



MARINE MAMMAL PROTECTED AREAS TASK FORCE



**IUCN Joint SSC/WCPA Marine Mammal Protected Areas Task Force  
Important Marine Mammal Areas (IMMAs)  
in Freshwater Environments  
Workshop Summary Report**

**22<sup>nd</sup> Society for Marine Mammalogy Biennial Conference,  
Sunday, 29<sup>th</sup> October 2017, Halifax, N.S., Canada**



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# **IUCN Joint SSC/WCPA Marine Mammal Protected Areas Task Force Important Marine Mammal Areas (IMMAs) in Freshwater Environments Workshop**

**Held at the 22<sup>nd</sup> Society for Marine Mammalogy Biennial Conference, Sunday,  
29<sup>th</sup> October 2017, Halifax, N.S., Canada - Room 305, Scotiabank Centre**

## **Workshop Summary Report**

Prepared by Michael J. Tetley (IUCN-MMPATF IMMA Coordinator) and Gill Braulik (IUCN-MMPATF Task Force Member)

### **Background to Workshop**

The IUCN Joint SSC/WCPA Marine Mammal Protected Areas Task Force (MMPATF) is in the process of identifying a global network of Important Marine Mammal Areas (IMMAs).

IMMAs are a place-based conservation tool identifying discrete portions of habitat that are important to marine mammals and have the potential to be delineated and managed for conservation. From 2016-2021, the IUCN-MMPATF is conducting a series of regional workshops of experts to identify IMMAs, using the IUCN WCPA Marine Planning Regions to inform the scope of each workshop. Workshops for the Mediterranean Sea and Pacific Islands regions have been completed to date, and four more workshops are in preparation: (1) North East Indian Ocean and South East Asian Seas, (2) Western Indian Ocean and Arabian Seas, (3) Australia-New Zealand waters and South East Indian Ocean, and (4) the South East Tropical and Temperate Pacific Ocean.

Marine mammal species that occur in freshwater environments, such as river dolphins, sirenians, and pinnipeds, present a slightly different scenario and application of the current IMMA Guidance than had been envisioned when that guidance was developed.

As highlighted during the River Dolphin Species Workshop held at the 2016 International Conference on Marine Mammal Protected Areas (ICMMPA4) the process to identify IMMAs within strictly inland and often freshwater-dominated environments requires further consideration and consultation with experts. In comparison to purely marine environments, inland freshwater habitats (riverine systems, freshwater lakes, and inland seas) are subject to differing ecological drivers, research considerations, and conservation management issues.

The aim of the Workshop on IMMAs in Freshwater Environments was to initiate a discussion with experts attending the Society for Marine Mammalogy Conference on the identification and utilisation of the IMMA tool for enhancing protection efforts for freshwater marine mammals (including MPAs, Key Biodiversity Areas, and other area-based measures or instruments).

## **Summary of Workshop Sessions**

Three sessions were held at the workshop attended by 10 marine and freshwater mammal experts with knowledge of South American river dolphins, South Asian river dolphins, Yangtze finless porpoises, freshwater populations of Irrawaddy dolphins, and Baikal seals (full list of participants can be found in Annex 1). These sessions were (I) assessment of opportunities for IMMAs to assist in freshwater conservation efforts, (II) identification of case studies (potential Areas of Interest or Aoi) for informing a future process of designating IMMAs in freshwater systems, (III) discussion of conservation and management issues affecting freshwater species and habitats.

### ***Session 1: Assessment of opportunities for IMMAs to assist in Freshwater Conservation Efforts***

The session started with presentations by Tetley and Braulik to provide background on the IMMA process and the selection criteria, and the potential list of species which could be missed in the currently scheduled 'marine-focused' IMMA work plan (2016-2021). These species comprised those that were considered to occur in exclusively inland areas, often dominated by freshwater environments and included landlocked seas, lakes, rivers and lacustrine/riverine systems/basins. The IMMA selection criteria were also compared against the Convention on Wetlands (Ramsar) criteria for the identification of Ramsar Sites for the conservation of wetlands of international importance (<http://www.ramsar.org>). Finally, the participants examined the IMMA selection criteria and provided examples of the types of species, habitats and conditions that potentially meet the IMMA selection criteria.

It was agreed that the IMMA selection criteria and process could be used successfully to identify important areas for freshwater species. It was further agreed that there was an apparent alignment (in both purpose and utility) between the IMMA and Ramsar Site selection criteria (See **Table 1**).

It was recommended that the currently planned series of workshops should focus on predominantly marine environments but that they should also try to capture areas importance to marine (and certain freshwater) species that use marine-influenced environments bordering coastal waters such as lagoons, deltas and estuaries. Species occurring within other non-marine (often freshwater-dominated) systems could be considered separately within a parallel expert-based process, within the IUCN-MMPATF's programme of work, possibly in conjunction or alignment with the Ramsar Sites and/or KBA processes. It was recommended that such a parallel process be restricted to the list of species in **Table 2**.

**Table 1: Overlap of IMMA and RAMSAR selection criteria**

<p align="center"><b>IMMA Selection Criteria</b></p> <p>Discrete portions of habitat, important to marine mammal species, that have the potential to be delineated and managed for conservation</p>	<p align="center"><b>Ramsar Site Selection Criteria</b></p> <p>Group B on sites of international importance for conserving biological diversity criteria based on species and ecological communities</p>
<p><b>Criterion A - Species or Population Vulnerability:</b>  <i>Areas containing habitat important for the survival and recovery of threatened or declining species or populations.</i></p>	<p><b>Criterion 1:</b>  <i>A wetland should be considered internationally important if it supports vulnerable, endangered, or critically endangered species or threatened ecological communities.</i></p>
<p><b>Criterion B - Species or Population Vulnerability:</b></p> <p><b>Sub-criterion Bi - Small and Resident Populations:</b>  <i>Areas supporting at least one resident population, containing an important proportion of that species or population, which are occupied consistently.</i></p> <p><b>Sub-criterion Bii - Aggregations:</b>  <i>Areas with underlying qualities that support important concentrations of a species or population.</i></p>	<p><b>Criterion 8:</b>  <i>A wetland should be considered internationally important if it regularly supports 1% of the individuals in a population of one species or subspecies of wetland-dependent non-avian animal species.</i></p>
<p><b>Criterion C - Key Life Cycle Activities:</b></p> <p><b>Sub-criterion Ci - Reproductive Areas:</b>  <i>Areas and conditions that are important for a species or population to mate, give birth, and/or care for young until weaning.</i></p> <p><b>Sub-criterion Cii - Feeding Areas:</b>  <i>Areas and conditions that provide an important nutritional base on which a species or population depends.</i></p> <p><b>Sub-criterion Ciii - Migration Routes:</b>  <i>Areas used for important migration or other movements, often connecting distinct life cycle areas or connecting different parts of the year-round range of a non-migratory population.</i></p>	<p><b>Criterion 3:</b>  <i>A wetland should be considered internationally important if it supports plant and/or animal species at a critical stage in their life cycles, or provides refuge during adverse conditions.</i></p>
<p><b>Criterion D - Special Attributes:</b></p> <p><b>Sub-criterion Dii - Diversity:</b>  <i>Areas containing habitat that supports an important diversity of species.</i></p>	<p><b>Criterion 2:</b>  <i>A wetland should be considered internationally important if it supports populations of plant and/or animal species important for maintaining the biological diversity of a particular biogeographic region.</i></p>

**Table 2: List of species to be considered for a parallel inland-focused IMMA expert-identification process**

Common Name	Scientific Name	Red List Category	Water Body	Location
Ladoga ringed seal	<i>Pusa hispida ladogensis</i>	VU	Lake Ladoga	Russia
Saimaa ringed seal	<i>Pusa hispida saimensis</i>	EN	Lake Saimaa	Finland
Caspian seal	<i>Pusa caspica</i>	EN	Caspian Sea	Azerbaijan; Iran; Kazakhstan; Russian Federation; Turkmenistan
Baikal seal	<i>Pusa sibirica</i>	LC	Lake Baikal	Russia
Ungava harbour seal	<i>Phoca vitulina mellonae</i>	EN	Lakes of the Ungava Peninsula	Canada
Ganges River dolphin	<i>Platanista gangetica gangetica</i>	EN	Ganges, Brahmaputra and Karnaphuli River systems	India, Bangladesh, Nepal
Indus River dolphin	<i>Platanista gangetica minor</i>	EN	Indus River system	Pakistan, India
Boto	<i>Inia geoffrensis geoffrensis</i>	DD	Amazon, Orinoco and Araguaia-Tocantins River systems	Brazil; Colombia; Ecuador; Peru; Venezuela
Bolivian bufeo	<i>Inia geoffrensis boliviensis</i>	DD	Amazon River system	Bolivia
Tucuxi	<i>Sotalia fluviatilis</i>	DD	Amazon and Orinoco River systems	Brazil; Colombia; Ecuador; Peru
Yangtze finless porpoise	<i>Neophoceana asiaorientalis asiaorientalis</i>	CR	Yangtze River system	China
Irrawaddy dolphin – Mekong River	<i>Orcaella brevirostris</i>	CR	Mekong River	Cambodia
Irrawaddy dolphin – Ayeyarwady River	<i>Orcaella brevirostris</i>	CR	Ayeyarwady River	Myanmar
Irrawaddy dolphin – Mahakam River	<i>Orcaella brevirostris</i>	CR	Mahakam River	Indonesia
Amazonian manatee	<i>Trichechus inunguis</i>	VU	Amazon River system	Brazil; Colombia; Ecuador; Peru
African manatee	<i>Trichechus senegalensis</i>	VU	Numerous rivers, lagoons and estuaries in West Africa	21 West African countries

Participants discussed the terminology used around the IMMA tool, in particular the issue of referring to many wholly freshwater-dependent species as ‘marine mammals’. This may

initially pose a problem when trying to generate interest in the IMMA tool on the part of freshwater researchers and conservationists. Also, some inland areas are not wholly freshwater habitats either, including the saline or brackish inland lakes and seas. Therefore, it may be necessary to provide further clarity within the IMMA guidance on the intended purpose of the IMMA tool when used in such inland environments, and the potential necessity of consulting with further experts on the use of additional 'inland conversation' terminology to be used as part of the IMMA identification process.

When discussing the applicability of IMMA criteria to inland marine mammal populations, the participants discussed examples of habitats and species which may satisfy the various IMMA criteria. Because the majority of inland marine mammal species occur in restricted habitat, as small populations, are Red Listed as threatened, and complete their entire life cycle within these discrete areas in almost all cases, most of the IMMA criteria seemed to apply to them. It would be expected, then, that at least one IMMA, and potentially several, could be delineated for each inland marine mammal population. Participants suggested that the existing criteria would be satisfied for inland marine mammals in the following scenarios:

***Criterion A - Species or Population Vulnerability:***

Perhaps the most easily satisfied criterion for the majority of inland marine mammal populations would be cases in which the entire species or subspecies inhabits a discrete area. This would apply to the Caspian seal and the Baikal seal (both at species level), the Indus River and Ganges River dolphins and the Yangtze finless porpoise (all at subspecies level).

***Criterion B - Distribution or Abundance:***

The middle river sections of three Southeast Asian river systems (Ayeyarwady, Mekong and Mahakam) that support critically endangered and isolated resident populations of Irrawaddy dolphins would meet this criterion.

***Criterion C - Key Life Cycle Areas:***

This criterion would apply to stable seasonal ice shelf formations that are important for Caspian seal reproduction; possibly to confluence areas in many South American river systems in which botos and tucuxis aggregate to feed; refuge areas in the Amazon basin where Amazonian manatees congregate during the dry season; and river sections used as transit corridors between additional justified important habitats (feeding, breeding, aggregations etc.) for Mahakam Irrawaddy dolphins.

***Criterion D - Special Attributes:***

This criterion may apply to areas supporting genetically distinct sub-populations of Yangtze finless porpoises; and areas that support both species of cetaceans as well as manatees (high freshwater diversity) that occur in much of the Amazon River basin.

***Session 2: Identification of case studies (as potential AoI) for informing a future process of designating IMMAs in freshwater systems***

In the afternoon session of the workshop, participants were encouraged to submit examples of case studies of potential areas of interest which could become candidate IMMAs if considered as part of a broader process to identify IMMAs beyond the currently planned 'marine-focused' expert regional workshops.

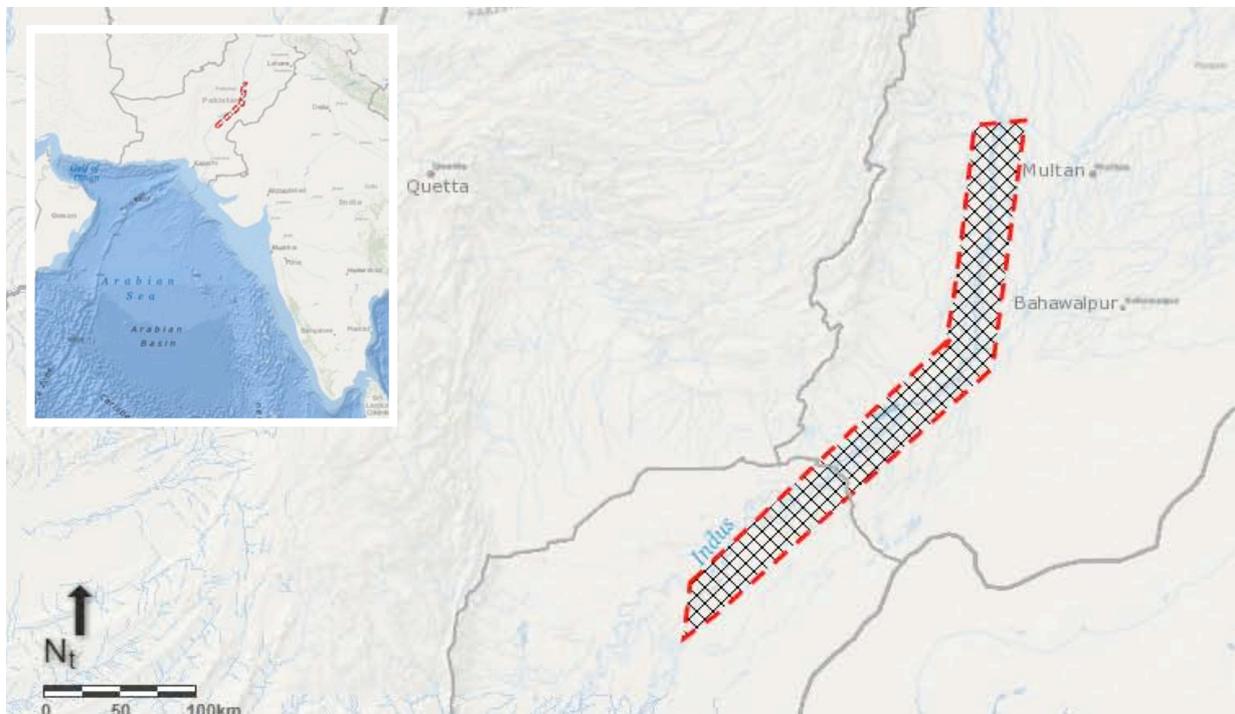
Participants were introduced to the IMMA SeaSketch Online Facility, developed in partnership with the McClintock Lab ([www.mcclintocklab.org](http://www.mcclintocklab.org)) at the University of California

Santa Barbara's Marine Science Institute. This facility allows users to sketch their areas of interest (Aoi) online using a user-friendly Web-GIS interface, which can be populated with information on the area, species and habitats, and initial assessment against the IMMA selection criteria. Once submitted, these proposals become readily available to the IMMA secretariat in a GIS-ready format (i.e. shapefile) for use in informing the future identification of candidate IMMAs.

After a period of guided training in the basic use of the IMMA SeaSketch Facility, participants selected four case-study areas to use to test the utility of the IMMA selection criteria. Three of the four areas are as follows:

### **Central Indus River Area of Interest - Aoi**

The area includes the two largest Indus River dolphin (*Platanista gangetica minor*) sub-populations, which together account for approximately 90% of the entire subspecies population.



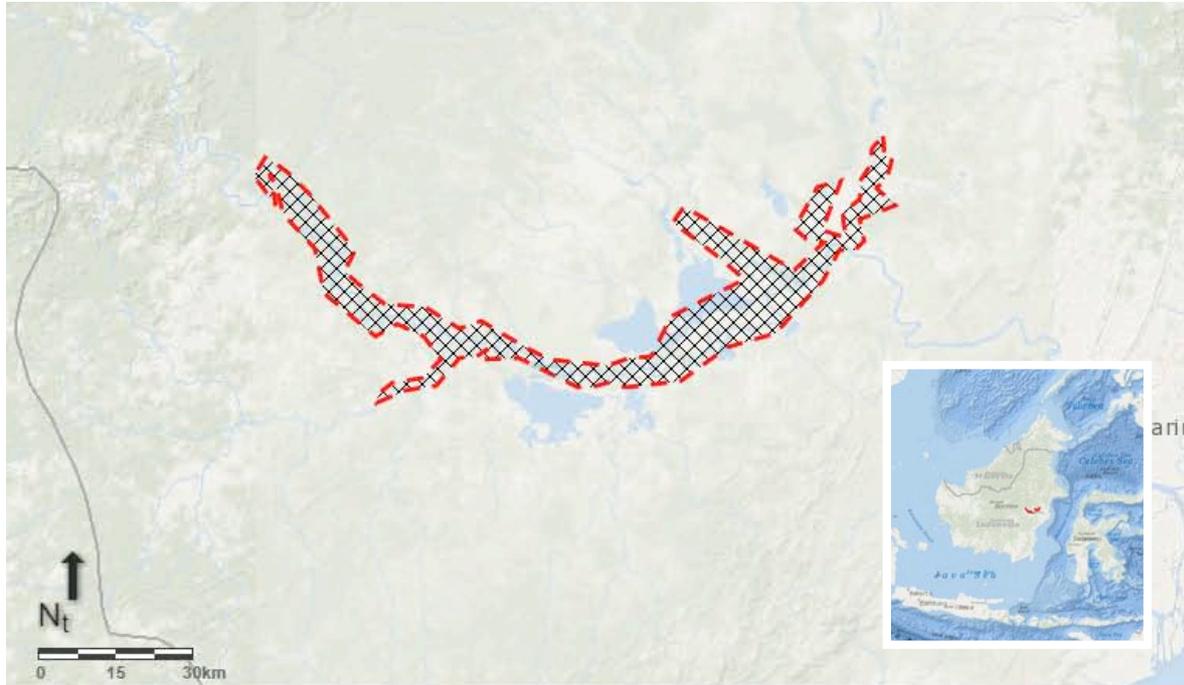
The Central Indus Aoi is the central section of the Indus River between Taunsa, Guddu and Sukkur barrages in Pakistan. This area has exceptionally high aquatic biodiversity and today hosts more than 90% of all surviving Indus River dolphins, divided into two subpopulations separated by a virtually impassable irrigation barrage. The abundance of dolphins in the Aoi was estimated at approximately 1300 in 2011 (WWF-Pakistan).

### **IMMA Selection Criteria**

A: The area contains habitat important for the survival and recovery of the Indus River dolphin which is listed as Endangered on the Red List; Bi: The area supports two resident subpopulations that contain 90%+ of the current subspecies population, and the habitat is occupied consistently year-round.

### ***Middle Mahakam River Area of Interest - Aoi***

The Middle Mahakam Area represents the high-density area of the Critically Endangered population of Irrawaddy dolphins in East Kalimantan, Indonesia. The area contains important habitat needed for all life stages and includes prey resources in the main river as well as nearby peat swamp habitat.



The Aoi is a wetland area where the main Mahakam River connects with several major tributaries and large lakes (11,000-15,000 ha), minor lakes, and swamps, all of which serve as fish spawning and nursery areas. The dolphins move into swamps and lakes at high water and/or during floods and use them as feeding areas as well as reproduction areas. They also move upstream into the tributaries at high water. They are concentrated in the main river during the dry season and sometimes move outside (upstream of) their usual range. Thirty villages inside this area contain 30,000 people, of whom 90% depend on fishing activities for daily livelihoods and may pose additional concerns to Mahakam River Irrawaddy dolphins.

### ***IMMA Selection Criteria***

A: The population is listed as Critically Endangered; Bi: The dolphins are resident and live their entire lives in this river, separated from all coastal populations of Irrawaddy dolphins; C: The entire proposed IMMA provides habitat for all vital functions in the species' life cycle including Ci: Reproductive Areas and Cii: Feeding Areas; Di: The DNA of the Mahakam dolphins has two unique haplotypes that differentiate the population from other coastal and riverine populations of the species

### ***Araguaia River Area of Interest - Aoi***

This Aoi includes a RAMSAR site (Araguaia National Park – Bananal Island) and three regional protected areas (Cantão State Park, Araguaia State Park and Meandros do Araguaia Protected Area) in Brazil. It has a high density of botos (*Inia geoffrensis*) and represents one of the most important areas for the species in the Araguaia-Tocantins river basin.



This area provides a variety of habitats important for the maintenance of a healthy population of botos, especially confluences. The northern section is also a transition zone between the Cerrado biome and the Amazon biome. This area is recognized as being very important for the Cerrado biome and its fauna and flora. As a result, it has been (unofficially) agreed by government environmental agencies that no further development (i.e. no hydroelectric dams) should be allowed in the Araguaia River. Since the other main river of this basin (the Tocantins River) is already heavily dammed and the botos in that river are now seriously fragmented, it is important to maintain the Araguaia River as a more nearly pristine habitat for the species.

#### ***IMMA Selection Criteria***

Criterion B: Sub-criterion Bii: Aggregations - Areas with underlying qualities that support important concentrations of a species or population; Criterion Ci: Reproductive Areas and Cii: Feeding Areas.

***Session 3: Discussion of conservation and management issues affecting freshwater species and habitats.***

Participants discussed some of the potential uses of the IMMA tool for assisting in the management and conservation of marine mammals in inland and freshwater areas. Of primary interest to many was the ability of IMMA designations to raise political and public awareness of the need for specific habitat-scale protection measures as part of wider species conservation plans.

Among the threats faced by marine mammals in inland areas are dams and other hydro-power developments; pollution from upstream domestic or industrial activities; fishing; poorly regulated tourism; and other landscape-scale developments which can alter the course or water level of large delta, riverine or lake systems.

Of particular interest to the river dolphin experts present were the issues surrounding the damming of large river systems. Dams may, in some instances, initially cause an increase in the density of botos around new structures that aggregate prey or create turbulence that encourages foraging activity. Alternatively, in the case of Indus River dolphins, such developments have been observed to alter the distribution of dolphins away from dams and into the middle portions of undammed river sections. All participants agreed that, in the long term, dams restrict the movement of animals, interrupt gene flow and reduce the potential for the survival of these fragmented subpopulations.

Another relevant issue is that freshwater systems will always be heavily influenced by human activities that take place not only inside but also outside the boundaries of the IMMA, especially upstream or on adjacent land. Therefore, to make inland or freshwater IMMA designations effective, it will be necessary to manage human activities both inside and outside the IMMA boundaries.

## **Workshop Conclusions and Recommendations:**

- Marine mammals that occur in habitats influenced by freshwater (such as lagoons, estuaries, deltas, etc.) are appropriate for consideration within the IUCN-MMPATF's 'marine- focused' work plan for IMMAs, with some adaptations.
- Species that inhabit 'inland' aquatic areas will be more appropriately assessed as part of a parallel IMMA process outside of the IUCN-MMPATF's 'marine- focused' work plan for IMMAs.
- Clear terminology is required for 'inland' IMMAs identified as products of that parallel process, and it will be necessary to engage with the freshwater conservation community. A preliminary suggestion is to use the term 'Inland IMMAs'.
- The species listed in Table 2 should be the focus of such a process.
- The IUCN-MMPATF should communicate further with individuals (including those identified by workshop participants) within the Ramsar Convention concerning the applicability of the IMMA criteria and IMMA identification process, with the goal of contributing to the selection of Ramsar Sites and participating in freshwater conservation activities of that convention.
- The group attending the workshop should continue to develop and identify potential case studies as Areas of Interest, beyond those communicated in this report, for the species listed in Table 2, and they should continue to engage other experts to help collate the needed information.
- The workshop organisers should continue to consult with the participants of the workshop to advance the aim of conducting a parallel inland IMMA process, under the Umbrella of the IUCN-MMPATF, and that they work to create a directory of other experts working on inland species described in Table 2 of the report.

## **Acknowledgements**

The IUCN-MMPATF and workshop organisers thank the participants for their contributions. The organisers also thank those experts who provided responses to the pre-workshop survey on IMMAs in Freshwater Environments, which assisted to form the agenda and points of discussion held in the sessions of the workshop. Finally, the Society for Marine Mammalogy Biennial Conference organisers are thanked for the assistance they provided in organising the venue and facilities for post-conference workshop delegates.

## ANNEX 1 - Workshop Participant List

Michael Tetley	IMMA Coordinator - IUCN-MMPATF	United Kingdom
Gill Braulik	University of St Andrews	United Kingdom
Randall Reeves	Okapi Wildlife Associates	Canada
Claryana Araújo-Wang	Botos do Cerrado - Pesquisas Ambientais	Brazil
Danielle Krebs	Yayasan Konservasi RASI	Indonesia
Lisa Rotterman	NOAA	United States
Prem Sarup Sharma	University of São Paulo - Oceanographic Institute	Brazil
Alejandra Vergara-Pena	Bangor University - School of Ocean Sciences	United Kingdom
Mei Zhigang	Chinese Academy of Sciences - Center for Aquatic Biodiversity and Resource Conservation	China

## ANNEX 2 - Workshop Agenda and Facilities:

- 08:30-09:00 - Arrival and Welcome
- 09:00-10:30 - **Presentation Session:** Introduction to the IMMA global programme of work and alignment with the Ramsar Convention.
- 10:30-11:00 - Coffee Break 1
- 11:00-12:30 - **Group Session 1:** Assessment of opportunities for IMMAs to assist in Freshwater Conservation Efforts
- 12:30-13:30 - Lunch Break
- 13:30-15:30 **Group Session 2:** Identification of Areas of Interest (Aoi) case studies for informing a future Freshwater systems identification process
- 15:30-16:00 - Coffee Break 2
- 16:00-17:00 - **Group Session 3:** Discussion on conservation and management issues effecting freshwater species and habitats.
- 17:00-17:30 - Closing Remarks and Workshop Close

To assist with informing the activities of the workshop the organisers provided the following facilities for participants in advance of the meeting:

- 1) An online storage facility (Dropbox) contain summaries of the presentations and a copy of the current IMMA User Guidance Document. The facility is also open to any participants who may wish to upload any documents or reports of interest for the other workshop attendees: **IUCN-MMPATF SMM Workshop Dropbox** - <https://tinyurl.com/y7lo2web>
- 2) An online survey (Forms+) about the suitability of the IMMA Selection Criteria for the identification of marine mammal areas of conservation importance in freshwater environments: **IUCN-MMPATF Survey on IMMAs in Freshwater Environments** - [www.formpl.us/form/5125618767233024](http://www.formpl.us/form/5125618767233024)
- 3) An online GIS Mapping Tool (IMMA SeaSketch Project) which can be used to highlight any Areas of Interest (Aoi) for marine mammal species in freshwater environments which you may wish to submit to the IUCN-MMPATF: **IMMA SeaSketch Mapping Tool** - <https://tinyurl.com/y8qxzytt>