



# Plan of Management for the Niue Whale Sanctuary



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# **Part A - Basis for Management**

## **Introduction**

Niue Island is situated north east of New Zealand in the central South Pacific Ocean. The island is the largest raised coralline atoll in the world at 19°02' S, 169°55'W, which is surrounded by a fringing coral reef that supports a diversity of marine species, some of which are endemic. The island appears to represent important habitat for wintering humpback whales, a resident group of spinner dolphins, and anecdotal sightings data suggest, is frequented by many other cetacean species including pilot, sperm and minke whales.

Many species of large whales found in Niue were critically impacted by commercial whaling during the nineteenth and twentieth centuries by countries outside the region, which has reduced the breeding populations of South Pacific whales to extremely low levels. Most of these species have a distribution and migratory pathways that extend across several jurisdictions, thus Pacific Islands have a shared responsibility to ensure the maintenance of viable populations of migratory marine species, including under the provisions of various international agreements such as CBD, CMS and CITES.

The Niuean people have strong links to the sea and place high value on the protection and management of marine mammals found in Niuean waters and as such, in May 2002, Niue formally declared the waters of its Territorial Seas a whale sanctuary to complement existing fisheries legislation. This Plan of Management for the Niue Whale Sanctuary aims to:

- Identify priorities for cetacean management according to issues, linking mechanisms and administrative structures;
- Recommend actions to mitigate potential threats to sanctuary values;
- Identify priority research and development needs

## **Vision**

Acknowledging the Niuean people's traditional respect for whales and dolphins, we envision a sanctuary for cetaceans where populations have recovered to healthy levels of

abundance, and where people and cetaceans benefit mutually from sharing Niue's unique marine environment.

## **Management Objectives**

- Manage the sanctuary with respect to the cultural values and aspirations of Niuean people
- Conserve and protect the sanctuary's cetaceans, particularly those of vulnerable status and, or of regional significance
- Promote understanding of cetaceans and the sanctuary's cultural and environmental significance
- Minimise the effects of human use on the conservation values of the sanctuary, while providing for recreational and commercial uses

## **National Legislative and Management Framework**

- **Niue Whale Sanctuary Regulations 2003 (see Appendix 1)**

The Niue Whale Sanctuary is established in order to give formal recognition of the high level of protection already afforded to cetaceans in marine waters of the jurisdiction of Niue in accordance with international law.

- **Niue Domestic Fishing Act 1995: Domestic Fishing Regulations 1996**

All species of cetaceans have been protected in Niuean waters as 'protected fish species' under the *Domestic Fishing Regulations 1996*, pursuant to the *Domestic Fishing Act 1995* and as outlined in the *1997 Territorial Sea and Exclusive Economic Zone Act*

- **Territorial Seas and EEZ ACT 1997**

The Niue Whale Sanctuary comprises the waters of the 390,000 square kilometre exclusive economic zone, the territorial seas and the internal waters as defined in the *Territorial Seas and Exclusive Economic Zone Act 1997*. This Act affirms the sovereign rights of Niue to make provisions for the conservation and management of the resources within the zone.

- **Niue National Biodiversity Strategy and Action Plan (NBSAP) 2001**

Reinforces that all marine mammals are protected in Niue and nominates the International Whaling Commission as a convention relevant to biodiversity conservation, as well as SPREP, CITIES and UNCLOS.

- **Niue National Environment Management Strategy (NEMS) 1992**

- **Niue Environment Act 2003**
- **Niue Tourism Strategy (in development)**
- **Marine Pollution Act 1975**

These provisions are the collective responsibility of these, and a number of other departments:

- Department of Agriculture, Forests and Fisheries (DAFF)
- Department of Environment
- Department of Justice, Lands and Survey
- Niue Tourism Office

### **Regional Context: Action Plans, Conventions and Linking Mechanisms Relevant to Cetacean Conservation in Niue**

- **Secretariat for the Pacific Regional Environment Programme (SPREP) Whale and Dolphin Action Plan (WDAP)**  
This action plan has been a key resource in developing the document present herein as it was developed with the participation and endorsement of the Niuean, and 20 other Pacific island Governments
- **SPREP Plan of Action and Priorities for Research to Reduce Depredation on Long-lines by Cetaceans**  
Contains specific best practice guidelines for reducing depredation which are of particular pertinence to Niue at this time with the development of a substantial long-line industry
- **SPREP Action Plan for Managing the Environment of the Pacific Islands Region 2001 – 2004**  
Encourages member states to increase protection of marine mammal species of local, regional, and international significance through strategies and management plans and also has aims for sustainable tourism through training and best practice guidelines
- **SPREP International Waters Project (IWP)**
- **NZ Department of Conservation Marine Mammal Action Plan for 2005–2010**  
As Niue is in free association with NZ, this action plan is also a key guiding resource for the plan presented herein
- **SPC – South Pacific Commission**

- **CMS – Convention on Migratory Species**

A Memorandum of Understanding is in development for the conservation of marine mammals in the SPREP region, under CMS. At the second workshop on the Convention on Migratory Species (CMS) & Marine Mammal Conservation in the South Pacific, March 2004, Niue announced its intention to join the convention.

- **CBD – Convention on Biological Diversity (Niue ratified in 1996)**

Niue's NBSAP is part of their responsibilities under the CBD convention

- **SPWRC – South Pacific Whale Research Consortium**

Some vessel-based surveys by the Consortium in Tonga have included opportunistic photo identification of humpbacks in Niue waters on the return journey.

- **UNEP Global Marine Mammal Action Plan**

- **IUCN – International Union for the Conservation of Nature**

Several marine mammal species found in, and likely to be found in Niue are listed under the IUCN Red List of Threatened Species

- **CITIES – Convention on International Trade in Endangered Species**

In addition to the *Domestic Fisheries Regulations 1996*, CITIES prohibits the import or export of cetacean products

## **Consultation**

In March 2005, a stakeholder consultation process was facilitated in Niue focusing on what values and concerns stakeholders have for whales & dolphins as a first step to developing this plan of management. A series of points and questions were offered to participants at each consultation meeting in order to brainstorm: issues and possible solutions, a framework for management - vision, management goals, key outcomes/deliverable's, resources required, linkages with other Niuean and regional cetacean issues. This consultation has formed the basis on which the plan has been developed. During this process the draft Guidelines for Cetacean Interactions in Niue were reviewed for inclusion in the Niue Whale Sanctuary Regulations. Stakeholder groups consulted for this plan include:

- Department of Agriculture, Forestry and Fisheries (DAFF)
- Niue Tourism
- Niue Environment Department
- NZ High Commission
- Taoga Niue Cultural Association

- Reef Shipping
- Tourism Operators
- Vaka Association (Traditional Fishing Canoe)
- SPREP International Waters Project
- Sport Fishing Association
- Niue Yacht Club

## **Part B – Cultural Heritage**

Many Pacific island cultures have legends, stories and traditional interactions with marine mammals, indicating an importance of these creatures in the identities of people, their way of life and their heritage (SPREP, 2003). Whales are considered ‘Tapu’ or sacred in Niue due to legends attached to their contribution to Niuean society. Niuean people do not have a history of eating whales or dolphins like their Pacific neighbours in Tonga, and, though Niueans have a long history of going to sea, there is no history of whaling

The most well documented legend about whales in Niue is the story of Matalingi Fale – a Niuean midwife from Avatele who went to Tonga in the mouth of a whale and became the first female doctor in Tonga, teaching midwifery. There are strong links between whales and pregnant women and birth in Niue. Mother/calf pods of dolphins and whales are considered a sign of good luck, health and fertility if observed by pregnant women. Though some stories or legends such as these are documented, there is a lack of community traditional knowledge about the relationship between Niueans and cetaceans.

### **Recommendations**

1. Research on traditional values associated with cetaceans is needed. This could be carried out by Taoga Niue, Village Councils, and Department of Community Affairs. This work is in line with regional priorities as documenting the cultural significance of cetaceans is Action 1 of the SPREP WDAP
2. Development of an annual Tafuā festival to get community involved in sharing and celebrating of traditional knowledge of cetaceans

## **Part C – Natural Heritage**

### **Cetaceans in Niue**

Though no dedicated marine mammal surveys have been conducted in Niue's waters, anecdotal information and broader scientific studies suggests that up to 25 cetacean species may occur here. Most of what is known of baleen whales (Mystecetes) and sperm whales in the Oceania region comes from historical whaling data (Townsend, 1935; Dawbin, 1964). Smaller toothed whale species have been described in Reeves *et al*, (1999) by non-systematic surveys. Of the known species present in Niue, from sightings and stranding events, both sperm and humpback whales are listed by the IUCN as Vulnerable (IUCN, 2003). The island of Niue may represent critical habitat for these whales, whose populations were subject to commercial exploitation this century.

As Niue is surrounded by deep water on all sides it is possible that particular deep diving species such as beaked whales may be present, and may possibly be encountered within a few miles of Niue's coast. Of the mysticetes, the Bryde's whale is the only species found in the tropical waters year round. Other species such as the humpback, blue, sei, fin and minke whale migrate to tropical regions seasonally. Species that have been recorded in Niue, or in the waters of neighbouring counties, or, from historical records, are likely to be present in Niue are listed in Table 1.

During the last century, the Humpbacks of the Southern Hemisphere have been reduced to less than 10% of their original populations by commercial whaling (Donoghue and Baker, 2000). Recovery in the abundance of humpback whales in Oceania has been slow and variable. Correspondingly, sightings remain rare around several island groups where they were once common, such as Niue. The great majority of islands in Oceania have never been surveyed for the presence of humpback whales, and their use of most of the potentially available habitat is therefore unknown (Guarrigue *et al*, 2001).

### **Research**

The long term research projects of the South Pacific Whale Research Consortium (SPWRC) in New Caledonia, Tonga, Cook Islands, and French Polynesia has identified that there is interchange between Group V and Group V1 humpback whales of the



eastern and western south pacific ocean. These findings highlight that these whales do not show fidelity to specific breeding grounds, and confirm the interconnectedness of whales across the region, which is building the case to ensure that protection measures such as sanctuaries are consistent across their range.

As Niue is directly between Cook Islands, Samoa and Tonga it is uncertain whether humpback whales that migrate to Niue are more genetically related to the eastern or western pacific populations. One of only 2 individual humpback whales photo identified in Niue has been matched to the Cook Islands in a previous year, which could represent a significant link.

### **Table 1.**

List of cetacean species reported, or likely to be present in the waters of Niue

“R” Indicates the species has been recorded.

“L” Indicates the species has not been recorded but is likely to be present.

<b>Common Name</b>	<b>Species</b>	<b>Niue</b>
Blue whale	<i>Balaenoptera musculus</i>	L
Humpback whale	<i>Megaptera novaeangliae</i>	R
Bryde’s whale	<i>Balaenoptera edeni</i>	L
Sei whale	<i>Balaenoptera borealis</i>	L
Fin whale	<i>Balaenoptera physalus</i>	L
Antarctic Minke Whale	<i>Balenoptera acutorostrata</i>	L
Dwarf Minke whale	<i>Balaenoptera bonaerensis</i>	R
Sperm whale	<i>Physeter macrocephalus</i>	R
Dwarf Sperm Whale	<i>Kogia simus</i>	L
Pygmy Sperm Whale	<i>Kogia breviceps</i>	L
Killer whale	<i>Orcinus orca</i>	L
False killer whale	<i>Pseudorca crassidens</i>	L
Pygmy killer whale	<i>Feresa attenuata</i>	L
Short-finned pilot whale	<i>Globicephala macrorhynchus</i>	R
Bottlenose dolphin	<i>Tursiops truncatus</i>	L
Common dolphin	<i>Delphinus delphis</i>	L
Spinner dolphin	<i>Stenella longirostris</i>	R
Pantropical spotted dolphin	<i>Stenella attenuata</i>	L
Striped dolphin	<i>Stenella coeruleoalba</i>	L
Melon-headed whale	<i>Peponocephala electra</i>	L
Risso’s dolphin	<i>Grampus griseus</i>	L
Fraser’s dolphin	<i>Lagenodelphis hosei</i>	L
Rough-toothed dolphin	<i>Steno bredanensis</i>	L
Cuvier’s beaked whale	<i>Ziphius cavirostris</i>	L
Blainville’s beaked whale	<i>Mesoplodon densirostris</i>	L

The SPREP Whale and Dolphin Action Plan, recommends that baseline cetacean surveys be initiated in the region to develop species inventories and identify species and habitat

of conservation concern. It also advocates expansion of existing research programs to include areas not previously covered such as Niue and encourages the inclusion of local capacity where possible.

The second workshop on the Convention on Migratory Species (CMS) & Marine Mammal Conservation in the South Pacific also noted that the lack of adequate data and scientific knowledge of cetaceans in the region is a major concern. And consequently, the development of an inventory of cetacean species for each country is a top priority.

Niue's NBSAP Theme 3 - Marine Biodiversity, Action 1.6 and 1.7 offers links to existing MPA's for monitoring and identifies the need for research on marine species and assessment of their status, particularly those of commercial and environmental indicator values, which cetaceans represent.

This plan identifies the need for scientific research to identify cetacean species present, and their abundance and distribution in Niue waters. This information is needed for the development of management strategies such as zoning, seasonal closures, tourism regulations and fishing regulations, which are needed for better protection and management of cetaceans within the sanctuary, particularly species of conservation concern such as humpback whales.

## **Recommendations**

1. Undertake baseline research to identify a cetacean species list for the Territorial seas of Niue
2. Combine visual and acoustic surveys to generate abundance estimates for cetacean species identified in Niue waters
3. Combine visual and acoustic surveys to define the distribution and hence areas of critical habitat for cetaceans in Niue waters
4. Generate a photo ID catalogue of individual humpback whales in Niue for comparison with SPWRC catalogues
5. Collaborate with SPWRC to identify the genetic relatedness of humpback whales in Niue to other populations in the south pacific region through opportunistic collection of skin

6. Development of a sightings database and an species ID form/data sheet for whale watching operators, fishers and general public to participate

This work can be achieved through collaboration between Niue Fisheries DAFF, Department of Environment, NGO's such as Whales Alive and IFAW, SPWRC and regional universities. A research proposal to address these recommendations developed by Whales Alive is outlined in Appendix 3.

## **Part D – Issues and Actions**

### **Whale Watching Tourism**

As the population of humpback whales wintering in Niue grows, so too does the interest and potential for whale watching tourism. Open ocean conditions and difficulty in launching boats of size into the sea however, largely dictates the feasibility of such activities and it is likely that the industry will not grow substantially, converse of the case in Tonga.

In 1998, Niue Tourism commissioned a report on the potential for Whale, dolphin and turtle watching tourism activities in Niue (Constantine, 1998). The report outlined the feasibility of such activities and made recommendations for the development of whale watching guidelines, ongoing operator training and public education. It identified IFAW and Whales Alive as the most appropriate organisations to assist these objectives.

In September 2001, at the invitation of the Niuean Government, IFAW and Whales Alive facilitated a National Whale Watching workshop. The workshop assessed best practice and lessons learned from whale watching activities around the pacific region. This workshop brought key stakeholders from Government and industry together over 3 days to create a vision for whale watching in Niue, which included regulation of the developing industry.

In 2003 IFAW and Whales Alive facilitated the 2<sup>nd</sup> National Whale Watching Workshop which, saw the participants from Government, industry and community, develop Guidelines for Interactions with Cetaceans in Niue, reverent to the local, natural and cultural conditions. The workshop participants stipulated aims, responsibilities and

timeframes for the implementation of the guidelines and operator licensing system. It was suggested here that the number of potential commercial whale watching boats should be capped at 6 to cover, and be limited to existing operations.

These guidelines were reviewed as part of the consultation in March 2005 for this plan and a whale watching management and detailed permit/licensing framework was developed by Niue Fisheries DAFF and IFAW to form the Draft Niue Whale Watching Regulations (See Appendix 2). These share themes with the NZ whale watching regulations and aim to be legislated as an appendage to the *Niue Whale Sanctuary Regulations 2003*, which make reference to activities authorised by a permit and in accordance with the conditions of the permit.

Capacity of Niue Fisheries to enforce and monitor private and commercial whale watching operations is limited. As such it is essential that operator training and education of private boaters to operate to the guidelines be conducted to maximise awareness before whale watchers take to sea. Thus support from Department of Environment, Niue Tourism and Customs with capacity for this purpose is needed.

As Niue is one of only three places in the world where swimming with large whales is permitted (Tonga, Caribbean), there is a need to heed the precautionary principal as the industry grows. To date there is no research in the world that documents the impacts of swimming with whales. Cetaceans react in various ways to noise and other aspects of human presence and respond by changing behaviour or physiology (IFAW, 1996). Studies of the impacts of whale watching on cetaceans (Beijder 2004) have documented reductions in reproductive success, recruitment and long-term shifts away from critical habitat. As it is possible that humpback whales are calving in coastal waters of Niue, this plan suggests that additional caution must be exercised with regard to vessel based and swimming operations involving mother/calf pods.

Consultation determined that Vaka fishermen and whales have a traditional relationship of respect and as, Vaka have little impact on whales activities, whale watching guidelines reflect that Vaka may continue their activities in the vicinity of whales. To further reduce possible conflicts commercial whale watching operations are excluded from watching whales where Vaka are operating.

A re-occurring theme in the consultation for this plan regarding whale watching was the qualifications of skippers and guides, and the need for a tiered approach to safety and insurance requirements for boat based, as opposed to in water whale watching operations. The Niue Whale Watching Regulations Draft 2005 reflects this.

Further to the conditions noted in the *Niue Whale Sanctuary Regulations 2003* regarding possession of cetaceans, consultation for this plan identified that captivity of cetaceans for aquaria and/ or tourism is not supported.

Due to the unique sea scape that Niue offers from it's high cliffs and that nature of both humpback whales and spinner dolphins to travel close to the reef edge, the potential for land-based whale watching high and should be encouraged.

## **Recommendations**

1. Endorsement and legislation of the Niue Whale Watching Regulations including licensing provisions and whale watching guidelines as an addition to the *Niue Whale Sanctuary Regulations 2003*
2. To protect the uniqueness of Niue's industry initial licenses should be capped to 6 boats with capacity specified in license eg size of vessel, number of vessels per license
3. If it is not feasible for Fisheries and/or Environment Department to operate a monitoring vessel during whale season, Fisheries and Environment Officers should regularly board commercial whale watching operations to promote the presence of enforcement bodies and assess directly adherence to guidelines and licence conditions
4. Funds attained from fees of special interest permits and whale watching licences to go directly into monitoring and enforcement of whale watching industry and implementing the sanctuary management plan
5. Visiting tourism groups with the purpose of swimming with whales should have compulsory briefing from Fisheries on whales and whale watching guidelines
6. Information on the whale watching guidelines, the whale sanctuary, fines should be disseminated to private boaters through Customs/Immigration liaison at the wharf and through Niue Yacht Club

## **Fisheries Interactions**

Despite the simplistic argument by some nations outside of the Pacific Islands region that the consumption of fisheries by whales is the cause of the crisis facing many of the world's fisheries; it is over-capacity in fishing fleets and consequent over-fishing that has resulted in 75% of the world's fisheries being classified as fully or over-exploited (FAO, 2000).

Baleen whales migrate for the purpose of feeding to the Antarctic where they consume 90% of their annual prey intake. The bulk of the prey consumed by baleen whales is zooplankton, such as krill, which do not occur in tropical waters. Some whale species are known to ingest small fish but most of the species ingested by whales are not those fish species important to commercial fisheries such as tunas.

While there is no evidence of any impact on commercial fisheries in the Pacific by large whales (toothed or baleen), smaller toothed whales are known to sometimes take hooked fish from tuna long-line vessels, a behaviour called 'depredation.' With the rapid growth of domestic long-line fisheries in the South Pacific, reports of these interactions have increased in recent years.

Research conducted by the Secretariat for the Pacific Community (SPC) has estimated that the impact of depredation by whales on hooked fish in the region is relatively minor (0.8%), and is significantly less than the impact of depredation by sharks (2.1%) (Young, 2000).

SPREP has played a leading role in assessing the problem of depredation and in developing a programme to mitigate adverse impacts on fishers in the Pacific. This has included hosting the first international workshop specifically concerned with this issue, which saw agreement on a Best Practice protocol for addressing the problem of depredation (See Appendix 4). As a SPREP member, Niue has a responsibility to implement these protocols.

Niue's NBSAP Marine Biodiversity Objective 2 is to minimise the impact of target fishing on the marine environment and non-target, associated and/or dependent species.

Consultation with Reef on this issue has confirmed that the Niuean long-lining fleet will comply with SPREP best Practice guidelines.

The Government of Niue is subsidising 3 observers from SPC to work on a fleet of 10 (potentially 34) long-lining vessels in Niuean waters. Consultation for this plan identified concerns for the small observer program and lack of potential for collection of by-catch data. SPC data-sheets do include information on cetacean sightings/by-catch however, ability of observers to identify species is limited.

### **Recommendations**

1. All commercial fishing vessels to fill in Niue Fisheries species identification and sightings sheet as well as SPC by-catch data sheets as a licence requirement
2. Adherence to SPREP best practice guidelines should be a licence requirement
3. Observer effort on fishing vessels should be amplified to 1 in every 3 boats operating, thus as industry grows, more observers are employed
4. Observers should carry a camera to document cetacean encounters. Support should be sought from SPREP, DOC NZ, and IFAW for this initiative.

### **Strandings and Entanglement**

Entanglement of cetaceans in fishing gear does not appear to be a significant problem in the region, however as the number of whales increase in near shore waters, the possibility of entanglement in fish attracting devices (FAD'S), fish traps and nets also increases.

Baleen whales such as humpbacks do not use echolocation to navigate. Although they have reasonably good eyesight, it is unlikely that they may be able to detect fishing gear or structures from a distance. The risk of entanglement is greater for larger baleen whales than toothed whales and it is also noted that calves and juveniles are more likely to become entangled than adults. Potential impacts of entanglement are chronic injuries and infection, reduced mobility, which may affect ability to feed, breed or care for offspring, and increased potential for predation.

There have been several stranding incidents of cetaceans in Niue in past years including that of a humpback whale calf and a sperm whale. The jagged and steep nature of the limestone coastline and fringing reef prescribes that a successful rescue is not likely possible, as the animal, once impaled on the reef, will have serious injuries and getting it back across the reef to deeper water would likely maim it further. The issue of how to

rescue a live stranded animal is not so applicable in Niue, however there is a need to develop a national approach to taking and preserving samples from dead animals from stranding incidents. A response team for stranding and entanglement events, coordinated by Fisheries, could include Environment, Tourism, Industry, NGO's and IGO's such as IWP.

Australia's Department of Environment and Heritage (DEH) and IFAW have recently hosted a series of workshops to develop a national approach to marine mammal strandings, which could provide a useful model.

### **Recommendations**

1. Investigate support from SPREP, DEC Australia, and DOC NZ under Action 16 of SPREP WDAP to develop a standard operating procedure for autopsy and sampling of stranded marine mammals in the South Pacific

### **Environmental Factors**

Due to the isolated nature of Niue Island, and the fact that there are no rivers and fresh water run-off is limited to ground water seeps, water quality factors such as pollution, eutrophication and sedimentation usually associated with run-off are not a significant problem. Other factors responsible for habitat degradation and noise, such as harbours are also not applicable in Niue. Natural factors such as climate change, cyclone frequency, and water temperature may pose more of an influence on the migratory regime or habitat use of cetaceans in Niue.

Anecdotal information suggests that humpback whales associate with known fresh water seeps and run-off points around the coast of Niue.

### **Recommendations**

1. IWP and village councils could conduct local water quality testing program to generate information on possible pollutants, contaminants, turbidity and hardness of fresh water seeps.

### **Training and Capacity Building**

Niue's association with NZ provides links through the Strength and Cooperation Program for capacity building. As well SPREP partner organisations such as IFAW and Whales Alive have shared responsibility to implement the actions of the SPREP WDAP, of which, action 10 is to support the development of management plans to foster



research, education, awareness and capacity building for those countries that have declared whale sanctuaries. In this way it may be possible to leverage support and resources from partner governments, SPREP, and partner NGO's to support capacity building and training in Niue.

### **Recommendations**

2. To build qualifications of skippers, support should be sought from NZODA to run the NZ boat launchmans licence training in Niue once a year for local skippers. And to train a trainer on the island in senior first aid to facilitate skill building and capacity of local whale watching skippers and guides in safety.
3. Support should be sought from Whales Alive and IFAW to build capacity and resources within the departments of Fisheries, Environment and Tourism such that officers are empowered to conduct mandatory training sessions for whale watching operators and their crew as per the Draft Niue Whale Watching Regulations 2005
4. Fisheries and Environment should conduct an annual training/briefing regarding cetaceans and the whale sanctuary for the fishing community particularly targeted at the commercial long-line fleet including Reef and village boats
5. Investigate support from SPREP, DEC Australia, and DOC NZ under Action 16 of SPREP WDAP to deliver training to a local response team on standard operating procedure for autopsy and sampling of stranded marine mammals

### **Public Education**

Education has become an essential strategy for governments and many local and international organisations in protecting the environment. Environmental interpretation aims to increase awareness and knowledge on the environment among visitors enabling people to act responsibly and reduce their impact within protected areas and make wiser decisions on nature conservation.

Niue receives several hundred visitors per year. Combined with the unique natural and cultural heritage of the Niue's Whale Sanctuary, this not only makes an excellent platform for an interpretive program but also highlights the need for education as a key management tool. An education plan for the Sanctuary will increase the quality of visitor experience, and community stewardship, accomplish management goals by guiding appropriate behaviour and encouraging understanding, ultimately minimising human impacts and facilitating protection of Niue's unique marine environment.

The Niuean public is well informed and concerned with the protection of their unique marine resources. As such Niue has the potential to become a model for other south pacific nations in building awareness, pride and understanding of their traditional links to cetaceans. There is the potential to develop a marine conservation organisation in Niue with a focus on cetaceans to facilitate public education programs that government departments may be limited in capacity to deliver.

Promoting Niue as a unique place for watching whales from land can be supported by the introduction of a 'Whale Trail' of interpretive signage at prominent headlands on the sanctuary, common whale and dolphin species, natural history and biology, and conservation.

### **Recommendations**

1. Establish a marine conservation NGO in Niue to act as a bridge between regional whale conservation/research initiatives and the Niuean public/Government. Attract funds and support from larger regional NGO's eg IFAW and Whales Alive
2. An annual Tafuā Festival/Whale Day celebration to raise public awareness by sharing and celebrating traditional knowledge of cetaceans - include schools and community participation. This could be coordinated by the local conservation organisations, IWP, Department of Community Affairs, Fisheries, Tourism and Environment.
3. Development of an Education Plan for the whale sanctuary to include 'the whale trail' signage at prominent points on the coast, schools program, and strategy for informing private boaters about the sanctuary

### **Conclusion**

The management of the Niue Whale Sanctuary and the cetaceans contained within it requires the cooperation and involvement of a wide range of. This plan aims to highlight areas of responsibilities, that might be taken up by a wide range of people such as local communities, scientists, environmental and animal welfare NGO's, local and regional government agencies, and commercial industry.

This plan aims to form the basis on which future funding proposals will be prepared.

There is the potential to leverage resources to implement priorities this plan through the NBSAP under CBD, and also through new regional initiatives such as CMS. It is the closing recommendation of this plan for Niue to join CMS.

This plan should be a dynamic document, reviewed from time to time, with opportunities to assess performance in achieving the actions, objectives and aims, review the levels of priority, and to add to, delete or change the recommendations and content of the plan.

The Government and people of Niue are conservation minded and proud of their unique island heritage, which offers many opportunities and support for research and conservation. With the development of the national whale sanctuary and now strong protection measures in the form of Whale Watching Regulations, Niue has become a model for whale conservation and management in the Pacific Region. With ongoing support from SPREP and partner NGO's, this model can benefit Pacific Island nations in the process of developing whale watching nature tourism products and promote the socioeconomic benefits of cetacean conservation throughout the region.

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## Appendix 1

### NIUE WHALE SANCTUARY REGULATIONS 2003

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3	NIUE WHALE SANCTUARY	22
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### REGULATIONS

**PURSUANT** to Section 60 of the *Territorial Sea and Exclusive Economic Zone Act 1997*, the Ministers of Cabinet made the following regulations:

#### **1 Short Title and Commencement**

- (1) These Regulations may be cited as the Niue Whale Sanctuary Regulations 2003.
- (2) These Regulations are deemed to have entered into force on 14 May 2002.

#### **2 Interpretation**

- (1) In these Regulations unless the context otherwise requires the words and expressions used shall have the respective meanings as in the *Territorial Seas and Exclusive Economic Zone Act 1997*.
- (2) In these Regulations the word ‘cetacean’ includes:
  - All species of whales;
  - All species of dolphins; and,
  - All species of porpoises.

#### **3 Niue Whale Sanctuary**

- (1) The Niue Whale Sanctuary is established in order to give formal recognition of the high level of protection already afforded to cetaceans in marine waters of the jurisdiction of Niue in accordance with international law.
- (2) The Niue Whale Sanctuary comprises the waters of the exclusive economic zone, the territorial sea and the internal waters as defined in the *Territorial Seas and Exclusive Economic Zone Act 1997*.

#### **4 Protection Measures**

- (1) A person is guilty of an offence if the person kills, harms, harasses, takes or moves any cetacean in the Niue Whale Sanctuary.
- (2) A person is guilty of an offence if the person has in his or her possession any cetacean, cetacean part or cetacean product in the Niue Whale Sanctuary.

- (3) Unless evidence is produced to the contrary, any cetacean, cetacean part or cetacean product found in the possession of a person in the Niue Whale Sanctuary, is deemed to have been taken in the Niue Whale Sanctuary.
- (4) A person is guilty of an offence if the person exports or facilitates the exportation from Niue of any cetacean, cetacean part or cetacean product.
- (5) A person is guilty of an offence if the person imports or facilitates the importation into Niue of any cetacean, cetacean part or cetacean production.
- (6) Any offence under this Regulation is punishable on conviction by imprisonment for not more than 3 months, or a fine not exceeding \$250,000, or both.

### **5 Non-lethal Research Permits**

- (1) The Cabinet may approve the issuance of a permit for the purpose non-lethal research intended for the conservation of cetaceans, if the Cabinet is satisfied that the non-lethal research will not result in the killing, harming, harassing, taking or moving of any cetaceans.
- (2) The Cabinet may specify conditions in relation to any permit issued under this Regulation.
- (3) A person is not guilty of an offence under Regulation 4 if the person carries out an activity authorised by a permit and in accordance with the conditions of the permit.

**Approved by Cabinet at the Cabinet Chambers, Fale Fono, Alofi this**

**17<sup>th</sup> day of July 2003.**

**Signed** by Hon. Young Vivian  
**Premier**

\_\_\_\_\_

**Countersigned** by Ngatu Tukutama  
**Clerk to Cabinet**

\_\_\_\_\_

## Appendix 2

### Niue Whale Watching Regulations (DRAFT 05)

#### Purpose

The purpose of these regulations is to make provision for the protection, conservation, and management of marine mammals and, in particular,--

(a) To regulate human contact or behaviour with marine mammals either by commercial operators or other persons, in order to prevent adverse effects on and interference with marine mammals:

(b) To prescribe appropriate behaviour by commercial operators and other persons seeking to come into contact with marine mammals.

#### Interpretation

"Commercial operation" or "operator" means an operation carried on for any form of hire or reward in which persons are transported, conveyed, conducted, or guided where a purpose is to view or come into contact with any cetacean, or advertises to do so, in Niue waters:

"Cetacean" means all species of whales, dolphins and porpoises

"Director" means the Director of the Department of Agriculture, Forestry and Fisheries (DAFF)

"Dolphin" means:

(a) All species commonly known as dolphins; and includes spinner dolphins, common dolphins, and bottlenose dolphins, but one

(b) Does not include the species known as killer whales and pilot whales:

"Harass" includes to do any act that--

(a) Causes or is likely to cause injury or distress to any marine mammal; or

(b) Disrupts significantly or is likely to disrupt significantly the normal behavioural patterns of any marine mammal:

(c) is contrary to the conditions specified in the Niue Whale Watching Guidelines

"Licensed operator" a commercial operator holding a current whale watching licence

"swimming encounters" means any in water activity (swimming, snorkelling, free diving) that is conducted where the purpose is to view or come into contact with a cetacean

"Vessel" is defined as any boat, craft or ship propelled by oars, sail or motorised, but does not include traditional canoe (Vaka)

"Whale" means all species commonly known as whales; and includes baleen whales, sperm whales, beaked whales, killer whales, and pilot whales:

"Working day" means any day except Sunday

#### Licensing

**"Whale Watching Licence"**



Subject to these regulations, the Director, on receiving an application made in writing, may issue a Licence authorising a commercial operator to carry on a specified commercial operation.

(1) Every permit issued to a commercial operator shall specify the following:  
(a) The type and number of craft or vessels to be used by the operator:  
(b) The names of the masters of vessels, operators and crew engaged in the commercial operation:  
(c) The area of operation to which it relates:  
(d) That all vessels operated under the permit, and their operators, respectively, must meet the requirements relating to the safety of the vessels and qualifications and licensing of the operators and crew, as the case may require.

(2) The Director shall not issue a Licence unless he or she is satisfied--  
(a) That the proposed commercial operation will not have or be likely to have any adverse effect on the conservation, protection, or management of marine mammals; and  
(b) That the criteria specified in these regulations have been substantially complied with

(3) Licenses are only granted for a one year period and are renewable at the Director's discretion

(4) No licence for any commercial operation may be transferred from the holder to any person or business without first obtaining the consent in writing of the Director

#### **“General Licence Requirements”**

Before issuing a licence, the Director shall be satisfied that there is substantial compliance with the following criteria:

(a) That the commercial operation should not be contrary to the purposes and provisions of the Niue Whale Sanctuary Regulations 2003  
(b) That the commercial operation complies with the Niue Whale Watching Guidelines  
(c) That the commercial operation should not have any significant adverse effect on the behavioural patterns of cetaceans  
(e) That the proposed operator and their crew who, may come into contact with cetaceans, should have undergone a Fisheries/ Whales Alive training session  
(f) That the proposed operator and crew who may come into contact with cetaceans, should have sufficient knowledge of the local area and of sea and weather conditions:  
(g) That the proposed operator and crew who may come into contact with cetaceans, should not have convictions for offences involving the mistreatment of animals:  
(h) That the commercial operation should have sufficient educational value to participants or to the public.  
(i) That the commercial operator pay an annual Licence Fee that is determined by the nature of the activity and is payable to the Niue Fisheries Division, DAFF  
(j) For boat based whale watching operations vessels must be equipped with safety equipment as per section 8. (1), (2), (3), (4) of the Domestic Fishing Regulations 1996

#### **Additional License Requirements:**

(1) For whale watching operations engaging in “swimming encounters”:

- (a) The operator, master and crew must be certified in Senior First Aid and Marine Rescue
- (b) The operation must have public indemnity insurance
- (c) The operator must carry a 50m flotation line for swimmer safety

### **Revocation or Restriction of Licence**

- (1) The Director may at any time suspend or revoke any licence, or restrict the operation authorised by any licence, where the holder:
  - (a) Is convicted of any offence under the Niue Whale Sanctuary Regulations 2003
  - (b) Contravenes or fails to comply with any requirement relating to the licensing and safety of any commercial operation; or
  - (c) Carries on a commercial operation without appropriately certified crew
  - (d) Contravenes or fails to comply with the Niue Whale Watching Guidelines

### **"Special Interaction Permit" (SIP)**

(SIP) is a permit issued by the Director for interacting with cetaceans for the purpose of: Scientific research, Education, Photography (still and film) and Aircraft.

- (1) Every applicant for a SIP is required to include a local guide/ observer designated by the Director
- (2) The Director may issue a permit for any period of time not exceeding 3 years
- (3) Fees pertaining to every SIP are determined by the nature of the activity and are payable to the Niue Fisheries Division, DAFF
- (4) Every applicant for a SIP shall submit to the Director for approval an application in writing setting out the following:
  - (a) Details of the proposed operation, including--
    - (i) The type and number of vessels intended for use; and
    - (iii) The proposed area of operation
    - (v) The proposed base of operation:
    - (vi) The duration of trips proposed:
    - (vii) The frequency of trips proposed:
    - (viii) The proposed kind of contact with marine mammals:
    - (ix) The maximum numbers of passengers intended to be taken at any one time:
    - (x) The species of cetaceans with which the operation will have contact:
    - (xi) The masters proposed to be engaged in the operation and their qualification:
  - (b) The experience with cetaceans of the proposed operator and such of the operator's proposed staff who may come into contact with cetaceans:
  - (d) The details of any convictions of the proposed operator and of those employees of the operator who may come into contact with cetaceans, for offences involving the mistreatment of animals:
  - (e) The details of any educational material to be provided or educational aspects of the proposed operation.

### **Niue Whale Watching Guidelines (Reviewed 2005)**

- No commercial operation other than licensed Niuean whale watching operators are permitted to interact with whales
- No vessel shall approach closer than 50m to a whale
- All vessels must slow to a no wake speed of 4 knots within a 200m *Caution Zone* (refer to diagram)
- No more than two vessels may be in the *Caution Zone* at one time
- Swimmers must not approach a whale closer than 30m. If a cetacean approaches the person, he or she:
  - (a) must move slowly to avoid startling it; and

- (b) must not try to touch it or swim toward it.
- No more than 6 people per vessel may swim with any one group of cetaceans at a time
  - Other vessels must keep at least 100m from the swimmers' vessel
  - No person or vessel shall approach within 100 metres of any baleen or sperm whale that is accompanied by a calf or calves
  - Vessels are limited to 1/2 hour encounters with any one group of cetaceans
  - The use of SCUBA is not permitted for swimming with whales
  - The use of flash/ artificial light sources is not permitted for whale watching
  - No whale watching is permitted where traditional fishing by Vaka or Tapu is being practiced
  - Use of jet skis, motorised swimming aids and vessel tenders (dinghy) not permitted for cetacean watching encounters
  - No person is permitted to touch a cetacean
  - Vessels must operate so as not to disturb or disrupt the normal movement or behaviour of any cetacean
  - Vessels must break from the encounter if cetaceans show signs of disturbance eg rapid change in direction or speed, prolonged diving, or evasive swimming patterns
  - No vessel shall intercept the path of a cetacean, drive through a pod of cetaceans, or separate members of a pod of cetaceans
  - Vessels and persons should avoid making loud or sudden noises near cetaceans
  - Vessels must exercise additional caution when observing pods of cetaceans containing calves
  - Vessels must not approach cetaceans from directly behind or head-on. This is an *Exclusion Zone* for vessels (refer to diagram)
  - Whale watching is only permitted on working days

Appendix 3



**A Base Line Survey of Cetaceans  
In the Territorial Seas of Niue Island,  
South Pacific**

**A Proposal by  
Olive Andrews  
Whales Alive**

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Project Objectives	4
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## Introduction

Niue Island is situated north east of New Zealand in the central South Pacific Ocean. The island is an isolated, raised coralline platform at 19° S, 170°W, which is surrounded by a fringing coral reef that supports a diversity of marine species, many of which are endemic. The island appears to represent important habitat for wintering humpback whales, a resident group of spinner dolphins, and anecdotal sightings data suggest, is frequented by many other cetacean species including pilot and minke whales. Genetic information gathered from a stranding event in 2003 also indicates the presence of sperm whales.

Though no dedicated marine mammal surveys have been conducted in these waters, anecdotal information and broader scientific studies suggests that up to 30 cetacean species may occur here. Most of what is known of Mysticetes and sperm whales in the Oceania region comes from historical whaling data (Townsend, 1935; Dawbin, 1964). Smaller toothed whale species have been described in Reeves *et al*, (1999) by non-systematic surveys. Of the known species present in Niue, both sperm and humpback whales are listed by the IUCN as Vulnerable (IUCN, 2003). The island of Niue may represent critical habitat for these whales, whose populations were subject to commercial exploitation this century hence work undertaken here supports IFAW's objectives within the Wildlife Habitat Program.

The island's people have strong links to the sea and place high value on the conservation of the island's unique marine resources. All species of cetaceans have been protected in Niuean waters as 'protected fish species' since 1996 under the Domestic Fishing Regulations and as outlined in the 1997 Territorial Sea and Exclusive Economic Zone Act. Niue Fisheries, Niue Tourism and private sector are particularly concerned with the protection and management of marine mammals found in Niuean waters and as such, in May 2002, Niue formally declared the waters of its EEZ a whale sanctuary to complement existing fisheries legislation.

Supported by IFAW, a management plan is in development for the Niue whale sanctuary, which identifies the need for scientific research to identify cetacean species and their abundance and distribution. This information is needed before management strategies such as zoning, seasonal closures, tourism licensing and fishing gear restrictions can be developed to better protect and manage cetaceans within the sanctuary, particularly species of conservation concern such as humpback whales. The plan is timely due to the development of a substantial long line fishery, the impact on cetaceans of which is unknown.

During the last century, the Humpbacks of the Southern Hemisphere have been reduced to less than 10% of their original populations by commercial whaling (Donoghue and Baker, 2000). Recovery in the abundance of humpback whales in Oceania has been slow and variable. Correspondingly, sightings remain rare around several island groups where they were once common, such as Niue. The great majority of islands in Oceania have never been surveyed for the presence of humpback whales, and their use of most of the potentially available habitat is therefore unknown (Guarrigue et al, 2001).

The long term research projects of the South Pacific Whale Research Consortium (SPWRC) in New Caledonia, Tonga, Cook Islands, and French Polynesia has identified that there is interchange between Group V and Group V1 humpback whales of the eastern and western south pacific ocean, which were thought to show fidelity to specific breeding grounds. These findings confirm the interconnectedness of whales across the region and highlight their slow recovery, which is building the case to ensure that protection measures are consistent across their range.

As Niue is directly between Cook Islands, Samoa and Tonga it is uncertain whether whales that migrate to Niue are more genetically related to the eastern or western Pacific populations. One of only 2 individual humpback whales identified in Niue has been matched to the Cook Islands in a previous year, which could represent a significant link.

The Secretariat for the South Pacific Regional Environment Programme (SPREP) Whale and Dolphin Action Plan, partnered and supported by Whales Alive and IFAW, recommends that baseline cetacean surveys be initiated in the region to develop species inventories and identify species and habitat of conservation concern. It also advocates expansion of existing research programs to include areas not previously covered such as Niue and encourages the inclusion of local capacity where possible. The proposed project meets these priority objectives of SPREP and partner NGO's.

The second workshop on the Convention on Migratory Species (CMS) & Marine Mammal Conservation in the South Pacific also noted that the lack of adequate data and scientific knowledge of cetaceans in the region is a major concern. And consequently, the development of an inventory of cetacean species for each country is a top priority. The project proposed meets these priority objectives of CMS and IFAW.

Funding is sought from IFAW to support a base line survey of cetaceans in the Territorial seas of Niue Island in the form of a grant over 3 yrs.

### **Project Objectives**

- Identify a cetacean species list for the Territorial seas of Niue
- Generate abundance estimates for cetacean species identified in Niue waters using visual and acoustic data
- Define areas of critical habitat for cetaceans in Niue waters
- Species and habitat information generated from this survey will be used to achieve management and conservation goals of the Niue whale sanctuary
- Species and habitat information generated from this survey will be used to manage the growth and sustainability of whale and dolphin watching tourism in Niue
- Generate a photo ID catalogue of individual humpback whales in Niue for comparison with SPWRC catalogues
- Identify the genetic relatedness of humpback whales in Niue to other populations in the south Pacific region through opportunistic collection of skin

### **Collaboration**

The Survey outlined herein proposes a collaborative project between Whales Alive, Niue Fisheries, Southern Cross University Whale Research Centre (SCUWRC), SPWRC and IFAW.

**Whales Alive** is a Pacific based, non-profit organisation dedicated to the protection and celebration of Whales and their fragile marine habitat. Offices in Australia, Tonga and Hawaii act as a bridge between current marine mammal research and the community. Funded only by grants and donations, Whales Alive provides specialised training for marine guides working in the whale watching industry, gives technical advice on marine mammal conservation and management issues to Governments, industry and community. Whales Alive has worked in partnership with SPREP and SPWRC on whale research in Tonga from 1995 and conducts humpback research in Hawaii. Whales Alive's in-kind contribution of human resources and equipment is underpinning the project.

**Niue Fisheries** is a Division of the Government Department of Agriculture, Fisheries and Forestry (DAFF). Capacity has been identified locally with a junior Fisheries Officer, Fiafia Rex, to be involved in the planning, conducting, and analysis of the project such that local authorities develop skills and gain the potential to continue the project into the long term. Niue Fisheries contribution to the project will be in-kind in the form of personnel and equipment. An appropriate research permit will be granted by Niue Fisheries. (The project will also require an EPBC research permit granted by DEH)

**SCUWRC** has an MOU with IFAW and collaborates with Whales Alive and SPWRC on cetacean research projects in the region. It is proposed that the project meet the requirements for the Principal Investigator, Olive Andrews, to complete a Masters degree attracting supervision from SCUWRC Adjuncts recognised as global experts in cetacean research.

The **SPWRC** is investigating the status of humpback and other whale species in the region of Oceania through genetic, acoustic, and photo identification research. It is proposed that photo ID, genetic and acoustic samples gathered from the Niue project be compared to and analysed with the assistance of SPWRC. Results from this work will indicate abundance, distribution and migratory information, which is crucial to the conservation and management of whales and the development of whale watching tourism in Niue and the region.

### Survey Design

The area determined for this study can be defined as the area 30 nautical miles to seaward of the Niue coast. Roughly the circular area covered by 4 squares surrounding Niue Island in FIG 1. About 1/10<sup>th</sup> of Niue's EEZ. As there is virtually no continental shelf and the ocean depth drops very steeply from Niue's reef edge to 5000m, the area covered is estimated to be adequately representative of the largely pelagic habitat that cetaceans inhabit in the Territorial Seas of Niue.

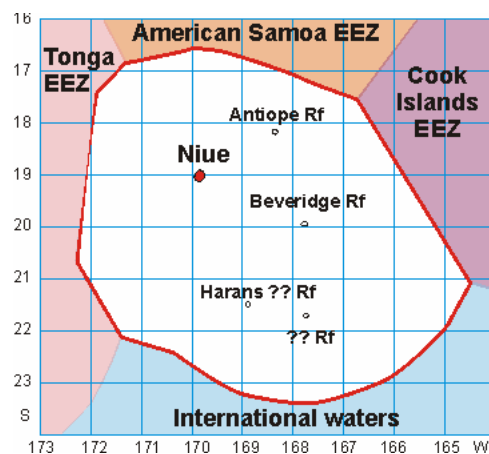


FIG 1. Niue EEZ

A vessel based, systematic, line transect survey will be undertaken and distance sampling methodology employed to generate a detection function and hence density estimate of each species of cetacean encountered in the survey area (dependant on sufficient sightings). As Niue experiences prevailing southeast tradewinds, each of 20 parallel transect lines in the selected area will run SE – NW from a random start point.



Research effort will be conducted during the austral winter (Aug - Sept) for a 3-year period. The study period spans this season as it is the time when humpbacks occur in tropical breeding grounds (Carwardine *et al*, 1998). The survey platform will be a live-aboard 40ft power catamaran (In my dreams! Vessel TBC). Crew will consist of 2 observers, 1 data recorder, 1 photographer, and a boat master and deckhand. Species observed on the transect lines will be identified by experienced observers using naked eye and binoculars. Distance from the vessel to the animal will be measured using reticle poles and angle from the track line to the animal will be measured using angle boards mounted to the vessel. Where possible photography will be used to document encounters where species ID is not confirmed. Where humpback whales are identified, the vessel will leave the transect line and go 'off effort' to conduct photo ID and opportunistic genetic sampling.

Sloughed skin samples will be collected opportunistically for DNA and gender analysis. Skin samples will be collected using a 20cm diameter metal sieve extended from a 2m pole. Skin will be placed in a test tube with 70% ethanol and frozen until lab analysis can be completed.

Acoustic samples will be recorded using a hydrophone and DAT recording system.

Recordings will be systematic, point transect samples for duration of 20min.

Photographs will be taken with a 35mm Canon EOS camera equipped with a 300m telephoto lens and printed on colour slide film. Each slide will be assigned a unique observation number, which will correspond to observations recorded for the encounter including sightings date, location, pod size, and behaviours exhibited. The slides will then be categorised according to % white pigmentation on the ventral fluke and other distinguishing marks. Information will be stored on computer in a statistical analysis system (SAS) data file, forming a library of sighting histories, which will be compared for matches in consecutive years in Niue and matched to other SPWRC catalogues. This method has been described by Mizroch and Baker (IWC, 1990) and has been successful in studies of humpback whale populations around the world.

Based on the sightings of individual humpback whales over 3 seasons, we derive a weighted mean of a Petersen estimate (Begon, 1979) to suggest population abundance with 95% confidence intervals.

### **Personnel**

Principal Investigator: Olive Andrews – Whales Alive/ SCWRC

Supervisor: Phillip Clapham – Northeast Fisheries Science Centre, Woods Hole/SPWRC/ SCUWRC Adjunct (TBC)

Supervisor: Scott Baker – Auckland University/ SPWRC/ SCUWRC Adjunct (TBC)

Supervisor: Peter Harrison – Director SCUWRC

Research Assistant: Fiafia Rex – Niue Fisheries DAFF

Project Consultant: Brendon Pasisi – Director Niue DAFF

Field Assistants: 3 (TBC) – Whales Alive

Budget is sought from IFAW and others for each of the financial years 2006, 2007, 2008.

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## Appendix 4

### **PLAN OF ACTION AND PRIORITIES FOR RESEARCH TO REDUCE DEPREDAATION ON LONGLINES BY CETACEANS**

#### **PRIORITIES FOR MITIGATION AND CURRENT INFORMATION ON BEST PRACTICE**

For a number of reasons, including the legal protection that is afforded to cetaceans by various statutes and the desirability of finding solutions that will work in the long term, participants recommended that only non-lethal methods be employed to discourage or avoid depredation. In addition, participants acknowledged that while much work is needed to develop and field –test a mitigation strategy for any of the fisheries discussed, the following suggestions presently have merit in attempting to reduce depredation by cetaceans:

- Vessel and gear noise management, both in the design and operation of the vessel. To the extent that is practical, noise should be minimized while traveling to fishing grounds and during fishing operations (e.g. turn off echo sounder, reduce noise of winch, propeller)
- Consider changes in fishing season, gear, setting and hauling times, and fishing areas
- Avoid hotspots – areas where cetaceans congregate
- Check (visually and/or acoustically) for potential predators before setting or hauling and try to avoid doing either when cetaceans are in the vicinity
- Suspend or delay hauling if depredation is noticed (demersal longlining only)
- Improve the abilities of fishermen to identify cetacean species
- Avoid chumming or discarding offal and bait in the vicinity of fishing locations
- Encourage fishermen to communicate their experiences with mitigation, and their concerns about depredation, e.g., via the list-serve
- When feasible, use a decoy vessel to distract cetaceans away from the fishing area
- Try setting dummy/false gear to mislead the cetaceans and direct them away from the fishing area
- Encourage scientists or observers to travel aboard longline vessels to provide expert advice on species identification and behavior.

The workshop strongly encouraged research and development of acoustic and other approaches to mitigation. It was noted that no acoustic deterrent is presently available to offer as a “quick fix” for this problem. In fact, the use of acoustic devices could just as easily have a “dinnergong” effect.

**Participants emphasised the need for rigorous scientific trials to demonstrate effectiveness before broad-scale adoption of any particular mitigation device or procedure.**