Report of the technical workshop on the research strategy to assess the status of the Australian snubfin dolphin (*Orcaella heinsohni*) and other inshore dolphins
Melbourne, Australia, 10-11 December 2012

1. INTRODUCTORY ITEMS

1.1 Welcome and opening remarks

Robert Harcourt welcomed participants and acknowledged the traditional owners of the land on which we met. He went on to highlight the fact that the purpose of the Technical workshop was to bring together a core group of leading cetacean researchers, statisticians and indigenous representatives to achieve the objectives stated below.

1.2 Objectives of the workshop

i. Review the contemporary challenges of listing marine species under the EPBC Act;
ii. Identify the most appropriate criteria for assessing the status of Australian snubfin (*Orcaella heinsohni*) dolphins (hereafter 'snubfin dolphins');
iii. Review the research objectives identified in the draft Coordinated Research Strategy against the appropriate criteria identified in Objective 2;
iv. Agree on a sound and appropriate framework for conducting research that will provide sufficient data to assess the status of Australian inshore dolphins, in particular the snubfin dolphin, incorporating overall design, methodologies, distribution of effort, timelines and indicative costs.

The products of the Technical Workshop were to be a workshop report and an Australian Inshore Dolphin Research Framework that would be presented at a second Stakeholder Workshop and made publicly available on the Department of Sustainability, Environment, Water, Population and Communities' (DSEWPaC) and Australian Marine Mammal Centre (AMMC) websites.

1.3 Introductions and apologies

Each workshop participant introduced themselves and their respective roles. A list of workshop participants and the agenda can be found in Appendices 1 and 2, respectively.

Apologies were received from Chelsea Marshall, Gumma IPA, Nambucca Heads, New South Wales.

2. ELECTION OF CHAIR, APPOINTMENT OF RAPPORTEUR/S

There were 18 attendees in total (see Appendix 1 for a list of participants) representing research organisations, federal and state government agencies, the Threatened Species Scientific Committee (TSSC), and the Indigenous Advisory Committee. Attendees came from the Australian Capital Territory, New South Wales, Northern Territory, Queensland, Western Australia, South Australia, Tasmania and Victoria, hereafter referred to as *the working group*. Robert Harcourt chaired the workshop and Virginia Andrews-Goff and Elanor Bell (DSEWPaC) acted as rapporteurs.

3. MEETING DOCUMENTS

A list of documents provided to the working group can be found in Appendix 3.

4. BACKGROUND PRESENTATIONS

A range of background presentations were delivered throughout the first morning of the workshop. A summary of these presentations follows.

4.1 Background and recent history of the project
Sylvana Maas

Sylvana Maas of the Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC) presented an historical overview of the nomination to list the Australian snubfin dolphin (*Orcaella heinsohni)* under the *Environment Protection and Biodiversity Conservation Act 1999* and the involvement of DSEWPaC.

In 2011, the snubfin dolphin was nominated for listing under the EPBC Act. This nomination was prepared by the World Wide Fund for Nature (WWF) and was complemented by a verbal nomination given to the Threatened Species Scientific Committee (TSSC) by an indigenous representative.

A key challenge in the assessment of this species is the availability of information to assess their conservation status. This lack of information was also the key reason that the Australian Government's TSSC did not recommend inclusion of the Australian snubfin dolphin on the 2011 Final Priority Assessment List (FPAL). When announcing the FPAL the Minister indicated that DSEWPaC would undertake to facilitate research to fill knowledge gaps to allow an assessment of this species in the future. To progress this work DSEWPaC commissioned the production of a research strategy to ensure that this work would be undertaken in the most time and cost effective way.

In early 2012, Flinders University was contracted to undertake a gap analysis to identify existing data deficiencies and develop a draft coordinated research strategy that addresses information gaps. The intention of this work was to provide the TSSC the information they need to assess the conservation status of the Australian snubfin and the Indo-Pacific humpback (*Sousa chinensis*) dolphins.

4.2 EPBC Act listing processes (including challenges of listing data deficient species)
Andrea Taylor

Andrea Taylor (representing the TSSC) gave an overview of the EPBC Act listing process (species, ecological communities and key threatening processes) and the other responsibilities of the TSSC (recovery and threat abatement planning). A large proportion of Australia's threatened species list was compiled under the previous legislation. There is no information available as to why each of these species was listed. By contrast, listings under the EPBC Act are accompanied by detailed listing advices that outline assessment of the status against each of five criteria (based on the International Union for Conservation of Nature (IUCN) criteria, but with some differences) that relate to the risk of extinction of the species nationally. Marine species are under-represented on the list, indicative of the difficulties in obtaining sufficient data for the necessary rigorous scientific assessment of their status. There is no 'data deficient' category under the EPBC Act.

Public nominations are received annually and prioritised for assessment by the TSSC, considering a range of factors including whether available information is likely to be adequate to allow assessment. A proposed priority assessment list (or PPAL) is provided to the Minister, who decides on the final list (the FPAL).

The assessment guidelines used by the TSSC are publically available. These allow for the use of estimated, inferred or projected decline, giving some scope for dealing with data deficiency in the

strict sense, but still requiring a strong evidence base. A species only needs to meet one criterion to be eligible for listing. Once a recommendation has been made, the Minister must make a decision based on the TSSC's advice and public submissions, considering only the effect that listing will have on survival of the species in Australia. Every listed entity has conservation advice and may also have a recovery plan. Neither nomination nor placement on the FPAL guarantees listing.

There was a discussion of marine 'megafauna' (mammals and sharks) currently listed as threatened, in relation to the criteria under which they were listed, where it is known. The protections offered by threatened species listing (regulation, funding, recovery plan etc.) were touched upon. A 'migratory species' classification offers some degree of regulatory protection, although the significant impact guidelines differ from those for threatened species. The TSSC has no role in the regulatory aspects of the Act.

The main take home message was that EPBC Act threatened species assessments are strongly evidence based and are undertaken over the national extent of the species.

4.3 Appropriate criteria for listing snubfin dolphins
Isabel Beasley

On behalf of the authors, Dr. Isabel Beasley presented the, *Review of Australian snubfin dolphin nomination for listing as threatened species under the EPBC Act* (Beasley et al., 2012a).

Given concerns over the conservation status of the Australian snubfin dolphin, *Orcaella heinsohni*, WWF-Australia nominated the species to be listed as 'vulnerable' under Criterion 1A2 (c, d), Criterion 1A3 (c, d) and Criterion 2A(iii) of the Environment Protection and Biodiversity Conservation (EPBC) Act in 2010. This nomination was unsuccessful and the Threatened Species Scientific Committee (TSSC) provided feedback that a lack of adequate information provided, or available, on snubfin dolphins was a key factor in precluding a successful nomination.

A review of the snubfin dolphin 2011 nomination indicated that key pieces of information were missing for assessment of conservation status and listing under the EPBC Act, primarily a robust estimate of total population size (Beasley et al., 2012a).

Although national estimates of occupancy, abundance and population trends of snubfin dolphins are not available, obtaining sub-population relative abundance estimates or alternative indexes (e.g. occupancy as a surrogate for abundance estimates) of sub-populations (i.e. geographically or otherwise distinct groups in the population between which there is little demographic or genetic exchange) is achievable. As such, time series estimates of relative abundance or occupancy coupled with Mortality Limit (ML)[1] estimates could be calculated for each subpopulation. This information may therefore be appropriate for a future nomination under Criterion 1 A3 (a,b and d) *(a population size reduction, projected or suspected to be met within the next 10 years or three generations, as evidence by (a) direct observation, (b) an index of abundance appropriate to the taxon and (d) actual or potential levels of exploitation).*

Monitoring of abundance, occupancy and mortality events for these sub-populations over time will be particularly important to document actual or predict suspected declines in population size. The snubfin dolphin is subject to both incidental capture in fishing gear and habitat degradation through

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[1] The mortality limit (termed the Potential Biological Removal, *PBR*, under the U. S. Marine Mammal Protection Act) for cetaceans is calculated as the product of a minimum population estimate (N_{MIN}), one-half of the maximum net productivity rate (R_{MAX}), and a recovery factor (F_R) (Wade, 2006).

coastal development. There is an immediate and pressing need to quantify these threats across northern Australia. In order to determine the extent of anthropogenically induced mortality and compare this to calculated MLs it will be important to determine causes of death, where possible. An exceeded ML in a number of sub-populations should contribute quantifiable evidence for *a future nomination under Criterion 1 A3 (a, b and d) - suspected population size reduction based on (a) direct observation, (b) an index of abundance appropriate to the taxon* and *(d) actual or potential levels of exploitation*.

Although the snubfin dolphin is widely distributed around northern Australia, there is indication (from population genetic studies in Queensland) that populations are fragmented. Therefore, Criterion 2 (*Its geographic distribution is precarious for the survival of the species… (a) severely fragmented or known to exist at a limited location (b) Continuing decline, observed, inferred or projected, in (iii) area, extent and/or quality of habitat*) may also be appropriate for a future nomination. However, a nomination using 2 (a) will likely need to provide a national assessment of the degree of fragmentation of sub-populations based on molecular studies. Further, a nomination using 2 (b) (iii) will need to provide quantitative evidence of the amount and extent of habitat directly affected/altered by coastal development and how this area compares to snubfin dolphin extent of occurrence and area of occupancy.

In terms of other relevant nomination components, most biological information (apart from some diet data and the estimate of longevity) on the snubfin dolphin has been inferred from related species (such as the Irrawaddy dolphin, *Orcaella brevirostris*, or the tucuxi, *Sotalia fluviatilis*). Life history data is particularly important for estimating the future size and risk of extinction for animal populations through modelling approaches such as Population Viability Analysis (PVA). There is, thus, a pressing need to obtain life history information on snubfin dolphins. Carcasses recovered from stranding programs and the shark net program hold valuable life history information and their recovery for future analysis should be part of a coordinated research strategy. This biological information, combined with sub-population abundance estimates, will enable a future Population Viability Analysis (*Criterion 5a: Probability of extinction in the wild within a period, based on quantitative analysis*) to be conducted.

The authors of the draft coordinated research strategy (Parra et al., 2012) informally approached the TSSC about the 2011 snubfin dolphin nomination and sought feedback on a potential strategy to contribute information to a future nomination. We received positive feedback on this strategy, which proposes a three-stage approach as follows:

> **1.** Conduct a broad-scale assessment (in collaboration with Indigenous sea ranger groups in many areas) to identify sites at which snubfin dolphins occur, and approximate numbers (tens, hundreds, thousands) at each site;
> **2.** Undertake an assessment of the threatening processes at each of these sites; and,
> **3.** Select key sites across northern Australia (i.e. in Western Australia, Northern Territory and Queensland) at which to conduct dedicated abundance estimation and occupancy patterns.

Ideally, the key research sites should include both sites subject to coastal development and those that are relatively undisturbed as quasi-controls. Research design and field methods employed should be consistent across sites, and developed with input from biological statisticians, such as Prof. Ken Pollock (North Carolina State University) and Dr. Lyndon Brooks (Southern Cross University).

4.4 Presentation of the 'Draft coordinated research strategy to collect information required to assess the national conservation status of Australian tropical inshore dolphins'

Guido Parra

On behalf of the authors, Dr. Guido Parra presented the, *Draft coordinated research strategy to collect information required to assess the national conservation status of Australian topical inshore dolphins* (Parra et al. 2012), commissioned by DSEWPaC.

The Draft Research Strategy proposed aims to address issues around the conservation assessment of Australian tropical inshore dolphins, particularly Australian snubfin, *Orcaella heinsohni*, and Indo-Pacific humpback dolphins, *Sousa chinensis*, and provide a platform for the development of a coordinated research strategy to address knowledge gaps. The report assessed 1) the requirement towards a coordinated research strategy, 2) the data required in order to assess the conservation status of tropical inshore dolphins in Australia, 3) the challenges in filling in gaps of information, and 4) the potential pathways toward obtaining the information relevant to species conservation assessments.

The assessment of snubfin and humpback dolphins' conservation status requires extensive information on their population demography and natural history. Filling in the gaps of information will require a structured, hierarchical, large scale monitoring programme that is 1) spatially and temporally comprehensive, 2) rigorous in its treatment of sampling error, and 3) sustainable over the time scales necessary to examine population trends. The large extent of occurrence of snubfin and humpback dolphins, their apparent low densities, their inconspicuous surfacing behaviour, apparent unsuitability of large scale surveying techniques (e.g. aerial surveys), the need for a strong collaborative approach among researchers, and limited financial resources to carry out such a comprehensive monitoring effort poses considerable challenges.

The objectives and methodological approaches recommended in Parra et al. (2012) are not exhaustive, but serve as a platform for discussion and to initiate the process that leads to national standards and guidelines for assessing tropical inshore dolphins. Given that it is impossible to monitor snubfin and humpback dolphins throughout their range in Australia to estimate their abundance and how this changes with time (unless substantial funds are committed to a large scale and long-term monitoring programme), it becomes important to set realistic objectives that take into account the logistical and analytical constraints of monitoring these species. Considering this, we have identified six objectives and associated actions that should assist in assessing the conservation status of snubfin and humpback dolphins against the EPBC Act listing criteria. Implicit in these objectives is a hierarchical strategy; examining the patterns of distribution, abundance, population structure and habitat use of snubfin and humpback dolphins at different spatial and temporal scales. We have not set a timeline on these objectives, as this will be highly dependent on funding availability to conduct these tasks. However, we envisage that most of the objectives below could be achieved during the next 10 years. As noted in the introduction, the objectives set out here, and potential methodologies to achieve them, are not set in stone and will need to be discussed and agreed upon among researchers, governmental officials, NGOs, traditional owners and other interested parties. As new issues arise, knowledge increases and new methodologies are developed some of the objectives and actions listed here will need to be revised and updated accordingly.

An underlying premise of successful monitoring programs is that their design is simple and indicator variables are straightforward, unambiguous and replicable. Whilst cost is one of many practical considerations to be taken into account in designing a research strategy for snubfin and humpback dolphins, we need to ensure that the strategy we choose does not "cut corners" in obtaining the information needed, largely in a bid to save on funds, but instead produces the information needed while improving cost-effectiveness in the long-run.

4.5 Sea Ranger program overview
Melissa George

Before beginning her talk, Melissa George, acknowledged the traditional owners of the land on which we met and stated that the Australian Inshore Dolphin Technical Workshop was the first workshop at which indigenous representatives had been brought together with technical experts in the early planning stages of a project such as this.

The Sea Ranger program has its origins in the Northern Territory 'Working on Country' program aimed at managing the region's biodiversity. In November 2011, the Gillard Government announced a $19.1 million jobs package for Indigenous people in remote communities in the Northern Territory, including 50 new ranger positions in an expansion of the highly successful 'Working on Country' program. The 'Working on Country' program provided funding of up to $90 million until 2012/2013 to employ up to 242 full-time equivalent Indigenous rangers in 32 groups across the Northern Territory. Furthermore, eight indigenous protection plans have identified snubfin dolphins (*Orcaella heinsohni*) as a key cultural species.

The capacity of ranger groups to support researchers is invaluable for the snubfin dolphin and for the relationship between the communities and researchers.

For example, Dolphin Research Australia/Liz Hawkins and a Ranger group at Nambucca Heads (Gumma Indigenous Protected Area - IPA) have been working together to develop a research platform using I-Tracker that can funnel information through to the government. http://nailsma.org.au/sites/default/files/publications/KS%20004%202009%20Itracker-report-web.pdf

The method is aimed at generating a place in scientific analysis that incorporates sites of significance and Indigenous Knowledge. I-Tracker allows local knowledge to be collected in a systematic format as there is little published literature that details local knowledge data collection and analysis methods. This process allows implementation of geographic information systems to systemize, analyse and display traditional and scientific information to support indigenous biodiversity protection and management.

An indigenous necropsy training program is also underway.

Of note to the workshop delegates is the fact that Intellectual Property Lawyer, Terri Janke, has written research agreements of the sort that will be required for inshore dolphin researchers to engage with indigenous communities. Terri is happy for them to be made available to the inshore dolphin research community: http://terrijanke.com.au/

Working group discussions held after Melissa's presentation highlighted the need for documentation from this workshop to go to the Indigenous Advisory Committee. The IAC is able to champion and guide the process of indigenous engagement. If the work proposed in the Australian Inshore Dolphin Research Framework is considered to be a priority and is endorsed by the Environment Minister, negotiations could allow Australian inshore dolphins to be included in Sea Ranger work plans and leverage extra Government funds via the 'Working on Country' program.

The working group also discussed the capacity of the Sea Ranger program to deliver data. It was **agreed** that Sea Ranger groups could provide invaluable input to help meet the needs of researchers. However, it was noted by the working group that:

1) An open dialogue would need to be maintained between Sea Rangers and researchers, and thorough training provided (e.g., via workshops), to ensure the provision of clear guidance on what information needs to be delivered;
2) Standardized protocols and applications for I-Tracker would need to be developed and adopted across research projects and regions;
3) Results should be fed back to communities (including schools, documentation in local languages and presentations) in a timely manner to build long-term capacity and strengthen relationships between researchers and Sea Rangers;
4) Sea Ranger groups generally have resources such as boats but research budgets need to take into account the additional costs associated with remote field work, in particular the high cost of fuel and need for fuel caches at remote locations to extend the geographical range that can be surveyed.

The working group **recommended** that an *Indigenous Engagement Strategy* be a focus of the planned Stakeholder Workshop to be held in 2013. It was **agreed** that the World Indigenous Network conference (http://www.worldindigenousnetwork.net/) to be held in Darwin, Northern Territory, 26-31 May 2013, would be an excellent venue for this second workshop.

5. APPROPRIATE CRITERIA FOR LISTING SNUBFIN DOLPHINS

Following the background presentations, the working group **agreed** to restrict discussion at the Technical Workshop and the scope of the workshop products to **the provision of information required to assess the conservation status of Australian snubfin dolphins (*Orcaella heinsohni*)**. Nevertheless, it was noted that the recommendations of the working group are also applicable to Indo-Pacific humpback dolphins (*Sousa chinensis*) and other tropical inshore species because of the similar challenges associated with collecting information about them and their similar life history traits. Therefore, any research conducted on snubfin dolphins under the auspices of the Australian Inshore Dolphin Research Framework should also endeavour to collect information about Indo-Pacific humpbacks and other inshore dolphin species.

Subsequently, the working group discussed the most appropriate criteria for listing snubfin dolphins under the *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act) and *Environment Protection and Biodiversity Conservation Regulations 2000* (EPBC Regulations). Dialogue focused on the feasibility of collecting sound scientific information to meet the requirements of each criterion and led to a prioritized list of criteria and their data requirements for targeted research (Table 1).

Table 1: Prioritised list of criteria

Criterion	Content	Priority
1	A1 – An observed, estimated, inferred or suspected population size reduction over the last 10 years or 3 generations where causes are reversible and understood and ceased.	Low
	A2 – An observed, estimated, inferred or suspected population size reduction over the last 10 years or 3 generations where causes may not be reversible or not understood or not have ceased.	Low
	A3 – A population size reduction projected or suspected to be met within the next 10 years or 3 generations based on: a) Direct observation	**SECONDARY CANDIDATE**

	b) An index of abundance appropriate to the species c) A decline in area of occupancy, extent of occurrence and/or quality of habitat d) Actual or potential levels of exploitation e) The effects of introduced species, hybridization, pathogens, pollutants, competitors or parasites A4 – An observed, estimated, inferred or suspected population size reduction over the last 10 years or 3 generations where time period must include both past and future and where reduction or its causes may not have ceased or may not be understood or may not be reversible.	Low

2	**Precarious geographic distribution based on extent of occurrence < 20,000 km^2 or area of occupancy < 2000km^2 and populations:**
	
	a) Severely fragmented or known to exist at a limited location
	b) Continuing decline, observed, inferred or projected, in any of the following:
	   i. extent of occurrence
	   ii. area of occupancy
	   iii. area, extent and/or quality of habitat
	   iv. number of locations or subpopulations
	   v. number of mature individuals
	c) Extreme fluctuations in any of the following:
	   i. extent of occurrence
	   ii. area of occupancy
	   iii. number of locations or subpopulations
	   iv. number of mature individuals
		TERTIARY CANDIDATE

3	Number of mature individuals very low, low or limited (< 10,000) and **either:**
	
	A1 – Rate of continued decline substantial (10% decline in 10 years or 3 generations).
	or
	A2 – Continued decline **and** geographic distribution is precarious (based on at least two of a-c):
	a) Severely fragmented or known to exist at a limited location.
	b) Continuing decline, observed, inferred or projected, in any of the following:
	
	   i. extent of occurrence
	   ii. area of occupancy
	   iii. area, extent and/or quality of habitat
	   iv. number of locations or subpopulations
	   v. number of mature individuals.
	
	c) Extreme fluctuations in any of the following:
	
	   i. extent of occurrence
	   ii. area of occupancy
	   iii. number of locations or subpopulations
	   iv. number of mature individuals
		Low
		
		PRIMARY CANDIDATE
		
		Low

4	The estimated total number of mature individuals is < 1,000	Low
5	Probability of extinction in the wild	Low

Following extensive discussion, the working group **agreed** that Criterion 3(A1) was the highest priority for targeted research, followed by Criteria 1(A3) and 2, under the EPBC Act.

It was also **agreed** that research conducted within the Australian Inshore Dolphin Research Framework should focus on collecting data to inform an assessment of the status of the snubfin dolphin under these three criteria only.

6. PRIORITISED LIST OF OBJECTIVES AND ACTIONS FOR THE AUSTRALIAN INSHORE DOLPHIN RESEARCH FRAMEWORK

Once the criteria had been prioritised, the working group revisited the six objectives presented in Parra et al. (2012). During lengthy discussions, each was considered and three prioritised objectives plus associated actions and indicative time frames were identified and **agreed** to be necessary to deliver meaningful research in a cost-effective manner to assess the status of snubfin dolphins under the EPBC Act criteria identified above (Table 2).

Overall, the working group **agreed** that there is a need to perform both **broad scale surveys** to elucidate the distribution and occupancy of snubfin dolphins, and **fine-scale studies** to investigate life history parameters and threats at the population level, e.g. displacement and survival.

The prioritised objectives and associated justifications are listed below:

Objective 1 (Objective 1 in Parra et al., 2012). **Conduct a broad-scale assessment of the extent of occurrence and area of occupancy of snubfin dolphins in Australia.**

> Given the huge extent of occurrence and area of occupancy of snubfin dolphins, the working group **agreed** that there is a need to compile existing information (Coast Watch may be able to inform this) and then mount a carefully (statistically) designed, dedicated survey effort that engages indigenous Sea Ranger programs, potentially including the use of I-Tracker. Furthermore, given that aerial surveys are very expensive and unlikely to be useful for determining more that the presence/absence of snubfin dolphins, it was **agreed** that passive acoustic -monitoring (PAM) should be considered alongside boat-based surveys for broad scale assessment of snubfin dolphin occurrence. PAM can give a temporal aspect to presence/ absence/ occupancy and is especially useful in areas where data is currently lacking. However, it needs to be conducted in areas with low levels of ambient noise.

Objective 2 (Objective 5 in Parra et al., 2012). **Estimate the density and abundance of snubfin dolphins across multiple years in key sites across northern Australia (i.e. in Western Australia, Northern Territory and Queensland).**

> It was **agreed** by the working group that deriving an abundance estimate for snubfin dolphins across their range in Australia is unlikely to be feasible. Instead, research should focus on determining whether there are less than 10,000 individuals across Australia, in line with Criterion 3(A1) of the EPBC Act, and forming an order of magnitude notion of total abundance.
>
> Given that, snubfin dolphins appear to occur in relatively small populations with small home ranges (Parra et al., 2012; Beasley et al., 2012b), it is **recommended** that multiple study sites

(= areas to be surveyed) are chosen across different regions within the known area of occupancy, and that these should include impacted and not impacted sites. It is also recommended that paired, adjacent sites are selected, especially where impacts are expected, to allow researchers to infer connectivity between snubfin dolphin populations.

It was **agreed** that this approach would require a robust experimental design, with the advantage that a robust design would reduce the necessary study length. It is likely that at least 15 paired sites would be required across at least 3 regions and 3 impact levels. It was noted that it may be more cost effective to continue research at sites for which snubfin dolphin data already exists (refer to Parra et al. (2012) for a list of sites for which baseline data is available). It was also noted that this approach would require teams of researchers to work collaboratively.

It is **recommended** that a photo-identification mark-recapture approach be employed at selected sites. A significant proportion of time should be devoted to recapturing a mark before using remaining time to photograph associated individuals, due to the bias associated with recapturing animals that have very conspicuous markings/features.

The working group **recommends** the formation of a steering group to oversee the development of a fine-scale, site-specific study and the collection of data in a central repository.

Objective 3 (Objective 3 in Parra et al., 2012). **Undertake a spatial risk assessment of the threatening processes to snubfin dolphins.**

The working group **agreed** that it was important to undertake a spatial assessment of the threats facing snubfin dolphin populations. It was **recommended** that the product of such an assessment should be an overlay map of snubfin dolphin distribution, population trends (e.g. demonstrated design) and current and future coastal developments, informed by, for example, Government reports, Government agencies, details of recent, past and proposed development and leases.

The working group also **recommended** that any assessment include a review of the impacts of gillnet/fishing on snubfin dolphins.

It was noted that it is possible to identify threats to snubfin dolphin populations, but there is currently no quantitative data available on how coastal development impacts dolphin populations. Therefore, collection of information about extent, presence/absence and magnitude of impacts at specific sites is **recommended**. This information will allow sensitivity analyses to be conducted and estimations of 'plausible impact' to be made, and feed into an assessment of snubfin dolphin conservation status under Criterion 1(A3) of the EPBC Act.

The working group also **recommended** that all agencies involved in managing the Australian coastline should be encouraged to collate spatial information about coastal development because the impacts of such development reach far beyond snubfin dolphins.

The remaining objectives identified by Parra et al. (2012) that were not considered to be high priorities for directly assessing the prioritised listing criteria were:

To identify and define potential snubfin and humpback dolphin habitats and 'hot spots' at a state and national level.

The working group felt that research that will derive information about dolphin habitat and potential 'hotspots' is already embedded in the prioritised broad- and fine-scale studies described above (Objectives 1 and 2 of the Inshore Dolphin Research Framework). It was not, therefore, considered necessary to include an additional, focused objective within the proposed Inshore Dolphin Research Framework.

To assess the genetic population structure of snubfin and humpback dolphins at a state and national level.

The working group felt that an assessment of the genetic population structure of snubfin (and humpback) dolphins was not a priority because such information would not contribute directly to assessing the conservation status of snubfin dolphins under the EPBC Act. Potentially such studies could be conducted in an opportunistic manner via the higher priority objectives.

To improve the retrieval and necropsy of dead stranded and by-caught specimens for the collection of data and samples for life history studies.

The collection of information from necropsies was not considered to be high priority by the working group in this context. However, necropsy information (from strandings) could be collected to determine female age at first reproduction and other life history parameters helpful in addressing prioritised Objective 2. It was also noted that an indigenous necropsy training program is underway as part of the Sea Ranger Program and traditional owners should be acknowledged.

7. **THE NEXT STEPS – TOWARD FINALISING THE AUSTRALIAN INSHORE DOLPHIN RESEARCH FRAMEWORK**

It was **agreed** by the working group that the Australian Inshore Dolphin Research Framework would stimulate and guide coordinated research to address the knowledge gaps that currently hamper a meaningful assessment of the conservation status of Australian tropical inshore dolphins, in particular snubfin dolphins, under the EPBC Act.

It was **recommended** that the Australian Inshore Dolphin Research Framework include:

1) A brief summary of current knowledge;

2) Recommendations and explanations for the most appropriate criteria in the *Environment Protection and Biodiversity Conservation (EPBC) Act (2010)* under which to assess the conservation status of Australian snubfin dolphins (*Orcaella heinsohni*).

3) A recommended list of scientific objectives matched against these criteria and associated explanations;

4) Recommended actions linked to methodologies and statistical approaches, including indicative timelines;

5) Indicative costs associated with conducting research to address each prioritised objective;

6) Recommendations for implementation of the Research Framework, including the key actions required.

It was **agreed** by the working group that the *key actions* within Australian Inshore Dolphin Research Framework were:

- The formation of a small working group to further develop the specific methodologies, statistical approach and survey designs required to meet each of these objectives. The methods will ultimately inform the final budget, timelines and logistics of research proposed within the Research Framework;

- Holding a second, broader Stakeholder Workshop that will:

  o Provide final endorsement of the Research Framework;

  o Examine some of the practicalities of implementing the actions identified in the Research Framework, e.g., accessibility of field sites and support services;

  o Provide cost estimates for each stated action in the Research Framework. The working group gave brief consideration to the costs associated with each of the prioritised objectives within the Research Framework (Table 3). These require detailed refinement based on methodological development and stakeholder engagement;

  o Agree on a strategy to implement the Australian Inshore Dolphin Research Framework;

  o Determine how the knowledge and skills found in coastal indigenous communities can be utilised to achieve the objectives of the Research Framework, including the involvement of indigenous people, fishers and tourist operators and the potential use of platforms and technologies such as I-Tracker; and subsequently inform the

- Development of an *Indigenous Engagement Strategy* in consultation with representatives of the Indigenous Advisory Council (IAC), Ranger groups and other stakeholders;

- Development of a *Project Coordination and Data Management Strategy* which includes but is not limited to;
  o Cultural protocols and research agreements (as part of an *Indigenous Engagement Strategy*)
  o Formation of a steering group
  o Communication protocols
  o Broad data availability (including metadata)
  o Creation of a centralised data repository
  o Standardised protocols, e.g. for photo-identification, scar-ID, biopsies
  o Development of research agreements

Table 3: Indicative costs for prioritised objectives

Objective	Items	Cost (AUD)

1 – **Conduct a broad scale assessment of the distribution of snubfin dolphins in Australia**	Existing data and ongoing programmes Collecting new data (5 year research effort) Start up planning and documents: • Indigenous Engagement Strategy • Centralised data repository (basic; photo ID and survey) • Centralised data repository (sophisticated including online photo ID catalogue) • Annual meeting of steering group	100,000 5 million 30,000 60,000 700,000 30,000
2 – **Abundance and demography at selected sites**	• 18 days, two boats, twice per annum, 3 personnel per boat for a minimum of 12-15 sites over 5 years	200,000 per year per site
3 – **Undertake a spatial assessment of the threatening processes and risks to snubfin and humpback dolphins**	• Desk exercise, 1 person over 1 year	100,000

8. IMPLEMENTATION OF THE AUSTRALIAN INSHORE DOLPHIN RESEARCH FRAMEWORK

The working group **agreed** that in order to successfully implement the Australian Inshore Dolphin Research Framework it is imperative that researchers across institutions and disciplines collaborate and share information. The scope of the Research Framework is such that that no one researcher or group could deliver the outcomes in their entirety. Good collaboration and coordination will ensure protocols are standardised, data collection is consistent and information is freely disseminated, thereby allowing a consolidated analysis and meaningful assessment of snubfin dolphins across their range. The development of a *Project Coordination and Data Management Strategy*, as recommended as a key action of the Research Framework, will be imperative for ensuring its successful implementation.

Table 2: Draft research strategy objectives, actions to address research objectives, priorities and indicative timeframes

Objective	Purpose and Actions	Priority	Timeframe
1 – Conduct a broad scale assessment of the distribution of snubfin dolphins in Australia	**Purpose** Assess existing information and conduct new boat-based surveys that will provide information on the areas where sightings are consistently high and where sightings are consistently low. **Actions** Development of survey plan which includes: • Compilation and deposit of existing data for survey design • Assessment/review of existing and ongoing programs (Sea Ranger surveys, I-tracker) • Assessment/review of survey techniques including new technologies (e.g. Passive Acoustic Monitoring (PAM))	1	3 - 5 years
2 – Abundance and demography at selected sites	**Purpose** • In combination with Objective 1's broad scale surveys, provide an order of magnitude of total abundance estimate for the Australian extent of snubfin dolphin individuals (NB: No intention to deliver a precise abundance estimate of mature individuals across entire range). • Provide a plausible estimate of rate of change within sites and by extension, across the entire range **Actions** Development of a survey long-term plan which includes: • The nature of site based surveys, i.e. photo ID, mark-recapture • A review of the merits of alternative approaches, including robust design with assessment of indicative timelines and efforts • Study sites/areas (maybe influenced by distribution of developments and funding) • Impacted as well as non-impacted sites • Adjacent regions/groups (paired sites) to assess connectivity and movement • Representative habitat differences: e.g. Pilbara, Kimberley, Gulf, East coast. • Consideration of the most efficient approach to collect the most informative data including continuation of existing studies • Sites where it is already known that dolphin sightings are frequent, including those where large developments are planned (see also Objective 3) • Continuation of existing studies (for cost-effectiveness) • Baseline data prior to impacts	2	5 - 8 years

3 – Undertake a spatial assessment of the threatening processes and risks to snubfin dolphins	**Purpose** Deliver an assessment of projected/continuing decline in abundance **Action** • Desk study to identify areas of Australian inshore dolphin habitat likely to be impacted by threatening processes. NB: Threatening processes include but are not limited to, coastal development, port development and coastal/undersea mining (includes habitat modification, noise, water quality) impacts. • Review evidence, extent (map) and effort of fisheries (gill and shark nets) impact on snubfin dolphins and/or sensitivity analysis • Review the evidence of vessel strike impact or risk to snubfin dolphins and/or sensitivity analysis.	3	1 year

9. PREPARATION OF THE WORKSHOP REPORT AND RESEARCH FRAMEWORK DOCUMENTS

It was **agreed** that the report of the workshop and the Australian Inshore Dolphin Research Framework document be revised and agreed by email. The workshop report and Research Framework will be published on both the DSEWPaC website and the Australian Marine Mammal Centre's website: www.marinemammals.gov.au

10. CONCLUDING REMARKS

The Chair thanked all participants for their valuable contributions, Elanor Bell for her assistance organising the workshop, and both Virginia Andrews-Goff and Elanor Bell for rapporteuring. The working group thanked the Chair for his skill in handling the debate and ensuring a positive outcome.

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APPENDIX 2 – AGENDA

DAY 1 - 10 December 2012

08:30 Tea and coffee available in Greenvale Room

09:00 Introduction by chair, housekeeping, appointment of rapporteur (Rob Harcourt)
09:05 Scope of workshop and final product – refer back to terms of reference (Rob Harcourt)
09:15 Background and recent history of the project (Sylvana Maas)
09:25 EPBC Act listing processes (including challenges of listing data deficient species; Andrea Taylor)

10:30-11:00 Morning tea

11:00 Appropriate criteria for listing snubfin dolphins (Andrea Taylor/Isabel Beasley)
12:15 Summary of criteria – synthesis from snubfin and other species (Rob Harcourt)

12:30-13:30 Lunch

13:30 Presentation of the '*Draft coordinated research strategy to collect information required to assess the national conservation status of Australian tropical inshore dolphins*' (Guido Parra)
14:30 Matching actions and objectives to identified criteria: the way forward (Rob Harcourt)

15:00-15:30 Afternoon tea

15:30 30 Matching actions and objectives to identified criteria: the way forward cont.... (Rob Harcourt)
16:45 Decide on Agenda for Day 2
17:00 Close

18:30 Workshop dinner in Mickleham Room

DAY 2 - 11 December 2012

08:30 Tea and coffee available in Greenvale Room

09:00 Introduction by chair (Rob Harcourt)
09:05 Sea Ranger overview (Melissa George)
10:05 End point of the day (Rob Harcourt)
- prioritised list of criteria, objectives, associated research strategies
- methodological approach
- scale
- intensity
- effort
- statistical approach
- data recommendations
- timelines
- indicative budgets

10:30-11:00 Morning tea

11:00 Target of objectives and how they deliver on criteria, i.e. nature of objectives, methodology, effort
11:30 Match actions to objectives
12:00 Determine methods to deliver actions (including statistical approach)

12:30-13:00 Lunch

13:00 Further points of discussion:
- timelines
- indicative budgets
- collaborative framework

15:30-15.45 Afternoon tea

15:45 Finalising framework research strategy
16:30 Stakeholder workshop planning – dates, attendees, scope, objectives

17:00 Close

APPENDIX 3 – MEETING DOCUMENTS

DSEWPaC commissioned reports and guidelines

Guidelines for assessing the conservation status of native species according to the *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act) and *EPBC Regulations 2000*.

Beasley, I., Allen, S., Parra and G.J. 2012a. Review of Australian snubfin dolphin nomination for listing as threatened species under the EPBC Act. Final report to DSEWPaC.

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Parra, G.J., Beasley, I., Allen, S., Brooks, L. and Pollock, K.H. 2012. Draft coordinated research strategy to collect information required to assess the national conservation status of Australian topical inshore dolphins. Report to DSEWPaC.

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Palmer, C. 2008. Ecology of the Australian Snubfin *Orcaella heinsohni* and Indo-Pacific Humpback *Sousa chinensis* dolphins in Kakadu National Park. Interim report to the natural and cultural Kakadu National Park. Department of Natural Resources Environment and the Arts Biodiversity Conservation Division, 16 pp.

Palmer, C. 2010. Interim Report: Darwin Harbour Coastal Dolphin Project. Department of Natural Resources, Environment and the Arts (NRETAS), 16 pp.

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Frère, C.H., Hale, P.T., Porter, L., Cockcroft, V.G. and Dalebout, M.L. 2008. Phylogenetic analysis of mtDNA sequences suggests revision of humpback dolphin (*Sousa* spp.) taxonomy is needed. Marine and Freshwater Research 59: 259-268.

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