

CA|RDS LITE: A RAPID ASSESSMENT OF SITE MANAGEMENT AGAINST THE CONSERVATION ASSURED | RIVER DOLPHIN STANDARDS

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ABSTRACT

This paper introduces the inaugural rapid evaluation of river dolphin habitats, coinciding with managed sites in Asia and South America. Covering all six river dolphin species (including the sole freshwater porpoise worldwide), each is classified as Endangered or Critically Endangered on the IUCN Red List. The Conservation Assured | River Dolphin Standards (CA|RDS) offer tailored guidelines for the proficient oversight of protected areas for river dolphins. The abbreviated CA|RDS version, termed CA|RDS Lite, involves a questionnaire-based survey conducted by managers and stakeholders at 40 sites across 10 of the 14 countries within the river dolphin range. Both continents face river dolphin endangerment from fishing and climate change. In Asia, risks are more diverse, with smaller populations compared to South America. Insufficient funding and management capacity emerge as significant hurdles. Inadequate collaboration with areas outside the protected area boundary impedes effective river dolphin population management. Encouragingly, the survey highlights active involvement of local communities and stakeholders in site management. CA|RDS Lite offers a quick overview of site management efficacy, pinpointing crucial management requirements and urgent river dolphin sites necessitating intervention. It also sets the stage for the complete application of CA|RDS standards and their use as an accreditation and management instrument.

Key words: IUCN Red List, climate change, management capacity

INTRODUCTION

River dolphins are highly specialised freshwater cetaceans that inhabit some of the world's largest and most iconic rivers. They are among the more threatened mammals on the planet, facing a multitude of threats ranging from habitat loss and degradation to pollution, deliberate and accidental killing and climate change (Braulik et al., 2023). Despite the important role that river dolphins play in freshwater ecosystems, these cetaceans have received relatively little attention compared to terrestrial species (Schipper et al., 2008). Levels of river pollution are particularly severe in parts of Asia (Stokal et al., 2021) and the rise in human populations as well as increased economic activities have fuelled anthropogenic threats. Biodiversity loss and ecosystem collapse are considered to be the one of the greatest global risks to global GDP (The Global Risks Report, 2023).

There are six remaining species of river dolphins found in the world (Figure 1), after the extinction of the Yangtze River Dolphin (Baiji) last seen in 2002 (IUCN Cetacean Specialist Group). These six extant species are found in 14 countries within South America and Asia and are classified as Endangered or Critically Endangered by the IUCN Red List of Threatened Species (Table 1). We use the term 'river dolphins' for all river cetacean species, including the only freshwater porpoise (Yangtze Finless Porpoise), and three riverine subpopulations of the Irrawaddy Dolphin (Ayeyarwady, Mekong and Mahakam rivers).

Protected and conserved areas (PCAs), a term which includes protected areas along with other effective area-based conservation measures (OECMs) (Conservation Assured, 2021) are critical to the survival of threatened species (Rodrigues et al., 2004) and mitigation of the impacts of climate change (Campbell et al., 2018). Currently, there are 119 PCAs that are known to overlap

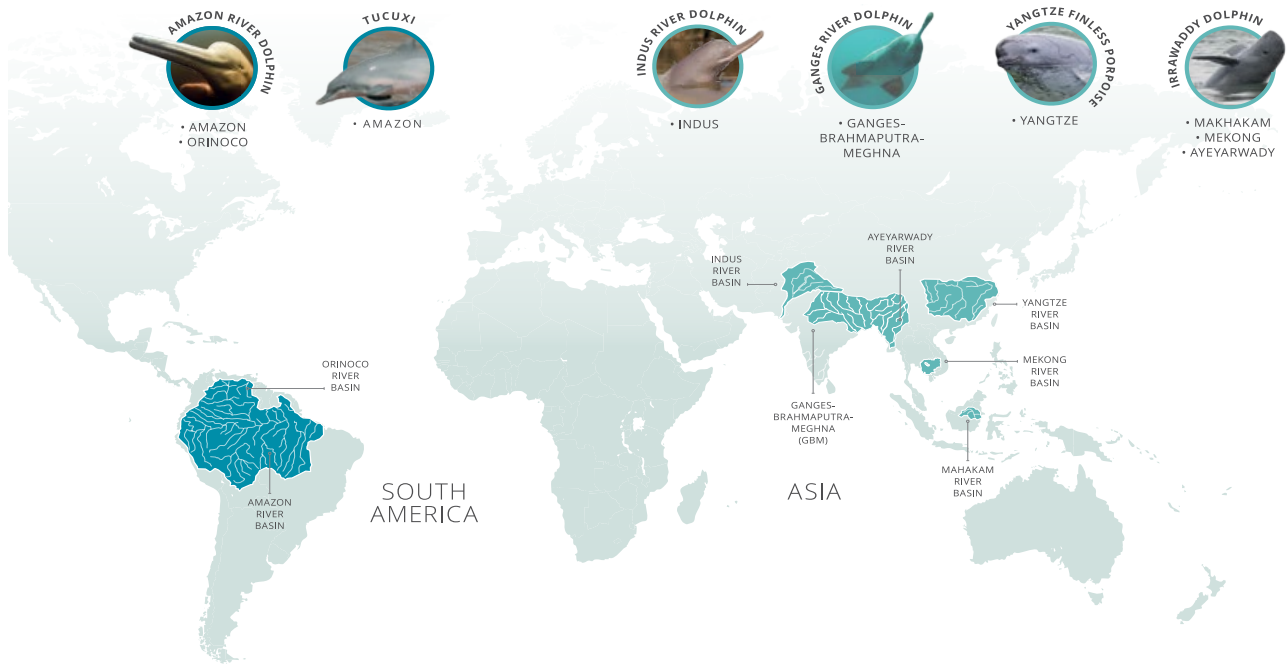


Figure 1. Where river dolphins live: Bangladesh, Bolivia, Brazil, Cambodia, China, Colombia, Ecuador, India, Indonesia, Myanmar, Nepal, Pakistan, Peru and Venezuela. Source: WWF (2023)

river dolphin ranges; 88 in South America and 31 in Asia (Conservation Assured, 2021). In Asia, with the exception of the Ganges River Dolphin, the population abundance of the species is monitored and known, and most of their range is legally protected. In Cambodia, Indonesia and Myanmar, almost the entire Irrawaddy Dolphin’s river ranges are in a protected status; in China around 50 per cent and in Pakistan 70 per cent of the population lives within PCAs. This compares with Bangladesh, India and Nepal where a low percentage of the Ganges River Dolphin’s range is officially designated under protection, and large areas have not been surveyed to assess population abundance (Kelkar et al., 2022). In South America, large areas have not been surveyed to assess population abundance and most river dolphins are believed to live outside legally protected areas (WWF, 2023).

The role of PCAs in maintaining populations of river dolphins is still poorly understood (Mintzer et al., 2020). The current survey therefore aimed to provide a preliminary snapshot of the effectiveness of these areas for river dolphin conservation around the world, as part of an ongoing process to strengthen management of these species, several of which are severely threatened (WWF, 2023).

Conservation Assured and CA|RDS Lite

Conservation Assured is an approach to developing conservation standards tailored to individual species or groups of species. These standards can then be used as the basis for independent assessment, and if desired accreditation, of sites against these standards. Conservation Assured provides a platform that helps to achieve effective site-based conservation through collaborative effort. It comprises a framework which acts as a verifier as well as an indicator of optimal practices. This is done by providing shared standards to site managers to achieve the conservation objectives specific to their sites. It allows for site managers to oversee and gauge their individual efforts to contribute to the collaborative conservation process through independent reviews and auditing procedures (Conservation Assured, 2021). Conservation Assured creates financial incentives for conservation, by giving governments and donors assurance that funds are not being wasted and a clear measure against which to assess progress. This has been demonstrated in the Conservation Assured | Tiger Standards (CA|TS) that have been promulgated within tiger ranges in 128 sites so far (Conservation Assured, 2022).

Conservation Assured | River Dolphin Standards (CA|RDS) is a set of standards for good management of river dolphins in PCAs. It is designed to understand whether river dolphins are being effectively protected and thus strengthens management. CA|RDS was

produced after extensive research and analyses among river dolphin experts around the globe who contributed to the documentation of global best practices to conserve river dolphins (Willems et al., 2021). CA|RDS comprises a total of eight pillars (broad subject areas) to evaluate effective site management (Figure 2).

'CA|RDS Lite' is a questionnaire-based rapid assessment using a simplified and condensed version of CA|RDS. The assessment provides a baseline for management effectiveness of river dolphin conservation and gives insights on how sites can be optimally managed to protect river dolphins. CA|RDS Lite may lead park managers and other stakeholders to apply full CA|RDS standards to their sites, making detailed site-specific management more effective in the future.

METHODOLOGY

The CA|RDS Lite survey was sent to 119 PCAs considered important for river dolphins and completed by park managers. Surveys were carried out at sites either independently or through interviews (in person or virtual) to complete the questionnaires. The survey was completed between June and December 2022. Responses were checked and verified by river dolphin experts from both continents involved; verification involved checking that all questions were completed, checking for any errors and checking data was accurately transferred to the master database. Any changes to data were checked with the data providers.

Around a third (40 sites in total) responded: 16 in Asia and 24 sites in South America. The 40 sites covered all the six species of river dolphins and 10 of the 14 range countries (Bangladesh, Bolivia, Cambodia, China, Colombia, Indonesia, Myanmar, Nepal, Pakistan and Peru – see Tables 1 and 2 for number of sites per country).

It was an agreed protocol that published data from countries would not include site details, but this exercise has created a very detailed database which WWF and partners can use to support river dolphin conservation and track changes in conservation outlook in the future if repeat assessments are carried out.

CA|RDS Lite survey

The survey comprised three sections.

1. A questionnaire based around 39 questions related to management actions identified within the eight CA|RDS pillars (Figure 2). Each question was scored by the respondents on a scale reflecting whether associated management actions were a) fully implemented (score of 1.0), b) in the process of being implemented (score of 0.75), c) planned (score of



Figure 2. The eight pillars of effective site management used in CA|RDS. Source: WWF (2023)

- 0.50), d) recognised as being needed but no action yet taken (score of 0.25), or e) not recognised as being needed (score of 0).
2. A threat assessment where respondents were asked to identify and rank threats (from 0 not a threat to 5 a severe threat) (Table 2 and Figure 3) that their specific river dolphin population(s) were facing: 1) within the site, 2) originating outside the site, and 3) potential future threats; this final category did not specify whether the threat was internal or external to the site. Space was also provided to add to the 21 threats in the list.
3. A set of site attributes including the name, location of site, basic site details, identification of up to two river dolphin species present, and several quantitative and qualitative assessments related to the percentage of national total river dolphin populations protected by the site, population estimates (Table 1), and conservation importance of river dolphins. The full survey is available in Supplementary Online Material.

Data analysis

The survey scores were examined by country, pillar and continent. The scores were totalled for each pillar and percentages were calculated; this gives the average score for each main management issue. A percentage score was given for all the scores together to provide an overall indication of site-level effectiveness. It would have been useful to include analysis per river dolphin species, but in Latin America two species often live in sympatry in the Amazon river system so this was not attempted.

RESULTS

Protection status of sites

Out of the 40 sites included in the survey, it was reported that one site in Nepal and two Ramsar sites in Colombia were not legally protected areas (nor are they recognised OECMs) while all other 37 sites were legally protected areas.

Population abundance

Information on species population and abundance was collected and is presented in Table 1. As noted above, in many sites river dolphin populations are poorly understood so the data presented is broad and in many places an estimate.

Extinction risk

The respondents were asked as part of the site attributes section of CA|RDS Lite whether if no conservation action took place the dolphins at their site were likely to be completely extirpated (lost or nearly lost) within the next 20 years. 37 sites responded (15 in Asia and 22 in South America), out of which 38 per cent of the sites predicted the probability of local extinction.

Threats

The threat assessment indicated important regional differences, with Asian sites reporting a wide range of immediate threats and South American sites identifying growing threats in the future. Specifically, sites in Asia reported three times the level of threat to their river dolphins compared with South American sites. Asia faces all the threats listed within the survey. Out of all the threats ranked by respondents from sites in Asia and South America, climate change impacts, illegal fishing and overfishing and underwater noise remained consistent challenges. The top five threats in Asia and South America are given in Figure 3.

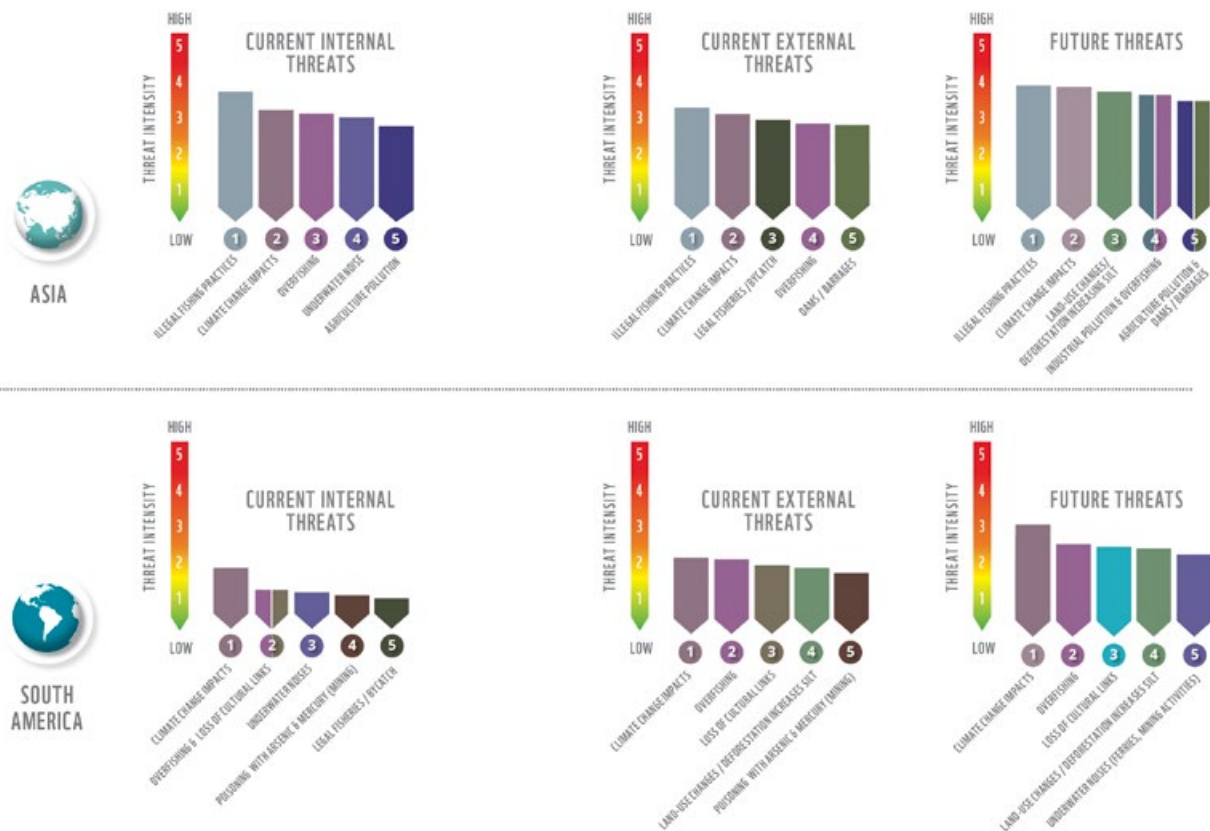


Figure 3. Combined highest ranked threats reported from each site by continent. Source: WWF (2023)

Table 1. Range countries, status and population abundance data

Country	Species	IUCN Red List Status of river dolphins	Estimated percentage of the total population represented in each site in the survey	Estimated total population
Asia				
Bangladesh	Ganges River Dolphin (<i>Platanista gangetica</i>)	Endangered (Kelhar et al., 2022)	1–10% (in each of the 6 sites that completed the survey)	Not known
Cambodia	Irrawaddy Dolphin (<i>Orcaella brevirostris</i>)	Critically Endangered (Brian & Beasley 2004)	91–100% (1 site)	89 (2020) Eam et al., 2020
China	Yangtze Finless Porpoise (<i>Neophocaena asiaeorientalis</i> ssp. <i>asiaeorientalis</i>)	Critically Endangered (Wang et al 2018)	1–10% (in each of the 2 sites)	1,249 (2023) Chinese Ministry of Agriculture and Rural Affairs, 2023
Indonesia	Irrawaddy Dolphin (<i>Orcaella brevirostris</i>)	Critically Endangered (Jefferson et al., 2008)	91–100% (1 site)	74–76 (2021) Kreb. Pers comm. 2023
Myanmar	Irrawaddy Dolphin (<i>Orcaella brevirostris</i>)	Critically Endangered (Smith 2004)	31–40% (for 1 site) / 41–50% (for 1 other)	79 (2020) Wildlife Conservation Society and Fisheries Department, 2020
Nepal	Ganges River Dolphin (<i>Platanista gangetica</i>)	Endangered	81–90% (1 site)	52 (2016) Department of Wildlife Conservation and National Park, 2016
Pakistan	Indus River Dolphin (<i>Platanista minor</i>)	Endangered (Braulik et al., 2022)	51–60% (for 1 site) / 1–10% (in each of the 2 sites)	1,987 (2018) Aisha et al., 2018, Aisha & Khan, 2021
South America				
Bolivia	Amazon River Dolphin (<i>Inia geoffrensis</i>)	Endangered (da Silva et al. 2018)	1–10% (in each of the 9 sites)	Not known
Colombia	Amazon River Dolphin (<i>Inia geoffrensis</i>)	Endangered	1–10% (in 2 of the 8 sites; data for the other 6 sites was not available)	Not known
	Tucuxi (<i>Sotalia fluviatilis</i>)	Endangered (da Silva et al. 2020)	No data available	
Peru	Amazon River Dolphin (<i>Inia geoffrensis</i>)	Endangered	1–10% (in 6 of the 7 sites; data for 1 site not available)	Not known
	Tucuxi (<i>Sotalia fluviatilis</i>)	Endangered	1–10% (in 5 of the 6 sites; data for 1 site was not available)	

Implementation of site management for river dolphin conservation

The average score for all the pillars (Figure 2) across all sites for river dolphin management implementation was 52 per cent of the possible maximum score. Only five sites scored above 75 per cent and more than half (22 out of 40) scored below 50 per cent. Scores varied considerably across sites, ranging from 27 to 96 per cent,

indicating that there is significant variation in how sites are managed.

Out of all the sites, four within Asia (one site each in Cambodia and Indonesia, along with two sites in China) reported the highest scores; exceeding 80 per cent across all the questions. These sites support critically endangered (sub)populations of species. The high scores reflect the substantial amount of investment made for the



Irrawaddy Dolphin fluke caught in a fishing net © WWF Cambodia

purpose of managing these sites as can be seen from the high scores on all elements of management (e.g. question 3.4 on adequate, sustainable funding, 2.1 on effective up-to-date management plans, 2.2 suitable trained staff, 2.3 necessary equipment and infrastructure, etc.) (see Supplementary Material for the full questionnaire).

In Asia, the highest proportion of responses (36 per cent) suggested that management needs were recognised, but no action was being planned. Bangladesh, Myanmar, Nepal and Pakistan were identified as having the highest need to move actions into the planning and implementation phase. South America reported low scores in site management; 19 per cent of the questions were scored as zero, compared with 5 per cent in Asia, with a zero-score indicating that specific management interventions have not been considered.

Strengths and weaknesses of river dolphin site management

The eight pillars (Figure 2) provided valuable insight into the strengths or weaknesses of site management across the countries taking part in the survey (Table 2).

Pillar 1: Conservation needs, design and site designation

Across all sites, questions relating to conservation needs, design and site designation scored 56 per cent. There was considerable variability among sites, with some scoring very well, such as Cambodia and China (above 90 per cent), but none scoring below 40 per cent.

Most of the sites recognise river dolphins as a conservation priority. However, ten sites in South America reported that river dolphins are not recognised

as priority targets for conservation in those sites, and thus are not included in their management plans. The lowest scoring question in this section related to how well the site is integrated within the management of the entire basin. Only Chinese sites have addressed this concern minimally.

Pillar 2: Management planning and capacity

Site managers need capacity in terms of resources and staff to develop management plans that are designed to meet conservation objectives. There was a huge variation in the average scores per country for this pillar – from 20 per cent to 95 per cent. When asked if they have capacity for river dolphin management, 63 per cent of the responses from the Asia sites noted the need for action was recognised but no action initiated. These are almost all sites outside Cambodia, China and Indonesia. The responses from South America were quite different. In general, the responses to these questions were higher in South America (55 per cent) than in Asia (48 per cent). However, when asked about the site having a management plan that sets out priorities, strategies and actions for river dolphins, the pattern of responses between continents was reversed.

Pillar 3: Financial systems and funding

Raising and managing funds is an important task for site managers. The responses per site for the two questions covering these issues averaged 51 per cent but the scores by country ranged from 25–100 per cent. The results showed that capacity varied from site to site: some sites possess the funding and also the capacity to manage funds, however, most do not. Sites in Bangladesh, Myanmar and Nepal in Asia, and Bolivia and Colombia in South America, reported that funding was inadequate.

Pillar 4: Human rights and equity

The responses to the questions regarding human rights and equity recorded on average 71 per cent; the highest ranking for all the pillars. This indicates that site management teams throughout the river dolphin range take into consideration the engagement of stakeholders such as the local communities when it comes to managing the site. South American countries recorded high scores (average 77 per cent) for this pillar. The three countries that reported the lowest average scores were Myanmar (48 per cent), Nepal (39 per cent) and Pakistan (48 per cent).

The question with the lowest score in this pillar was about benefit-sharing mechanisms (e.g. income from tourism-based dolphin watching) which was 44 per cent across all sites. Within four South American sites, the management teams reported that it was not applicable. In other places, for example in Peru, benefit-sharing is a

Table 2. River dolphin management score

Region	Country	No of sites	Average score (%) arranged in ascending order	Score for pillars as a percentage of maximum score							
				1 Conservation needs, design and designation of the site	2 Management Planning and Capacity	3 Financial Systems and Funding	4 Human rights and equity	5 Resource use (fishing, hunting, river transport)	6 Pressures (threats)	7 River dolphin and prey monitoring	8 Habitat and landscape approaches
Asia	Myanmar	2	36	40	20	31	48	40	38	31	41
	Bangladesh	6	37	46	28	44	58	37	23	38	22
	Nepal	1	44	58	35	25	39	45	64	50	38
	Pakistan	3	53	53	45	58	48	42	46	63	67
	Indonesia	1	81	75	60	63	93	85	94	100	81
	China	2	90	96	90	100	98	83	90	100	88
	Cambodia	1	93	96	95	88	82	85	91	88	94
South America	Bolivia	9	45	52	53	38	68	42	35	31	39
	Colombia	8	45	52	46	34	72	44	35	36	40
	Peru	7	65	57	66	80	93	74	45	43	63

major method to strengthen the buy-in for river dolphin conservation.

Pillars 5 and 6: Resource use (fishing, hunting, river transport) and Pressures (threats)

The average score per site was 42 per cent for management scores for threat mitigation, which was the lowest ranking of all the pillars. In Asia the lowest score was for actions to curtail threats from river transport (navigation) (27 per cent). South America scored lowest on monitoring and managing the health and mortality of river dolphins (4 per cent).

Pillar 7: River dolphin and prey population monitoring

Many sites are not conducting much river dolphin population related monitoring, with five sites not even monitoring population. The average score for Asia sites for this pillar was 69 per cent, (although five sites reported they were not monitoring population status) while the South America sites only averaged 25 per cent. Twenty-one out of the 24 South America sites reported they were either not considering monitoring or had plans to develop monitoring but these were not (yet) implemented.

Pillar 8: Habitat and landscape approaches

Management of freshwater is essential for preserving and/or repopulating river dolphin populations. The conservation or restoration of freshwater systems to maintain river dolphins had the highest score in this pillar (66 per cent), yet 45 per cent of the sites have not yet taken any action.

Most sites (55 per cent) indicated that they did not manage their local river dolphin population using a metapopulation approach. However, sites in China, Pakistan and Peru all show that they are managed as part of a broader species and metapopulation approach.

DISCUSSION

Freshwater biodiversity is declining far faster than in any other ecosystems, either marine or terrestrial (Collen et al., 2014; Costello, 2015), and populations of freshwater species have seen a global decline of 83 per cent (WWF, 2022). The survival of the river dolphin species relies on the management of freshwater PCAs. With the Kunming-Montreal Global Biodiversity Framework the world has committed to substantially increasing PCA coverage and establishment of habitat connectivity, including inland waters. But there are diverse and serious challenges that must be addressed for effective management of these areas for river dolphins.

The development of CA|RDS is an ideal opportunity for site managers to assess and improve their conservation

status. Conservation Assured | Tiger Standards (CA|TS) (Conservation Assured, 2018) have proven to be extremely effective for the tiger sites, for example in Nepal (DNPWC, 2022).

Considering the severity of the threats reported in the CA|RDS Lite assessment, management actions are needed across both continents to ensure river dolphin populations are safeguarded. In general, results suggest that sites in South America have greater capacity while those in Asia had more robust management plans; the latter probably driven by the higher threats to river dolphins faced in the region.

South America and Asia sites differ significantly in their management implementation, prioritisation, and responsiveness to threats. In Asia, management investment is concentrated on dealing with the immediate threats posed by high human population density and increasing economic activity within the site. Conversely, in South America, managers have more scope to adopt a preventative approach since they face fewer anthropogenic threats currently, possibly because the habitat is widespread, so the range is greater compared to the Asian species which are more restricted in their distribution and range. Critically endangered (sub)populations seem to have the best conservation management or the most comprehensive set of ongoing activities for example in China and Cambodia.

Most site managers recognised the significance of actively engaging with stakeholders, such as local and Indigenous communities, which is a positive result derived through this survey. Coordination with stakeholders paves the way for effective site management and could potentially be connected with river dolphin population monitoring that could, for instance, be carried out through a citizen science approach.

The results however indicate some clear warning signs of serious concerns with regards to river dolphin management. The lowest scoring question in pillar 1 related to how well the site is integrated within the management of the entire basin, which is alarming considering the implications of external threats and that large dolphin populations occur outside the PCAs. In some cases, sites with high management scores have declining populations (for example Cambodia), possibly due to a history of conservation efforts focused on the most imperilled populations facing a crisis situation. In South America, protected areas were designated for other species and objectives, and river dolphins just 'happen to be there'. However, there is a need to recognise the role of PCAs in the conservation of the relevant river dolphin



Ganges River Dolphin, Bangladesh © Rezaul/UNDP

species to align with management actions and goals accordingly.

There are clear ways to progress. Areas that require immediate attention include population and threat monitoring, which is recognised as being of high importance but is often inadequate or lacking. A high score in engagement with stakeholders and communities is certainly an asset for all sites. It is critical that site managers continue to actively engage and coordinate with stakeholders who are involved in river dolphin conservation off-site. Extensive work is needed to address the challenge of mitigating threats, both current and projected future threats, which also requires more capacity and resources. Several sites also lacked river dolphin management actions in their management plan, and some do not even recognise the presence of river dolphins within their borders. In these cases, capacity building amongst staff will be an important priority.

All river dolphin sites reported here are connected to large river systems. River dolphin populations cannot be managed in isolation without considering external factors both upstream and downstream. Looking into the possibilities of habitat restoration and connectivity in and among critical sites to facilitate the growth of the population is essential given that the threats are becoming more intense over time.

The site-level scores held within the WWF database can also help prioritise conservation actions and guide policy makers. For example, sites can be divided into four categories below. Investment can then be prioritised in sites which contain river dolphin populations, and which fall into category D.

Category A: high scores and highly critical populations, intense threats

Category B: high scores and less critical populations

Category C: low scores and low threats/less critical population

Category D: low scores and important populations and high threats.

This CA|RDS Lite survey was restricted to only 40 out of a total of 119 PCAs with known river dolphin populations and it was carried out through self-assessment. Some of the sites that comprised a wide habitat range did not respond to the survey. This could have led to results being biased towards sites that may have had more institutional capacity and interest in the survey topic. Therefore, the results do not encapsulate the entire area that is home to river dolphins. Furthermore, there was no site-based validation of the survey responses. A full implementation of CA|RDS would provide more comprehensive insights based on independent reviews.

CONCLUSION

CA|RDS Lite is a rapid assessment that found that there is some level of active conservation attention and management for river dolphins across their ranges. However, the complete CA|RDS system is necessary to fully assess the quality of management implementation and improve effective river dolphin management.

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SUPPLEMENTARY ONLINE MATERIAL

CA|RDS Lite survey

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REFERENCES

- Aisha H., Braulik G., Khan U., Leslie A. & Nawaz R. (2018). *Indus River Dolphin (Platanista gangetica minor) – an update on the population assessment and conservation challenges*. International Whaling Commission SC/67A/SM/18.
- Aisha, H. & Khan, U. (2021). *Abundance survey for Indus river dolphin*. Final Report, IWC Small Cetacean Fund.
- Braulik, G. T., Khan, U., Malik, M. & Aisha, H. (2022). *Platanista minor*. *The IUCN Red List of Threatened Species 2022*: e.T41757A50383490. <https://dx.doi.org/10.2305/IUCN.UK.2022-1.RLTS.T41757A50383490.en>
- Braulik G. T., Taylor B. L., Minton G., di Sciara G. N., Collins T., Rojas-Brocho L., Crespo, E. A., Ponnampalam, L. S., Double, M. C. & Reeves, R. R. (2023). Red-list status and extinction risk of the world's whales, dolphins, and porpoises. *Conservation Biology*, 37(5), e14090. <https://doi.org/10.1111/cobi.14090>
- Campbell, A., Kapos, V., Lysenko, I., Scharlemann, J., Dickson, B., Gibbs, H., Hansen, M. & Mikes, L. (2008). *Carbon emissions from forest loss in protected areas*. Cambridge: UNEP World Conservation Monitoring Centre.
- Chinese Ministry of Agriculture and Rural Affairs. (2023). *Yangtze finless porpoise population exceeds 1,200 in China*, CGTN <https://news.cgtn.com/news/2023-03-01/Yangtze-finless-porpoise-population-exceeds-1-200-in-China-1hOuJ66pdMk/index.html>
- Collen, B., Whitton, F., Dyer, E. E., Baillie, J. E. & Cumberlidge, N. (2014). Global patterns of freshwater species diversity, threat and endemism. *Global Ecology and Biogeography*, 23, 40–51. doi: 10.1111/geb.12096
- Conservation Assured. (2018). *CA|TS Manual Version 2*, June 2018. Singapore: Conservation Assured.
- Conservation Assured. (2021). *Conservation Assured River Dolphin Standards (CA|RDS)*. <https://www.riverdolphins.org/wp-content/uploads/2023/02/CARDS-2021-version-1.0.pdf>
- Conservation Assured. (2022). *The CA|TS Report: Looking back, looking forward 10 years of Conservation Assured | Tiger Standards*. Singapore: Conservation Assured.



Amazon River Dolphin underwater © WWF Brazil/Andriano Gambarini

- Costello, M. J. (2015). Biodiversity: the known, unknown, and rates of extinction. *Current Biology*, 25(9), 368–371. doi:10.1016/j.cub.2015.03.051
- da Silva, V., Martin, A., Fettuccia, D., Bivaqua, L. & Trujillo, F. (2020). *Sotalia fluviatilis*. *The IUCN Red List of Threatened Species 2020*: e.T190871A50386457. <https://dx.doi.org/10.2305/IUCN.UK.2020-3.RLTS.T190871A50386457.en>
- da Silva, V., Trujillo, F., Martin, A., Zerbini, A. N., Crespo, E., Aliaga-Rossel, E. & Reeves, R. (2018). *Inia geoffrensis*. *The IUCN Red List of Threatened Species 2018*: e.T10831A50358152. <http://dx.doi.org/10.2305/IUCN.UK.2018-2.RLTS.T10831A50358152.en>
- Department of National Park and Wildlife Conservation. (2022). Nepal's tiger population more than doubles. <https://www.zsl.org/news-and-events/news/nepals-tiger-population-more-doubles>
- Department of Wildlife Conservation and National Park. (2016). *National Ganges Dolphin Survey Nepal*, unpublished.
- Eam, S., Phay, S., Hang, S., Tan, S., Lor, K., Det, C. & Phorn, S. (2020). *The monitoring of Irrawaddy dolphin population in the Mekong river: the long-term population monitoring based on mark-resight models*. FiA/WWF Cambodia Technical Report.
- IUCN – SSC Cetacean Specialist Group <https://iucn-csg.org/baiji/>
- Jefferson, T. A., Karczmarski, L., Krebs, D., Laidre, K., O'Corry-Crowe, G., Reeves, R., Rojas-Bracho, L., Secchi, E., Slooten, E., Smith B. D., Wang, J. Y., & Zhou, K., (2008) *Orcaella brevirostris* (Mahakam River subpopulation). *The IUCN Red List of Threatened Species 2008*: (errata version published in 2016). *The IUCN Red List of Threatened Species 2008*: e.T39428A98842174.
- Kelkar, N., Smith, B. D., Alom, M. Z., Dey, S., Paudel, S. & Braulik, G. T. (2022). *Platanista gangetica*. *The IUCN Red List of Threatened Species 2022*: e.T41756A50383346. <https://dx.doi.org/10.2305/IUCN.UK.2022-1.RLTS.T41756A50383346.en>
- Mintzer, V. J., de Silva, V. M. F., Martin, A. R., Frazer, T. K. & Lorenzen, K. (2020). Protected area evaluation for the conservation of endangered Amazon river dolphins (*Inia geoffrensis*). *Biological Conservation*, 252, 108851. <https://doi.org/10.1016/j.biocon.2020.108851>
- Rodrigues, A. S. L., Akcakaya, H. R., Andelman, S. J., Bakarr, M. I., Boitani, L., Brooks, T. M., Chanson, J. S., Fishpool, D. C., Fonseca, G. A. B., Gaston, K. J., ... Yan, X. (2004). Global gap analysis: priority regions for expanding the global protected area network. *BioScience*, 54, 1092–1100. [https://doi.org/10.1641/0006-3568\(2004\)054\[1092:GGAPRF\]2.0.CO;2](https://doi.org/10.1641/0006-3568(2004)054[1092:GGAPRF]2.0.CO;2)
- Schipper, J., Chanson, J. S., Chiozza, F., Cox, N. A., Hoffmann, M., Katariya, V., Lamoreux, L., Rodrigues, A. S. L., Stuart, S. N., Temple, H. J., ... Young, B. E. (2008). The status of the world's land and marine mammals: Diversity, threat, and knowledge. *Science*, 322, 225–230. DOI: 10.1126/science.1165115
- Smith, B. D. & Beasley, I. (2004). *Orcaella brevirostris* (Mekong River subpopulation). *The IUCN Red List of Threatened Species 2004*, e.T44555A10919444. <http://dx.doi.org/10.2305/IUCN.UK.2004.RLTS.T44555A10919444.en>
- Smith, B.D. (2004). *Orcaella brevirostris* (Ayeyarwady River subpopulation). *The IUCN Red List of Threatened Species 2004*: e.T44556A10919593. <https://dx.doi.org/10.2305/IUCN.UK.2004.RLTS.T44556A10919593.en>. Accessed on 25 October 2023.
- Strokal, M., Bai, Z., Franssen, W., Hofstra, N., Koelmans, A. A., Ludwig, F., Ma, L., Van Puijenbroek, P., Spanier, J. E., Vermeulen, L. C., ... Kroeze, C. (2021). *Npj Urban Sustainability* 1(24). <https://doi.org/10.1038/s42949-021-00026-w>
- The Global Risks Report, 2023. Edition 18th Insight Report. World Economic Forum. Switzerland
- Wang, D., Turvey, S. T., Zhao, X. & Mei, Z. (2013). *Neophocaena asiaeorientalis ssp. asiaeorientalis*. *The IUCN Red List of Threatened Species 2013*, e.T43205774A45893487. <http://dx.doi.org/10.2305/IUCN.UK.2013-1.RLTS.T43205774A45893487.en>
- Wildlife Conservation Society and Fisheries Department. (2020). *Myanmar's Irrawaddy Dolphin Population Growing*, Myanmar Insider <https://www.myanmarinsider.com/myanmars-irrawaddy-dolphin-population-growing/>
- Willems, D., Walkington, D., Braulik, G., Khan, U., Frias, M., Minton G., Hoyland, I. & Melo-Santos, G. (2021). *River dolphin conservation and management: best practices from around the world*. Zeist, Netherlands: WWF International.
- WWF. (2022). *Living Planet report 2022 – Building a nature positive society*. Almond, R. E. A., Grooten, M., Juffe Bignoli, D. & Petersen, T. (Eds). Gland, Switzerland: WWF.
- WWF. (2023). *Safe havens for river dolphins: A rapid assessment of site management against the Conservation Assured| River Dolphin Standards*. Gland, Switzerland: WWF-International.

RESUMEN

Este documento presenta la evaluación rápida inaugural de los hábitats de los delfines de río, coincidiendo con sitios gestionados en Asia y Sudamérica. Cubriendo las seis especies de delfines de río (incluyendo la única marsopa de agua dulce del mundo), cada una está clasificada como En Peligro o En Peligro Crítico en la Lista Roja de la UICN. Los Estándares para la Conservación Asegurada de los Delfines de Río (CA|RDS) ofrecen directrices a medida para la supervisión competente de las áreas protegidas para los delfines de río. La versión abreviada de los CA|RDS, denominada CA|RDS Lite, consiste en una encuesta basada en un cuestionario realizada por administradores y partes interesadas en 40 sitios de 10 de los 14 países del área de distribución del delfín de río. Ambos continentes se enfrentan al peligro de extinción del delfín de río debido a la pesca y al cambio climático. En Asia, los riesgos son más diversos, con poblaciones más pequeñas en comparación con América del Sur. La financiación y la capacidad de gestión insuficientes aparecen como obstáculos significativos. La colaboración inadecuada con áreas fuera de los límites de las áreas protegidas impide la gestión eficaz de las poblaciones de delfines de río. Resulta alentador que la encuesta destaque la participación activa de las comunidades locales y las partes interesadas en la gestión del sitio. CA|RDS Lite ofrece una visión rápida de la eficacia de la gestión de los sitios, señalando los requisitos cruciales de gestión y los sitios urgentes de delfines de río que requieren intervención. También prepara el terreno para la aplicación completa de las normas CA|RDS y su uso como instrumento de acreditación y gestión.

RÉSUMÉ

Cet article présente la première évaluation rapide des habitats des dauphins de rivière, qui coïncide avec des sites gérés en Asie et en Amérique du Sud. Couvrant les six espèces de dauphins de rivière (y compris le seul marsouin d'eau douce au monde), chacune est classée comme étant en danger ou en danger critique d'extinction sur la liste rouge de l'UICN. Les normes CA|RDS (Conservation Assured | River Dolphin Standards) offrent des lignes directrices sur mesure pour une surveillance efficace des zones protégées pour les dauphins de rivière. La version abrégée des CA|RDS, appelée CA|RDS Lite, implique une enquête par questionnaire menée par des gestionnaires et des parties prenantes sur 40 sites dans 10 des 14 pays de l'aire de répartition du dauphin de rivière. Sur les deux continents, les dauphins de rivière sont menacés par la pêche et le changement climatique. En Asie, les risques sont plus diversifiés, avec des populations plus petites qu'en Amérique du Sud. L'insuffisance des financements et des capacités de gestion constitue un obstacle majeur. Une collaboration inadéquate avec les zones situées en dehors des limites des aires protégées empêche une gestion efficace des populations de dauphins de rivière. Il est encourageant de constater que l'enquête met en évidence l'implication active des communautés locales et des parties prenantes dans la gestion des sites. CA|RDS Lite offre une vue d'ensemble rapide de l'efficacité de la gestion des sites, mettant en évidence les besoins cruciaux en matière de gestion et les sites de dauphins de rivière nécessitant une intervention urgente. Il prépare également le terrain pour l'application complète des normes CA|RDS et leur utilisation en tant qu'instrument d'accréditation et de gestion.