, govern water infrastructure development.

Activity 2.1
Use the baseline and follow-up data that were collected and analyzed (and mapped) in Phase 1 to lobby financial institutions and promote sustainable (i.e. environmentally benign or beneficial) investments in freshwater basins inhabited by river dolphins.

Activity 2.2
Develop cross linkage with 'Bankable Water Solutions to secure finances to support projects that will help provide alternate livelihoods and conserve key habitats, while securing habitat connectivity.

Activity 2.3
Ensure that China's Belt and Road Initiative (BRI) as well as hydropower and water infrastructure projects do not have significant impacts on river dolphin habitat. Investments by the Chinese government and by Chinese banks and companies in hydropower dams and other types of projects with potential impacts on river dolphins need to be guided by clear and authoritative information on such impacts. This information must be integrated into investment planning and project design with the goal of lowering and eventually eliminating further risks to these endangered animals.

Activity 2.4
Monitor any projects that involve modifications to existing infrastructure to ensure that these 'improvements' do not have negative impacts on river dolphin habitat.

Activity 2.5
Become involved in the periodic review by river dolphin range countries of efforts to meet the SDGs, CBD targets, and Intended Nationally Determined Contributions

ecosystem functions and services and where applicable, cultural, spiritual and socio-economic values and other locally relevant values'

under the 2015 Paris Agreement on Climate Change, and seek support for the prioritization of river dolphin conservation.

Objective 3 – Diversify livelihoods in communities that share habitat with river dolphins with the goal of reducing impacts and securing a shared future for those communities and the dolphins

Activity 3.1
Engage with development organizations and aid agencies (e.g. USAID, AusAID, UNDP, GPAF etc.) and convince them to support livelihoods initiatives for communities that share habitat with river dolphins, with the goal of reducing fishing pressure and the many stresses on riparian habitat. WWF will reach out to other organisations and seek their support to leverage community development initiatives that complement and enhance freshwater cetacean conservation as part of the WWF Network's strategy. This will also help in developing alternative livelihoods focusing on ecotourism, cottage industries and small- and medium-scale enterprises. Constant consideration must be given to discouraging and avoiding livelihoods that, regardless of the intent, could end up making the situation for river dolphins and their habitat worse rather than better.

Activity 3.2
Establish fishing agreements with communities and businesses that are engaged in the sale and distribution of fishery products to regulate market demand for fish and fishing through community participation and sustainable business practices. This will be particularly relevant where dolphin habitats are also Ramsar sites.

Activity 3.3
Promote aquaculture with native species and develop aquaculture standards that support river dolphin conservation and ensure that these are aligned with or integrated into the existing standards of the Aquaculture Stewardship Council. Establish pilot projects for ASC certification so communities can see the benefits.

Activity 3.4
Improve agricultural practices to reduce the impact from the extensive use of pesticides and fertilizers. This activity will include engagement with farmers to promote more environmentally aware and considerate use of agrochemicals and demonstrate to growers the economic benefits of eliminating or significantly curtailing the use of such chemicals. It will also be linked to businesses so that buyers of agricultural produce and raw materials give preference to sustainably produced products as part of their social, environmental, and 'business sustainability' initiatives. The activity will be carried out in close coordination with other WWF practices that deal with markets and food.

Phase 3 – *Safe long-term future* (2026–2030)

This phase is intended to see the implementation of improved fishery management and basin-scale spatial planning. It will require high-level commitments by range state

governments to take the lead in river dolphin conservation in terms of how they allocate resources and safeguard the animals and the habitat.

Objective 1 – Implement legislative and regulatory measures and transform businesses in basins with river dolphins

Activity 1.1
Improve fishery management through changes in law, regulation and policy to support river dolphin conservation. The review of fishery policies and laws conducted in Phase 1 will lay the foundation to make changes in regard to *inter alia* over-fishing, poorly managed fishing and the use of fishing gear that threatens river dolphins (e.g. gillnets).

Activity 1.2
Maintain, through legal notification by the respective governments, critical rivers and sections of rivers as free-flowing systems that are capable of serving their natural functions and therefore support biodiversity. The important rivers and sections of rivers, identified through the population assessment surveys in Phase 1, will be given legal protection status to ensure the integrity of those habitats is protected and maintained, and not threatened by infrastructure development. It will also include development of management plans for those rivers and river sections. This will also integrate the provision of legal status to KBA in national legislations.

Activity 1.3
Transform businesses by improving their environmental and social performance and updating the database developed in Phase 1. Businesses operating in or near river dolphin habitat, or that in some way affect such habitat regardless of location, must transform their practices to conform with national legal requirements and improve their transparency by following the Global Reporting Initiative's (GRI) sustainable reporting standards. WWF will liaise with regional GRI hubs to support the process.

Objective 2 – Advocate for the implementation of Multilateral Environmental Agreements (MEAs) and proven commitments by governments to work towards conserving river dolphins

Activity 2.1
Encourage river dolphin range countries to ratify and implement MEAs through a legislative framework that supports river dolphin conservation.

Activity 2.2
Ensure governments allocate major resources, increase the number of field agents enforcing river dolphin protection measures and, in general, lead conservation initiatives, while partners play a supporting role.

Activity 2.3
Develop Green Climate Fund programmes for at least five basins.

A Global Alliance

The WWF network has a unique opportunity to influence river dolphin conservation because of its presence in most of the range countries and its existing long-term engagement and leadership in those countries on these species. The WWF network can continue to lead and scale-up river dolphin conservation efforts in a deliberate, coordinated manner, while paving the way for the involvement of various other organisations, governments, businesses and communities in the 13 range countries in Asia and South America.

Besides relevant governments, WWF already works with partners to deliver its conservation targets for river dolphins, such as the Chinese Academy of Sciences (China), Omacha Foundation (Colombia), and Mamirauá Institute (Brazil). Given the ambitious objectives and the need for global coordination, WWF will collaborate with a global alliance of partners with a broad range of expertise and knowledge. This alliance will act as a global force to influence the public and decision-makers to take the steps necessary to ensure the success of '*River Dolphins Times Two*'.

Among the partners that are expected to collaborate in this endeavor are the following:

The **IUCN Species Survival Commission's Cetacean Specialist Group**, consisting of around 120 individual members, is an independent, influential scientific voice. Its most recent Action Plan (published in 2003) continues to be a useful reference for identifying cetacean conservation issues and finding management guidance. In the past, the Cetacean Specialist Group established an Asian Freshwater Dolphin Committee, which could be revived to assist in regional coordination, and a similar platform could be formed in South America.

Whale and Dolphin Conservation (WDC), has helped formulate and implement numerous agreements under the Convention on Migratory Species of Wild Animals (CMS) and has also funded work on river dolphins internationally. WDC will be an effective partner in helping to mobilize CMS and developing proposals for river dolphins as Concerted Action Species under CMS.

The **Marine Mammal Commission (MMC)** is an independent USA government agency with a mission to further the conservation of marine mammals and their habitat. This is a very influential forum that can provide policy support to international issues concerning river dolphins.

The Society for Marine Mammalogy (SMM) can play a leadership and supportive role with its 2000+ members in 25 countries. The Society provides financial support for research and is setting up a critically endangered species fund, which could be useful to help fill some of the information gaps concerning river dolphin conservation and management.

The **Wildlife Conservation Society (WCS)** has led research and conservation initiatives for river dolphins in some countries in Asia, especially in Bangladesh where WWF does not have a programme. WWF has been working with WCS and will remain partners for the implementation of this strategy in specific areas.

Development and government aid institutions (**DFID/GPAF, UNDP, AusAid, USAID** etc.) can support the *RDx2* strategy by providing aid to communities that are dependent on the same habitat as river dolphins. This support can focus on diversification of livelihoods and providing alternatives to fishing that do not have any adverse impacts on river dolphins or their habitat. Freshwater cetacean conservation and protection of livelihoods of millions of people who share habitat with these animals fits within the GCF and UNDP/GEF priorities, particularly with regard to vulnerability to climate change.

The **Aquaculture Stewardship Council** is another important partner that can promote environmentally responsible aquaculture and provide communities with more livelihood options.

Annex 1

Asian River Dolphin and porpoises – species/subspecies data

Species/ subspecies	Irrawaddy Mekong	Irrawaddy Mahakam	Irrawaddy Irrawaddy	Ganges dolphin, India	Ganges dolphin Nepal	Ganges dolphin, Bangladesh
Scientific name	*Orcaella brevirostris*	*Orcaella brevirostris*	*Orcaella brevirostris*	*Platanista gangetica gangetica*	*Platanista gangetica gangetica*	*Platanista gangetica gangetica*
Subpopulation range	Cambodia and Laos	Indonesia	Myanmar	Ganges river	Ganges tributaries	Brahmaputra and Karnaphuli rivers
River stretch	190 km	420 km	400 km	Ganges and its tributaries (across 3 states), Brahmaputra	Western: Karnali, Mohana (43 dolphins), Sapta Kohsi (9 dolphins)	Karnaphuli, Sangu, Meghna, and numerous other major and small rivers
Sub-population numbers (year)	92 (80-106) and only 3 left in Laos (2017)	80 (2014), 76 (2017)	69 (2017), 76 (2018)	3500 - 4000 (no precise survey), 2015 survey in Uttar Pradesh counted 1272	28 (Paudel *et al.* 2017, 2015)	225 (Sundarbans) 125 (Karnaphuli and Sangu), 197 (Brahmaputra)
Previous assessments	80 (2015) 85 (2010)	Biannual surveys done by RASI[5]		No country wide survey, data from different states	37-42 (Paudel *et al* 2015)	
IUCN Red List status	Critically endangered	Critically endangered	Critically endangered	Endangered	Endangered	Endangered
CMS	Appendix I, II	Appendix I, II	Appendix I, II	Appendix I, II	Appendix I, II	Appendix I, II

[5] Yayasan Konservasi Rasi

Species/ subspecies	Indus dolphin Pakistan	Indus dolphin India	Finless Porpoise China
Scientific name	*Platanista gangetica minor*	*Platanista gangetica minor*	*Neophocaena asiaeorientalis asiaeorientalis*
Subpopulation range	Indus river	Beas river	Yangtze river
River stretch (name and length or area)	Indus (Chashma - Kotri Barrage, about 1000 km)	185 km	Middle and lower mainstem of Yangtze and two adjacent lakes – Dongting and Poyang
Sub-population numbers (year)	1987 (2017)	5-11 (2018)[6]	1012 (total in 2017-18) – 445 in the mainstem of Yangtze, the rest in Dongting and Poyang lakes; 100 in semi-natural reserves
Previous assessments	2001 (1200), 2006 (1600-1750), 2011 (1452)		1045 (2012)
IUCN Red List status	Endangered	Endangered	Critically endangered
CMS	Not listed	Not listed	Appendix II

Asian River dolphin population	Population size (year of estimate)					
Mekong		93 (2007)			80 (2015)	92 (2017)
Mahakam	88(2005)	84 (2007)	80 (2010)	80(2012)	80 (2014)	76 (2017)
Ayeyarwady	59(2003)		68 (2014)	65 (2016)	70 (2017)	76 (2018)
Yangtze Finless Porpoise	2700 (1993)		2000 (1999)	1800 (2008)	1045 (2012)	1012 (2017)
Yangtze River dolphin (Baiji)	400 (1982)	100 (1990)	13 (1997)	Last record (2002)	0 (2006)	
Indus River	1200 (2001)			1600 - 1750 (2006)	1452(2011)	1987 (2017)

Annex 2

South American River Dolphin poises – species/subspecies data[7]

[6] https://www.wwfindia.org/?17361/Indus-River-Dolphin-Survey
[7] Data on numbers from Omacha Foundation, 2005 – 2015 Report, Initiatives for research, management and conservation of river dolphins in South America and Asia

Species/ subspecies	Common Boto	Bolivian Bufeo	Common Boto Orinoco	Common Boto Parts of Brazil	Tucuxi
Scientific name	*Inia geoffrensis geoffrensis*	*I. g. boliviensis*	*I. g. geoffrensis*	*I. g. geoffrensis*	*Sotalia fluviatilis*
Subpopulation range	Brazil, Colombia, Peru and Ecuador	Bolivia and Brazil	Venezuela and Colombia	Brazil	Brazil, Peru, Ecuador, Colombia
River stretch (name and length or area)	Amazon Basin	Madeira Basin	Orinoco Basin	Araguaia-Tocantins basin	Amazon
Sub-population numbers[8] (year)	5,616	5,093	3,689	363	5,144
Population IUCN status	Endangered (2018)	Not assessed separately	Not assessed separately	Not assessed separately	Data deficient (2012)
CMS	Appendix II[9]	Appendix II	Appendix II	Appendix II	Appendix II

Annex 3

Wetland Protected Areas with river dolphins

	Country	Species	Name of the Protected Area	Size (sq km or km if a river stretch)	Approximate population within the PA	Ramsar site	Fishing allowed
1	China	Yangtze Finless Porpoise	Hubei Yangtze Tian-e-zhou Baiji National Reserve (in situ and translocation)	110 sq km, 90 sq km with 89km in Yangtze stem and 2000 ha with 20.9km in the oxbow	About 80 in oxbow	No	No
2			Hubei Jianli He wang miao Provincial Yangtze finless porpoise Reserve (ex situ)	47 sq km, 32km in oxbow (with central line of river as the boundary, Hubei and Hunan share common management)	15-17	No	No
3			Hunan Huarong Ji-cheng Provincial Yangtze finless porpoise reserve Reserve(ex situ)				No
4			Hunan Dongting Lake Municipal Yangtze finless porpoise reserve	About 300 sq km in dry and floodwater seasons of East Dongting lake	About 110	Yes	No
5			Hubei Yangtze Xinluo Section Baiji National Reserve	17800 ha, 135.5km in stem		No	No

[8] These numbers do not represent the entire range but populations in selected rivers/sections. The actual population size is a lot more.
[9] CMS mentions *Inia geoffrensis* as a species and does not list sub species

	Country	Species	Name of the Protected Area	Size (sq km or km if a river stretch)	Approximate population within the PA	Ramsar site	Fishing allowed
6			Jiangxi Poyang Lake Yangtze finless porpoise Provincial reserve	68 km²	457	Yes, partial area	No
7			Anhui Anqing Yangtze finless porpoise Municipal Reserve	About 300 km², 243km in stem	About 15 porpoises in the Xijiang translocation site	No	No
8			Anhui Tongling Yangtze freshwater dolphin National Reserve	315 km², 58km in mainstem and a semi translocation site with 2 km length, 0.4 sq km		No	
9			Jiangsu Nanjing Yangtze finless porpoise Provincial Nature Reserve	87 sq km	semi-translocation site, 10 porpoise	No	
10			Jiangsu Zhenjiang Yangtze dolphins	5730 ha		No	
11			The Mekong Dolphin Protection and Management Area	776.36 km2	92	No	Yes
12	**Cambodia**	**Irrawaddy**	Mekong Fishery Biodiversity Management and Conservation Zone	372.7 km²		No	Yes
13			Steung Treng Ramsar Site	148.9 km²	Range but haven't used this stretch since 2005	Yes	Yes
14	**Myanmar**	Irrawaddy dolphin	Ayeyarwady Dolphin Protected Area	74 km with additional 100 km as buffer zone	1/3	No	Yes
15	**Pakistan**	Indus dolphin	Indus dolphin reserve	190 km	1075	Yes	Yes
16			Taunsa Wildlife Sanctuary	7000 ha	2-7	Yes	No
17	**India**	**Indus dolphin**	Beas Conservation Reserve, Punjab	185 km	3-6		No
18			Harike Wildlife Sanctuary, Punjab	84 sq km		Yes	Yes
19		**Ganges River dolphin**	Narora Ramsar Site, Uttar Pradesh	85 km		Yes	Yes
			Ganga River Bijnore to Narora barrage	225 sq km	22		
20			National Chambal Sanctuary (tri state)	5400 sq km	116, only 356 km surveyed in Uttar Pradesh state		No

	Country	Species	Name of the Protected Area	Size (sq km or km if a river stretch)	Approximate population within the PA	Ramsar site	Fishing allowed
21			Katerniaghat Wildlife Sanctuary, Uttar Pradesh	400.6 sq km	45, only 36 km stretch surveyed		No
22			Vikramshila Gangetic Dolphin Sanctuary Bihar	50km			No
23		*Inia* spp	Mamiraua Sustainable Development Reserve	11, 137 km²		Yes	Yes
24			Amanã Sustainable Development Reserve (AM)	23,500 km²		No	Yes
25			Piagaçu-Purus Sustainable Development Reserve	10, 082 km²		No	Yes
26			Jau National Park	23,673 km²		No	No
27			Juruena National Park	19,582 km²		No	No
28			Viruá National Park	2,4195 km²		Yes	No
29			Anavihanas National Park	3,505 km²		No	No
30	**Brazil**		Lago Piratuba Biological Reserve	3,925 km²		No	Yes
31			Medio Juruá Extractive Reserve	2,516 km²		No	Yes
32			Cabo Orange National Park	6,190 km²		Yes	No
33			Serra do Divisor National park	8,376 km²		No	No
34			Bararati Sustainable Development Reserve	1,136 km²		No	Yes
35			Sucunduri State park	7,960 km²		No	Yes
36			Alto Juruá Extractive Reserve	5,379 km²		No	Yes
37			Araguaia National Park	5,555 km²		Yes	No
38			Cantão State Park	900 km²		No	No
39	**Ecuador**	*Inia* and Tucuxi	Cuyabeno-Wildlife Reserve	603,380 ha		Yes, partially	Subsistence fishing
40			Yasuni National Park	1,022,736 ha		Yes, partially	As above
41	**Peru**	*Inia* and tucuxi	Pacaya samiria national Park	208,000 sq km	441 (*Inia*) and 377 *Sotalia*	No	No

	Country	Species	Name of the Protected Area	Size (sq km or km if a river stretch)	Approximate population within the PA	Ramsar site	Fishing allowed
42		*Inia* and tucuxi	Pucacuro national reserve	6379.54 sq km		No	No
43		*Inia* and tucuxi	Güeppi-Sekime national Park	2,036 sq km		No	No
44		*Inia* and tucuxi	Communal Reserve Airo Pai	24,788 sq km		No	Yes
45		*Inia* and tucuxi	Communal Reserve Huimeki	141 234,46 ha.		No	Yes
46		*Inia* and tucuxi	Sierra del Divisor National Park	1 354,485.10 ha		No	No
47		*Inia*	Alto Purús National Park	2 510 694,41 ha		No	No
48		*Inia*	Alpahuayo Mishana National Reserve	58 069.9 ha		No	No
49			Llanos de Moxos	6.900.000 ha	No data	Yes	
50			Parque Departamental y Área Natural de Manejo Integrado Iténez	1,389,025	Not data	Yes , overlaps with one	Yes
51			Parque Nacional Noel Kempff Mercado	1,523,446 ha	No data	No	No
52			Reserva de la Biósfera Estación Biológica del Beni	135,000 ha	No data	Yes, overlaps with one	Yes, only indigenous people
53	**Bolivia**	***Inia***	Territorio Indígena y Parque Nacional Isiboro Sécure	1,236,296 ha	No data	No	Yes, indigenous people and tourism fishing
54			Refugio de Vida Silvestre Estancias Elsner Espíritu	1,200,000 ha	No data	No	No
55			Reserva de Vida Silvestre Rios Blanco y Negro	1,423,871 ha	No data	No	Yes
56			Área Protegida Muicipal Ibare-Mamoré	25,608 ha	No data	No	Yes
57		*Inia* and tucuxi	PNN La Paya	422.000 ha			
58	**Colombia**	*Inia* and tucuxi	Lagos de Tarapoto	44.859 ha			
59		*Inia*	Inirida Fluvial Star	253.000 ha		Yes	Yes
60		*Inia*	Bita River	825.000 ha		Yes	Yes

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