

FOR CONSIDERATION OF THE SCIENTIFIC COMMITTEE OF  
THE INTERNATIONAL WHALING COMMISSION  
MADEIRA, MAY 31 – 12 JUNE 2009

## Report of the Annual Meeting of the South Pacific Whale Research Consortium

9<sup>th</sup> February - 12<sup>th</sup> February 2009  
Auckland, New Zealand

*Address for correspondence:*

The Secretariat  
South Pacific Whale Research Consortium  
P.O. Box 3069  
Avarua, Rarotonga  
Cook Islands

### ABSTRACT

*Members of the South Pacific Whale Research Consortium met at the University of Auckland from 8-12 February, 2009 to discuss (i) the results of fieldwork and analysis conducted during 2008 and, (ii) conservation initiatives in the region. As with previous synoptic surveys dating back to the austral winter of 1999, surveys of humpback whales were conducted to collect genetic samples, individual identification photographs and song recordings in the four primary regions: New Caledonia, Tonga (Vava'u), Cook Islands and French Polynesia (Moorea). Other regions surveyed in 2008 included Samoa, American Samoa, Fiji, New Zealand, Niue, Norfolk Island, Hervey Bay, Peregian Beach and Eden.*

*A total of 218 photo-identified individuals recorded from throughout the Oceania region during 2007 were matched against the quality-controlled Oceania region photo-ID catalogues from the years 1999-2007. This revealed additional evidence of low levels of interchange among breeding grounds of Oceania. Following the genotype match reported between French Polynesia and Colombia (breeding stocks F and G) reported in the 2008 SPWRC report, a comparison of quality controlled flukes from French Polynesia and the Antarctic Peninsula was undertaken during 2008. This comparison did not produce any confirmed matches between the two regions. Song analysis for the years 2002-2006 showed a pattern of sequential movement of unique song types from eastern Australia, east across the breeding grounds of Oceania. Members once again expressed their opposition to Japan's continued lethal research programme in the Antarctic and their concern that the ongoing or planned hunt of fin and humpback whales could negatively impact small, recovering populations some of which are the subject of long-term, non-lethal research by the Consortium.*

### PARTICIPANTS

*Executive Committee:* Scott Baker (University of Auckland, NZ & Oregon State University, USA), Phil Clapham (US National Marine Mammal Lab, USA), Claire Garrigue (Operation Cétacés, New Caledonia), Mike Donoghue (Department of Conservation, NZ), Michael Poole (Marine Mammal Research Programme, French Polynesia & National Oceanic Society, USA), David Paton (Blue Planet Marine & Southern Cross University, Australia), Nan Hauser (Cook Islands Whale Research, Rarotonga & Centre for Cetacean Research & Conservation).

*Executive officers:* Rochelle Constantine (University of Auckland, NZ), Mike Noad, (University of Queensland, Australia), Debbie Steel (Oregon State University, USA), Sue Taei (Pew Pacific Node Coordinator, IFAW & Conservation International, Samoa), Simon Childerhouse (Australian Antarctic Division, Australia)

*General members:* Adrian Oosterman (Norfolk Island Whale Survey, Australia), Aline Schaffar (Operation Cétacés, New Caledonia), Dan Burns (Southern Cross University & Whale Research Centre, Australia), Darren Kindleysides (IFAW, Australia), Ellen Garland (University of Queensland, Australia), Eric Kniest (University of Newcastle, Australia), Juney Ward (Ministry of Natural Resources & Environment, Samoa), Kirsty Russell (University of Auckland, NZ), Marc Oremus (University of Auckland, NZ), Megan Anderson (Southern Cross University, Australia), Nadine Bott (Department of Conservation, NZ), Olive Andrews (IFAW, Samoa), Trish O'Callaghan (Auckland, New Zealand), Wally Franklin (Oceania Project & Southern Cross University, Australia).

*Invited participants:* Aisake Tanidralla Batibasaga (Fiji Fisheries Department, Ministry of Primary Industries, Fiji), Caroline Schweder-Goad (BOP Polytechnic, NZ), David Donnelly (Dolphin Research Institute, Australia), Dominique Benzaken (Department of Environment, Water, Heritage and the Arts, Australia), Emmanuelle Martinez (Operation Cétacés, New Caledonia), Fred Patterson (Ministry of Environment, Solomon Islands), Gabriela Tezanos-Pinto (University of Auckland, NZ), Greg Soljak (Department of Conservation, New Zealand), Jennifer Symons (Cook Islands Whale Research, Rarotonga), Jooke Robbins (Provincetown Centre for Coastal Studies, American Samoa, USA), Karli Thomas (Greenpeace NZ), Kirsten Thompson (University of Auckland, NZ), Lole Lui (Tonga Whale Watch Association, Tonga), Mark Orams (AUT University, NZ), Maryrose Gulesserian (Macquarie University Marine Mammal Research Group, Australia), Megan Kessler (Macquarie University Marine Mammal Research Group, Australia), Nick Gales (Australian Marine Mammal Centre, Australia), Patrice Plichon (Southern Province, New Caledonia), Renee Gibb (Oregon State University, USA), Schannel van Dijken (University of Auckland, NZ), Susan Ronn (Cook Islands), Yulia Ivashchenko (National Marine Mammal Lab, USA)

*Apologies:* David Mattila (Hawaiian Islands Humpback Whale National Marine Sanctuary, USA), Lui Bell (SPREP, Samoa), Mick McIntyre (Whales Alive, Australia), Mike Noad (University of Queensland, Australia), Trish Franklin (Oceania Project & Southern Cross University & Whale Research Centre, Australia),

## INTRODUCTION

The ninth annual meeting of the South Pacific Whale Research Consortium (SPWRC) was held at the University of Auckland from 9<sup>th</sup> to 12<sup>th</sup> February 2009. Mike Donoghue welcomed participants, and particularly thanked attendees from Samoa, Fiji, Tonga and the Solomon Islands for joining the meeting. Scott Baker was elected chair and Simon Childerhouse, Renee Gibb and Phil Clapham agreed to serve as rapporteurs, with assistance from other members. Baker thanked Rochelle Constantine and Debbie Steel for organising and convening the meeting.

Mike Donoghue thanked organisations for their ongoing support of the Consortium, in particular, our primary and long term sponsor, The International Fund for Animal Welfare (IFAW), and also to a new supporter, the Pew Foundation. He reflected on the growth in membership and achievements of the Consortium since its establishment 10 years ago. Despite a number of the Executive Committee/Executive Officers moving away from New Zealand, the activities of the Consortium have continued to expand. New studies have been successfully implemented, and new sponsors have committed to providing support for a part-time co-ordinator of the Consortium's work programme. Thanks to the funding provided by sponsors, participants from several parts of the Pacific Islands region, including Samoa, Fiji, Tonga and the Solomon Islands were able to attend the meeting. The meeting was attended by 49 participants from 10 different South Pacific countries.

A major achievement in 2008 was the submission led by Consortium members to IUCN regarding the revised status on the Red List of humpback whales. The submission drew upon and summarised the data collected by the Consortium over the past decade. Although humpback whales globally were re-

classified from “Threatened” to “Least Concern”, as a direct result of this submission, humpback whales in Oceania were re-classified as “Endangered”.

The Consortium also received a contract from NIWA to carry out modelling work on southern right whales, the results of which indicate that prior to commercial whaling activities in the 19<sup>th</sup> Century, the New Zealand population of southern rights was twice as large as previously believed; and that it came much closer to extirpation than had been thought.

A further auspicious event of 2008 was the inauguration of HRH Princess Salote Pilolevu Tuita as the Royal Patron of Whales in Tonga. The Princess has established a Trust Fund to support educational and conservation initiatives connected with whales in Tonga.

Important meetings for the Consortium in 2009 include the Sydney workshop in March to discuss a Southern Ocean Research Partnership and the First International Conference on Marine Mammal Protected Areas, held in Hawai’i in April.

Donoghue noted that the expansion in the Consortium’s work continues to be set against a backdrop of the lethal research programme of scientific whaling conducted by Japan in the Southern Ocean, this summer in the Ross Sea area. He suggested that the Consortium’s dedication and commitment to hard work and robust non-lethal science provided a vital counterweight to the JARPA II programme.

## ANALYSIS OF RESULTS

### *Synthesis of results on humpback study in New Caledonia from 1996 to 2005 (Claire Garrigue)*

Humpback whale surveys were conducted between 1996 and 2005 in the southern province of New Caledonia. The total sampling effort was 446 days and 2873 hours at sea. During this time 525 groups of whales were observed comprising 891 individuals. The characteristics of the New Caledonian population of humpback whales have clearly shown that this population must be considered as small and vulnerable, representing a single management unit. Humpbacks are found all around the southern province but the distribution is heterogeneous with most of the groups (88 %) encountered in the southern lagoon. In this region whales are generally well distributed with the exception of areas of high reef density. Multiple analyses have been used to test the spatial and temporal distribution of groups and to compare distribution of groups with different social compositions. These analyses showed that the lagoons of the southern province are not uniformly used by all kind of social groups and that some areas seem to be characterized by the presence of specific social categories. Two preferred areas have been identified. The first is directly south of the main land and the second is situated on Banc de La Torche. Both cover a total of 120km<sup>2</sup>. Whales were mainly observed at a water depth of 50 to 100 m (58 % of groups encountered) with little preference shown for either shallow water (0 to 30 m) or deep water (> 100m). Ratios between groups containing mothers and calves and groups without mother and calf have been used to define key habitat for mothers and calves. At the end of 2007 we considered that SE lagoon is a critical habitat for mothers and calves. The slope of the south lagoon and the south west lagoon are probably an important habitat for this vulnerable group. Results showed that roughly 25 % of mothers and calves are observed in shallow water. 2915 acoustic samples were taken during the 10 year study. Song was heard in 53 % of the deployments, mainly in the south lagoon and Isle des Pins. A Generalized Linear model was used to study spatial distribution of the deployments. This showed that the probability of hearing song is significantly greater at Isle des Pins which is the only area where the probability of hearing a singer is greater than of not hearing any song. Acoustic activity is not homogeneous over the season but this is only statistically significant for some years. Acoustic activity increased during the season which agrees with the increase in reproductive activity. Acoustic activity is not dependent of the time of the day.

### *Photo-ID comparison (Kirsten Thompson, Rochelle Constantine, Claire Garrigue)*

Kirsten Thompson reported on comparisons of photo-identification data from 2007 from all Oceania regions from 1999 - 2007. In total, 218 individual humpback whales were seen in 2007 from regions - Tonga Vava’u (45), New Caledonia (72), Cook Islands (13), French Polynesia (41), American Samoa (34), Samoa (11), New Zealand (3) and Kermadec Islands (2) – and are represented by images which have passed SPLASH scoring. One image from Norfolk Island failed the SPLASH quality control criteria but was also matched. Within 2007, 3 matches between American Samoa and Samoa were found. Another 8 matches were found between individuals seen in 2007 and whales seen in previous years 1999 – 2006. Any previous data on these individuals is being gathered.

Other work carried out included the addition to the Tonga Vava'u catalogue of 21 new individuals photographed by Bay of Plenty Polytechnic in 2006 to the Tonga Vava'u catalogue. These images passed the SPLASH quality control criteria and a further four images failed. Of these 21 new 2006 individuals six matched whales from Tonga in previous years. Three images taken in 2006 in New Caledonia were also added to the NC catalogue and one individual was seen in Ha'apai in 2000. Images taken in New Zealand prior to 2005 were compared with Oceania 2005-2007 as well as the 1999 – 2004 Oceania catalogue. This resulted in one match (reported in Constantine *et al.* 2007). Images taken in Niue before 2005 were matched to Oceania 2005 - 2007 in addition to the 1999 - 2004 Oceania catalogue. No matches were found. See Table 1 for a summary of photo-identification matches made between regions when comparing animals photographed in 2007 to all previously photographed individuals.

*Fluke matching software (Dan Burns, Eric Kniest)*

Eric Kniest and Dan Burns summarised the continued development of the computer-based fluke-matching program 'Fluke Matcher'. This software increases the efficiency of matching humpback whale flukes and is based on transformation to standardise each fluke using five standard control points, and measuring various characteristics of the fluke including the shape (angles and distances), percentage of black in various regions of the fluke, thickness of the black band along the trailing edge, and positions of various features on the fluke including spots, lines and scars. The database can be queried to search for matching flukes, with the results being displayed in order from most likely to least likely match. The system was tested using 440 photographs of 194 whales collected in Hervey Bay (E Australia) from 1994-2006, with each whale being represented by up to five images (a total of 596 matching pairs). 31% of searches resulted in the matching fluke being ranked first out of 439 flukes in the database, 80% were ranked in the top 5% of the database, 98% in the top 20% and 100% in the top 34%. A grant from the Australian Marine Mammal Centre for 2008/9 to further increase efficiency and finalise the development of the program, as well as to produce a user manual, will result in 'Fluke Matcher' being made freely available to interested parties.

*Abundance estimate French Polynesia (Rene Albertson-Gibb)*

The abundance of humpback whales in French Polynesia was estimated by sighting-resighting analysis of individual identification fluke photographs collected from 1999 to 2007. Photographs were collected from dedicated and opportunistic vessels from July through December each season in Moorea and Rurutu. Each season was considered a capture period. These photographs were reconciled yearly and compared for resights with previous years. The catalogue for these years is referred to as usable photos and contains 406 individual whales. These photographs were quality controlled by members of the South Pacific Whale Research Consortium using a rating system with five different categories (based on the SPLASH quality control system). If a photo didn't pass in one or more categories it was excluded. The Quality Control catalogue consists of 256 of the original 406 whales. Estimates of abundance were reported for both usable photos and quality control using one closed population model (adjusted for time and heterogeneity, but unadjusted for mortality) and two open population models. The open population models were about 30% lower than the closed population model. Compared to the 2006 estimate done by Baker *et al.* (2006), which analysed usable photos corrected for time and heterogeneity in the programme Capture, the closed population model showed a considerable increase in the population. This most likely contains a positive bias due to the assumption of a closed population for the nine year study period. This closed population assumption is not biologically feasible, so was only used as a rough comparison with the 2006 estimate. Despite this violated assumption, it appears the population is increasing. The open population models present a more biologically sound estimate but have less statistical power shown by high standard errors and high CVs. Quality control estimates were almost one third less than the usable photo estimates. These results are important to report since they have higher capture probabilities than the usable photos and these quality control photos represent a lower error rate due to the consistent clarity of the photos.

*Whale song (Ellen Garland)*

The preliminary results of the qualitative song matching from the western and central South Pacific region from 1998 to 2006 were presented. There were at least six song types which were shared dynamically between populations. It was emphasized that this was preliminary and would undergo further refinement. As previously noted, song changes spread in an easterly direction from the east Australian population to New Caledonia, Tonga, the Cook Islands, French Polynesia and other smaller

populations in the region. Future work includes analysis of the 2007 & 2008 data set and the undertaking of quantitative analyses to complement the qualitative comparisons.

*Effects of vessel traffic on whale behaviour in New Caledonia from 2005 to 2007 (Aline Schaffar)*

A. Schaffar collected theodolite data between 2005 and 2007 on interactions between humpback whales and whale watching boats from a land-based station in New Caledonia. These data were analysed using a multiple linear regression model. The database available for this analysis consists of 146 days of observation and 154 groups of tracked humpback whales. The analysis showed that humpback whales significantly decrease the linearity of their path of travel and significantly increase their dive time when boats are present within 1000 meters of the animals. Linearity also decreases significantly as the number of boats present with whales increases. The level of exposure of humpback whales to boats for the 2005-2007 period was high and above the limits usually enforced in other countries. These results may have long term implications for the New Caledonian humpback whale population. In 2008, the commercial tour operators voluntarily signed a code of conduct. Compliance proved to be high and a significant decrease in the level of exposure was demonstrated. This is likely to be as a result of the implementation of the code of conduct but also of the frequent presence of a patrol boat, and of a high number of whales in the area that season. Regulations have been recommended in order to address observations made by recreational boats and to ensure the long term sustainability of the whale watching industry. Further surveys will be conducted to assess the effectiveness of management measures on reducing the impact of whale watching boats on the whales' behaviour.

*Telomeric aging (Nick Gales, Megan Anderson)*

Nick Gales reported on the Australian Marine Mammal Centre's research on the use of telomeres as an index of whale age. He presented a range of technical reasons why it is highly unlikely telomeres will yield usable results for this purpose in the near future. Nick also described other molecular approaches to age determination in whales and in particular noted the success other groups had enjoyed in using fatty acid ratios in the outer blubber region for aging purposes. He informed the group that Simon Jarman at the AMMC was investigating the use of mRNA for molecular aging.

Megan Anderson reported on work by Southern Cross University (SCU). Their aim is to determine if telomeres of whales decrease in length over time and if so, can we determine the approximate age of whales using telomere length? Two standard methods are currently being used: Telomere Restriction Fragments (TRF) and Real-Time quantitative PCR (RT-PCR). Early TRF results were difficult to interpret however, recent preliminary analyses of mother and calf pairs suggest that many calves have telomeres that are longer than their mothers telomeres, however, differences are generally small < 1kbp in relation to mean TRF ~ 8kbp. This result may have implications on the use of RT-PCR for ageing whales using telomeres because in order to accurately detect differences in telomere length a two-fold difference in length may be required. Additionally, both TRF analyses and RT-PCR suggest that the length of a calf's telomeres may be dependent on the length of their mother's telomeres. Currently there may be issues with intra-chromosomal telomeric repeats in humpback whale DNA, therefore we are testing a new technique that targets chromosome ends only.

*Genotype matching (Debbie Steel)*

Debbie Steel provided updated results of the genotyping of samples collected from the South Pacific. This work builds on existing work by many people, Carlos Olavarria, Claire Garrigue and the RNHP funded work presented last year. A total of 300 samples (sloughed skin and biopsy samples) were collected from New Zealand (2003-2007), Samoa (2007), American Samoa (2003-2007) and French Polynesia (2005-2007). Up to 17 microsatellite loci were amplified and scored for each sample, along with sex and mitochondrial (mt) DNA control region sequences. Microsatellite loci and allele-binning followed standard protocols used in the previous analysis and developed in collaboration with researchers involved in similar studies of humpback whales from Western Australia and the east coast of Australia. This stage of the analysis was primarily funded by a Markham grant awarded to Renee Gibb, a Masters student at Oregon State University.

## **NEW INITIATIVES**

*Surveys in Tuvalu (Mike Donoghue, Annie Wheeler, Simon Childerhouse)*

Two periods of fieldwork were carried in Tuvalu in 2008. A research team visited the two southern most islands of Tuvalu – Nukulaelae and Niulakita – during five days in May, with the primary aim of investigating marine biodiversity values at Niulakita for the Tuvalu Government. Viliamu Iese carried out cetacean surveys at Nukulaelae and gathered anecdotal reports of sightings and strandings at both

islands. No cetaceans were observed, although villagers reported spinner dolphins frequenting the main lagoon passage at Nukulaelae, and recent (during the last five years) strandings of three unidentified whales at Nukulaelae and a whale (possibly a beaked whale) at Niulakita. A planned three week period of surveys at all of Tuvalu's outer islands in August/September was not conducted because of a combination of logistical difficulties and unfavourable weather conditions. A total of 57.6 hours of cetacean research effort, mostly within Funafuti lagoon, was carried out by Simon Childerhouse and members of the Tuvalu research team in September. This resulted in 3 sightings of spinner dolphins, and the collection of one skin sample for genetic analysis. Villagers also reported sightings of minke whales and killer whales in the vicinity of the lagoon in recent months. A full report on the findings of the three-year marine research and capacity building programme in Tuvalu will be available from the Department of Conservation in April 2009. The research has focused on cetaceans, sharks, turtles and rays and has been funded by NZAID with support from DOC, SPWRC, Auckland University, USP, IFAW and other partners.

*Tursiops aduncus* IUCN meeting update (Marc Oremus)

A summary was given of the workshop "Assessment Workshop on Indo-Pacific Bottlenose Dolphin (*Tursiops aduncus*)", held under auspices of the Cetacean Specialist Group, Species Survival Commission, International Union for Conservation of Nature (IUCN), and hosted by SPREP in Apia, Samoa, 21-23 August 2008. This workshop was motivated by the recent live-captures and holding in captivity of Indo-Pacific bottlenose dolphins (*Tursiops aduncus*) from the Solomon Islands, which has generated concern about the potential conservation implications of such removals. The Consortium discussed possible approaches to designing a research program to address these issues and resolved to work closely with the Solomon Islands Government, if requested to do so, in its implementation.

*Small cetaceans in South Pacific; focus on New Caledonia* (Marc Oremus, Claire Garrigue)

Two species of dolphins, *Tursiops aduncus* and *Stenella longirostris*, are commonly observed year-round in the lagoon of New Caledonia. However, there is very little knowledge of the status of these populations. A project was initiated in May 2008 by Opération Cétacés with the objectives of investigating distribution, habitat use, population structure, genetic diversity and population abundance of these two species. To date, eight different sites were visited around the main island, representing a total of 93 days on the field. In 2008, biopsy samples and photo-identification data were collected from 65 groups of *T. aduncus* and 14 groups of *S. longirostris*. Historical data collected opportunistically since 1995 were also added to the dataset. A photo-ID catalogue for *T. aduncus* in New Caledonia has been compiled and now comprises 302 distinct individuals, 118 of which have been seen more than once. High resight levels at a local scale over a long time period (up to 10 years) suggest that several communities of *T. aduncus*, demographically independent, live around New Caledonia. Although no abundance estimates are available yet, the data suggest that these communities are rather small, in the order of low hundreds at most. Preliminary genetic analysis of the mitochondrial DNA control region indicates a strong level of population structuring, largely consistent with photo-identification data. This suggests limited maternal gene flow between neighbouring communities. Nuclear markers will be analysed to investigate male gene-flow. This project will continue in 2009 to complete data collection around the country. This will allow us to refine our understanding of dolphin population structure in New Caledonia and provides some abundance estimates for some communities. Although, to date, more progress has been made on Indo-Pacific bottlenose dolphins, similar analyses will be conducted on spinner dolphins. Results from this study are expected to provide valuable information on the population dynamics of small cetaceans in the Pacific Islands Region. This knowledge could be useful for the assessment of population status in areas with a similar environment and similar species, such as the Solomon Islands.

## OTHER ISSUES

*JARPA II and IWC* (Phil Clapham, Nick Gales)

Clapham and Gales summarised the current situation with the IWC and whaling under special permit ("scientific whaling"). JARPA II (Japan's scientific whaling programme in the Antarctic) continues although lower catch levels have been achieved over the past two years due to logistical problems and the controversial actions of Sea Shepherd. Humpbacks remain targets under the conditions of the Special Permit issued by the Government of Japan, but assurances have been provided that humpbacks will not be taken as long as the "Future of the IWC process" continues.

#### *Soviet whaling in the Southern Ocean*

Recently, a memoir on Soviet whaling was published in the journal *Marine Fisheries Review*; the memoir, translated by Yulia Ivashchenko and edited by Ivashchenko, Clapham and Brownell, is available free of charge at: <http://spo.nmfs.noaa.gov/mfr702/mfr702.html>. Clapham noted that additional papers on Soviet whaling, including the entire post-war catch record for humpback whales, will shortly be published in the same journal.

### **REGIONAL UPDATES FOR 2008 SEASON**

#### *French Polynesia (Michael Poole)*

The first whales were observed on 04 July, but no other whales were observed until 24 July. Boat-based observational surveys commenced on 24 July and continued until 28 November when the last whale was observed. Boat surveys were conducted on a 6m dedicated research vessel and on an 11m platform of opportunity (whale watching vessel). 149 pods containing 249 whales (of which 27, 10.8%, were calves) were observed on 68 (78%) of the 87 survey days. Mean pod size was 1.7 whales/pod. When days during which the whale watch boat could not leave the lagoon (due to sea state conditions or other constraints) were removed from the data set, the results were as follows: 134 whales (of which 24, 10.6%, were calves) in 226 pods were observed during 62 (90%) of 69 survey days. A is unusual at Moorea, humpback whales were sometimes accompanied by spinner dolphins, rough-toothed dolphins, melon-headed whales, and pilot whales. 88 whales were photographically identified. These photographs have not yet been reconciled with past seasons. A total of 53 sloughed skin samples were obtained during the 2008 season. 7.5 hrs of song were recorded. There were no reports of humpbacks in the Marquesas Islands. There were sporadic reports of whales in the Tuamotu Archipelago. Plans for 2009 are to conduct boat-based surveys in the Tuamotu islands. Rawiri Paratene, a Trustee of the SPWRC, visited Poole's research at Moorea twice during the 2008 season. Ellen Garland from the University of Queensland, Australia came for four weeks and recorded humpback whale song. Renee Gibbs from Oregon State University came for four weeks to work on the photo-ID catalogue and assist with boat surveys. On 19 September an adult female *Peponocephala* stranded dead on Moorea's east coast. Histological samples were collected and the cadaver was placed in a freezer for a later necropsy.

#### *Cook Islands (Nan Hauser)*

During the 2008 whale research field season we experienced the worst weather that the fishermen had seen in the past 30 years. The wind blew between 30 to 60 knots consistently for weeks which made for a very difficult season. Besides being so rough, windy and rainy, there were fewer whales than usual. The first humpbacks (mother, juvenile and escort) were observed on July 15 and the last sighting of whales during the field season was on November 1<sup>st</sup>. In total, we undertook 90 days at sea covering 544.1 hours of field effort at sea. During this time, we had 60 encounters with 102 whales (comprising 27 singles, 12 pairs, 3 trios, 15 mother and calf pairs, 4 mother/ calf/ escort, 1 competitive group and 9 singers). Overall, singing was heard on only 6 days (4 complete cycles of song recorded). We collected 17 DNA samples (including a sperm sample in alcohol and also in frozen sea water). On December 15<sup>th</sup> a mother and calf were observed off Rarotonga. A newborn humpback stranded on Mauke on Saturday August 9<sup>th</sup>, 2008 and photographs and samples were collected. A female humpback with a calf arrived on October 3. The mother rested with her tail out of the water for 15 to 20 minute periods before flipping upright and taking a breath. She displayed this behaviour for 5 days. In addition to humpback whales, spinner dolphins, sperm whales and *Mesoplodon densirostris* were seen and minke whale vocalizations were heard. 2 whale sharks along with a large unknown baleen whale skim feeding at the surface (September 30 and October 1) were observed and reported by Air Rarotonga pilots. The Cook Islands Whale Research & Education Centre continues to attract locals, tourists, educators, government officials and children. Besides after school programs and lectures, we ran specific projects including *Shark Week*, *Dolphin Week*, *Turtle Week* and *Whale Week*. Whale lectures were presented at the Crown Beach Resort every Monday night from July to October.

#### *Tonga (Kirsty Russell, Aline Schaffer, Rochelle Constantine, Lole Lui)*

##### Vava'u, Kingdom of Tonga 2008 Field Season

The field season for Vava'u, Kingdom of Tonga for 2008 was considerably reduced from previous years due to reduced funding. The field season was run by Kirsty Russell with the assistance of local and visiting volunteers. Pre- and post-field season logistics and fluke matching were undertaken by Rochelle Constantine and Kirsten Thompson.

This year a small (6 metre) motor boat was utilised as the research vessel and was skippered by Gary Morse. Due to weather conditions and the use of a smaller vessel than previous years, most of the research was restricted to within and close inshore around the islands of Vava'u.

Data collected:

The field season was run between 7<sup>th</sup> September and 13<sup>th</sup> November with a total of six days on the water. Additional data was collected opportunistically within this period.

A total of 24 sightings of cetaceans were made during the season. One sighting was with a group of common dolphins and the remaining 23 groups were of humpback whales.

Of the 55 whales sighted, fluke images of 13 individuals were added to the Vava'u catalogue for the 2008 season. Two 2008 whales have been sighted in Vava'u waters in previous years; one whale was sighted on six previous years dating back to 1998 and the other whale was sighted previously in 2006. Eight skin biopsy samples and one acoustic recording were also collected.

Lole Lui (Vava'u Tourism Association (VTA)) provided a summary of issues in Tonga. He highlighted that a new CEO is being sought for the Tongan Visitor Bureau (TVB) and that they were looking for support from SPWRC to help with development of whale watching regulations. There were three sightings of pilot whales in the inshore waters of Vava'u, including two events when a mother and calf came into the Harbour. He also said that the VTA was looking for advice from SPWRC about future permitting issues and that the Government was looking at setting up fines of up to \$50k for breaking regulations.

A. Schaffar completed nine days of land based survey from Mo'ungalafa, Vava'u, Tonga from the 15<sup>th</sup> to the 23<sup>rd</sup> of October 2008. A total for 54 pods of humpback whales were sighted, of which 13 were tracked using a theodolite. 77% of the groups tracked consisted of mother-calf pairs.

*Tonga – Ha'apai (Megan Kessler)*

During August and September 2008, Macquarie University, working with Happy Ha'apai Divers, conducted research in the Ha'apai group with the following aims:

1. Investigate current tour operations in Ha'apai as an example of swim with whale programmes in Tonga.
2. Test the appropriateness of research methods currently used in Australia to investigate whale watching in Tongan waters.
3. Examine whether there is a difference in whale behaviour around whale watching vessels with swimmers or without swimmers in the water
4. Using information obtained during this pilot study, develop an ongoing research program on whale watching and swim with whale programs in Tongan waters
5. Develop a database for whale identification photographs that will make this research available to Tonga whale watchers and contribute to humpback migration research in the South Pacific.
6. Contribute information that will help to identify the mechanisms that would encourage sustainable whale watching tourism growth in Tonga.

*New Caledonia (Claire Garrigue, Aline Schaffar)*

Surveys were conducted from a small motor boat in July and August 2008. In 35 days only two humpback whales were observed on the east, west and southwest lagoons. In 2007, the use of satellite telemetry allowed the identification of a new potential habitat for humpback whales situated 60 NM south of Ile des Pins. This season (2008), a cruise was conducted from the 10<sup>th</sup> of September to the 3<sup>rd</sup> of October in order to investigate this location: the seamount of Antigonie. This seamount is in the middle of the ocean, and the summit is only 50 m below the surface. A total of 18 days totalling 130 hours of observation were spent at sea but due to bad weather only 6 days were used to cruise on the seamount. Over the entire time at sea six species were observed. Humpback whales were mainly seen on the seamount and not during transit. A total of 115 whales were counted, 50 of which were photo identified. 32 are new individuals, 18 (35 %) have already been identified in New Caledonia. All kinds of social group were encountered (single, pod of 2 of 3 to 4, competitive group, mother and calf alone or with escort and competitive groups) clearly showing that the seamount is used for a reproductive purpose. During the whole 2008 season, 76 biopsies samples of humpback whales were collected and 14 song sessions were recorded totalling 12h of song. Biopsy samples were also collected on small cetaceans. In 2008, 4 pygmy sperm whales and 2 dugongs stranded.

Aline Schaffar undertook land based surveys at the Cap Ndoua from the 13<sup>th</sup> of July to the 7<sup>th</sup> of September 2008, totalling 50 days comprising 300 hours of observation. During this survey, 234 pods of humpback whales were sighted, of which 96 were tracked using the theodolite. Tracks of whales were completed in the presence and in the absence of boats. Most of the groups tracked were singletons



or pairs of animals. In order to assess boat traffic in the study area, boat scans were conducted at fixed times, three times a day. A total of 61 scans were conducted, within which the position of 769 boats was recorded. The average number of boats recorded per day has shown a constant increase since 1997. In 2008, 26 boats were used to conduct 360 commercial whale watching tours, with approximately 4425 participants. The growth of the whale watching industry is slowing down and the demand for this type of activity may have reached its maximum considering participants are mainly residents of New Caledonia.

#### *Samoa (Juney Ward)*

Two surveys were conducted in Samoa in 2008. The first was a follow-up survey similar to the one conducted in 2007 by Marc Oremus, which also focused on the feasibility of a whale/dolphin watching industry around the north-western coast of Savaii island. The first survey was done over a period of four days in May and covered a total distance of 299km. Nine pods which included spinner dolphins, sperm whales and unidentified delphinids were encountered. Tissue samples were collected from spinner dolphins (4) and sperm whales (1). The second survey was conducted over six days in October around the southern coast of Upolu island. The total distance covered was 419km in which six humpback whales (13 individuals) and three spinner dolphin groups (55-63 individuals) were encountered. Only 2 unique flukes and tissue samples were collected during this survey period. The encountered humpback whales had not been seen in previous years; however 2 individuals were seen on multiple days.

Two single animal strandings occurred in 2008. The first stranding was a melon-headed whale which was identified from photographs. No tissue samples were collected. The second stranding was reported on the 23<sup>rd</sup> December, a single animal which is most likely a sperm whale. Tissue samples and photographs were taken. In January, we discovered another single animal stranding which most likely occurred during December. Samples were collected and are now with the University of Auckland for genetic analysis.

The Marine Wildlife Protection Regulation 2008 has been approved by Cabinet and the Marine Conservation Section will be carrying out consultation with stakeholders and communities to address the regulation. A stranding manual has been finalized and awareness activities and programs will be implemented to further improve the reporting of strandings by the general public.

Field survey work for 2009 will be dependent on the availability of funds. However, it is important that the survey is continued to build on the existing research and knowledge of these mammals for Samoa.

#### *American Samoa (Jooke Robbins)*

In 2008, humpback whale research continued at American Samoa through a collaborative effort by the Hawaiian Islands Humpback Whale National Marine Sanctuary, the Provincetown Centre for Coastal Studies, the American Samoa Department of Marine and Wildlife Resources and the Fagatele Bay National Marine Sanctuary. Coastal surveys were carried out from 8 October through 22 October, concurrent with separate surveys at Samoa. Despite poor weather, 53 humpback whale groups were encountered in 10 days at sea. In total, 72 unique individuals were identified by their dorsal fins and flukes of 40 individuals were expected to pass SPLASH quality screening. Excluding calves, 12.3% of individuals were seen on more than one day during the season. There was also one match to a whale first catalogued in 2003, based solely on dorsal fin. Whales at American Samoa exhibit a significantly higher frequency of certain types of skin lesions than humpback whales in the North Atlantic, but are more comparable to those in the North Pacific. The nature and cause of the lesions remain under investigation.

#### *Niue (Olive Andrews)*

A total of 66.5hrs effort over 11 days between 9 – 21 August, 2008 were conducted from a 5m power boat with 3 observers. The survey encountered a total of 43 adult and 3 calf humpback whales, as well as 1 minke, 2 unidentified whales and 58 spinner dolphins. Three sloughed skin samples were collected, 5 unique fluke ID photos and 11 dorsal fin ID photos were taken. Prevailing conditions and size of the boat limited the amount of collectable data on the whales that were encountered, however the survey was celebrated by the Niue Government, community and NGO supporters.

*New Zealand (Nadine Bott)*

Nadine Bott ran a four week humpback whale survey in Cook Strait in June – July 2008. This is was the fifth year of this research programme. A total of 37 humpback whales were sighted over 25 days of survey. Eight photo identification and 16 biopsy samples were collected and added to the South Pacific Whale Research Consortium databases. One resight was observed which is the first between season resight for Cook Strait. In addition, four pygmy blue whales (species to be confirmed by genetic analysis) were sighted during the survey. Nadine Bott coordinates the New Zealand Humpback Whale Catalogue. There were 47 anecdotal sightings of humpbacks around New Zealand in 2008, of which two new photo IDs were obtained. The catalogue now stands at 60 photo IDs. One resight of a mother-calf in Hauraki Gulf was matched with sightings of the same mother seen in 2004 at Leigh and in 2002 at Bay of Islands (both times also with a calf). One new match with Norfolk Island was made, and three new matches with Hervey Bay.

*Norfolk Island (Adrian Oosterman)*

A 12 week whale survey was conducted in 2008. The survey was conducted from the 23<sup>rd</sup> August to the 13<sup>th</sup> November. In previous surveys (2003-2007), such a lengthy survey had not been conducted. A total of 492hrs were spent on-effort at land stations during the 2008 Norfolk Island Whale Season (NIWS). This figure excludes survey time lost to inclement weather. During the course of the 2008 survey, 94 pods were observed, comprising of 114 humpbacks (31 of which were calves), 13 minke and 20 unidentified large cetaceans; Ten re-sights of humpback occurred and these have been excluded from the final analysis. Significantly, two cow/calf pods were seen over extended periods; one pod for six days and another for ten days. Land-based work was complemented by 21.5hrs of vessel-based observations. Of the humpback whales recorded, 27.2% were calves. The number of humpback whales observed passing the study site was considerably higher than previous years, peaking late in the survey (essentially the last 3 weeks of October and the first week of November). In 2006 the NIWS selected an earlier 28-day time frame, during which eight humpbacks were observed. Nevertheless, for the corresponding period in 2008 the team recorded 21 humpbacks (a 263% increase in 2 years). For the most part, key observation points used in 2006 and 2008 were situated on the north-west corner of the island and were of a northerly aspect. There were two new photo-ID matches between Norfolk Island and New Caledonia.

*Hervey Bay (Trish and Wally Franklin)*

The sampling effort in Hervey Bay during 2008 extended over 10 weeks (10th August -17th October), for a total of 480 hours effort over 60 working days. 494 pods were sampled and 1218 humpback whales were observed and photographed. The Hervey Bay Catalogue for the period 1992-2005 has been fully reconciled for intra-season and inter-season re-sights, quality scored and contains 1961 flukes. The photo-id analysis and reconciliation of the 2006/07/08 photography will be completed by mid-2009. It is expected to yield a further 810 flukes, bringing the 1992-2008 Hervey Bay Catalogue to an estimated 2771 quality scored flukes. During the 2008 season 51 sloughed skin samples were collected bringing the total sloughed skin samples collected in Hervey Bay, between 2000 and 2008, to 1451. A total of 149 hydrophone drops, each of 15 minutes duration and distributed across the season, were completed. Singing and/or social sounds were present and recorded on approximately 96% of drops.

*Eden NSW (Dave Paton, Nick Gales)*

A collaborative research program involving the Australian Marine Mammal Centre, Australian National University, Blue Planet Marine and Marine Mammal Research commenced at Eden (south eastern Australia) during 2008. This project was funded by the Australian Marine Mammal Centre (AMMC) with additional funding through the AMMC grant scheme.

During 2008 there were two field seasons with the objective of addressing humpback whale stock structure and movement patterns. Field trip 1 was from June 24 – 30, 2008 during the northern humpback whale migration with a focus on collection of biopsy samples and fluke identification data. Survey effort was 48hrs 3mins with a total of 17 pods containing 50 humpback whales observed. Forty five biopsies and 33 fluke ids were collected. Field trip 2 was from 24 October – 2 November, 2008 during the southern humpback whale migration with a focus on satellite tagging. Survey effort was 75hrs 13 mins with a total of 71 pods containing 170 humpback whales observed. Sixteen satellite tags were deployed, 19 biopsies, 14 fluke ids and 7 song samples were collected.

A one month field season is proposed to be undertaken on the east coast of Australia (location to be confirmed) during June 2009 with a focus on collecting genetic samples with the primary focus of assessment of the development techniques for the aging of baleen whales.

*Humpback Acoustic Research Collaboration (HARC) 2008 - Peregrine Beach Sunshine Coast Qld Australia. (Mike Noad, Rebecca Dunlop and David Paton)*

HARC is a comprehensive, multi-scale, collaborative study of migrating humpback whales off the Australian east coast. The project is coordinated by the Cetacean Ecology and Acoustics Laboratory, University of Queensland in collaboration with a range of organisations including Australian Defence Science and Technology Organisation among others with funding, in 2008, from the Australian Marine Mammal Centre grants scheme.

The aims of HARC include to, assess how humpback whales interact with their acoustic environment

- the physical environment
- the social environment
- how the whales interact with the environment in the presence and absence of anthropogenic noise

Fieldwork related to this project has been conducted during 2002 – 2004 and 2008.

During the 2008 field season there was 4 weeks of field work between 20 Sept & 19 Oct 2008. During this period there were 23 controlled exposure experiments using humpback whale social sounds and frequency modulated sounds conducted, 3 D-tags deployed and a large number of humpback whales tracked visually and acoustically through the study site. Due to the large volume of data collected during the 2008 field season, data analysis is still under way.

Further work building on the data collected during the HARC project is proposed at Peregrine Beach study site during September/October 2009.

*Fiji (Dave Paton, Aisaki Batibasaga)*

The 2008 Fiji Whale and Dolphin survey was conducted by Blue Planet Marine working in collaboration with the Fiji Department of Fisheries with funding support by IFAW, Fiji Department of Fisheries and Blue Planet Marine. This was a collaborative study replicating Dawbin's surveys from the 1950's to assess the current humpback whale population in the Lomaiviti Island Group of Fiji, build awareness and capacity within Fiji, and to assist the Fiji Government with the supply of current information on whales and dolphins within their waters. The work was conducted over 19 days (16th Aug to 3 Sept 2008) during the historical peak of humpback whale sightings (determined from Dawbin's historical data) from Levuka on Ovalau Island within the Lomaiviti Island group of Fiji. Survey Effort - Land based survey 176 hours 49min (average 9.3 hours/day); Vessel survey 23 hours 15min (opportunistic when cetaceans were sighted). A total of 28 pods of cetaceans were sighted during the survey. These included eight pods of humpback whales (*Megaptera novaeangliae*) (18 individuals), three pods of short finned pilot whales (*Globicephala macrorhynchus*) (~80 whales), one pod of false killer whales (*Pseudorca crassidens*) (ten whales), three pods of blackfish (species unconfirmed) (~32 whales), eight pods of spinner dolphins (*Stenella longirostris*) (ten dolphins), unidentified small cetaceans (two pods, six dolphins), unidentified cetacean (two pods, two whales). A total of ten humpback whale fluke identifications were collected during 2008. One of these was a within season resight, none were between years resights. This brings the total fluke identifications to 12 for Fiji (2002, 2003 and 2008). Five sloughed skin genetic samples were collected from two humpback whales and a stranded blackfish. Nine acoustic samples of humpback song and odontocete communications were also collected. The 2008 survey detected an increase in the number of humpback whales within Lomaiviti Island group however it is still well below the number of sightings recorded during the peak of sightings recorded in the 1950's. The survey also confirmed the presence of bottlenose dolphins within Fijian waters.

## Publications, Major Reports and Conference Presentations 2008/09

### *Peer reviewed publications (including in press and in review)*

- Brownell, R., Ralls, K., Baumann, S., Poole M. Behavior of melon-headed whales near oceanic islands. *Marine Mammal Science* (In Press)
- Clapham, P., Mikhalev, Yu., Franklin, W., Paton, D., Baker, C.S., Ivashchenko, Y.V. & Brownell, R.L. Jr. (in Press). Catches of humpback whales by the Soviet Union and other nations in the Southern Ocean, 1947-1973. *Marine Fisheries Review*
- Franklin, T., Smith, F., Gibbs, N., Childerhouse, S., Burns, D., Paton D., Franklin, W., Baker, C.S. and Clapham, P. (in review). Migratory movements of humpback whales (*Megaptera novaeangliae*) between eastern Australia and the Balleny Islands, Antarctica, confirmed by photo-identification. *Journal of Cetacean Research and Management*
- Franklin, W., Franklin, T., Gibbs, N., Childerhouse, S., Garrigue, C., Constantine, R., Brooks, L., Burns, D., Paton, D., Poole, M., Hauser, N., Donoghue, M., Russell, K., Mattila, D., Robbins, J., Anderson, M., Olavarria, C., Jackson, J., Noad, M., Harrison, P., Baverstock, P., Leaper, R., Baker, C.S. and Clapham, P. (in review). Eastern Australia (E1 breeding grounds) may be a wintering destination for some Area V Humpback Whales (*Megaptera novaeangliae*) migrating through New Zealand waters. *Journal of Cetacean Research and Management*
- Garrigue, C., Zerbini, A., Geyer, Y., Heidi-Jørgensen, M.P. & Clapham, P. (in review). Movements of satellite-monitored humpback whales from New Caledonia. *Journal of Mammalogy*
- Garrigue, C., Baker, C.S., Constantine, R., Poole, M., Hauser, N., Clapham, P., Donoghue, M., Russell, K., Paton, D., Mattila, D.K. & Robbins, J. (in review). Interchange of humpback whales in Oceania (South Pacific). *Journal of Cetacean Research and Management*
- Garrigue, C., Franklin, T., Russell, K., Burns, D., Poole, M., Paton, D., Hauser, N., Oremus, M., Constantine, R., Childerhouse, S., Mattila, D., Gibbs, N., Franklin, W., Robbins, J., Clapham, P. & Baker, C.S. (in review). First assessment of interchange of humpback whales between Oceania and the east coast of Australia. *Journal of Cetacean Research and Management*
- Garrigue, C., Constantine, R., Poole, M., Hauser, N., Clapham, P., Donoghue, M., Russell, K., Paton, D., Mattila, D.K., Robbins, J. and Baker, C.S. (in review). Movement of individual humpback whales between wintering grounds of Oceania (South Pacific), 1999 to 2004
- Hauser, N., Zerbini, A., Geyer, Y., Heidi-Jørgensen, M.P. & Clapham, P. (in review). Movements of satellite-monitored humpback whales from the Cook Islands. *Marine Mammal Science*
- Oremus M., Gales R., Dalebout M., Funahashi N., Tetsuya E., Kage T., Steel D. and Baker C.S. (in review). Worldwide mtDNA diversity and phylogeography of pilot whales (*Globicephala* spp.). *Molecular Phylogenetics and Evolution*
- Paton, D., Brooks, L., Burns, D., Franklin, T., Franklin, W., Harrison, P., Baverstock, P. (in Press). Abundance of east coast Australian humpback whales (*Megaptera novaeangliae*) in 2005 estimated using multi-point sampling and capture-recapture analysis. *Journal of Cetacean Research and Management*

### *Presentations at International Conferences*

- Garland, Ellen C.; Baker, C. Scott; Cato, Douglas; Constantine, Rochelle; Donoghue, Michael; Garrigue, Claire; Goldizen, Anne; Hauser, Nan; Mattila, David; Poole, Michael; Robbins, Jooke and Noad, Michael J. Dynamic shifts in humpback whale song in the South Pacific Ocean. 17th Biennial Conference on Marine Mammals, November 2007, Cape Town, South Africa.
- Garrigue, C.; Baker, C.S.; Burns, D.; Childerhouse, S.; Clapham, P.; Constantine, R.; Donoghue, M.; Franklin, T.; Franklin, W.; Gibbs, N.; Hauser, N.; Russell, K.; Mattila, D.; Oremus, M.; Poole, M.; Paton, D.; Robbins, J. 2007. Isolation and interchange among humpback whales on breeding grounds and migratory corridors of the South Pacific. 17th Biennial Conference on Marine Mammals, November 2007, Cape Town, South Africa.
- Jackson, J.A., Garrigue, C., Hauser, N., Poole, M., Constantine, R., Clapham, P., Madon, B., Zerbini, A., Baker, C.S. 2007. Reconstructing the history of exploitation and recovery for humpback whales in the South Pacific. 17th Biennial Conference on Marine Mammals, November 2007, Cape Town, South Africa.
- Madon, B.; McArdle, B.; Baker, C.S.; Garrigue, C. 2007. Joint modeling of two sources of live recapture data applied to South Pacific Humpback whale (*Megaptera novaeangliae*)

- population. 17<sup>th</sup> Biennial Conference on Marine Mammals, November 2007, Cape Town, South Africa.
- Oremus M., Gales R., Dalebout M.L., Funahashi N., Endo, T., Steel D. & Baker C.S. Worldwide mtDNA phylogeography and diversity of pilot whales species (*Globicephala* spp.). 17<sup>th</sup> Biennial Conference on the Biology of Marine Mammals. Cape Town, South Africa, November 2007. AWARD for the best student presentation overall.
- Paton, D.A., Gibbs, N., Childerhouse, S and Clapham, P. 2007. Assessment of the current abundance of humpback whales in the Lomaiviti Island Group of Fiji and a comparison with historical data. Poster at the 17th Biennial Conference on Marine Mammals, November 2007, Cape Town, South Africa.
- Schaffar, A., Garrigue, C., O'Connor, S.; Dodemont, R. 2007. Status of commercial humpback whale watching activities in the South Pacific Region. 17th Biennial Conference on Marine Mammals, November 2007, Cape Town, South Africa.

#### *Major reports*

- Childerhouse, S., Jackson, J., Baker C.S. Clapham, P., Gales, N. and Brownell R. 2008: Proposal to IUCN for a separate listing for Oceania sub-population of humpback whales.
- Oosterman, A. 2008. A review of the 2007 Norfolk Island Whale Survey.
- Oosterman, A. 2009. A review of the 2008 Norfolk Island Whale Survey.
- Paton, D., Batibasaga, A., Shama, S., O'Connor, W. and Nand, N. (2009). Report of the Whale and Dolphin Survey undertaken in the Lomaiviti Island Group, Fiji 2008

#### *Papers presented to the IWC Scientific Committee.*

- Franklin, T., Smith, F., Gibbs, N., Childerhouse, S., Burns, D., Paton D., Franklin, W., Baker, C.S. and Clapham, P. 2007. Migratory movements of humpback whales (*Megaptera novaeangliae*) between eastern Australia and the Balleny Islands, Antarctica, confirmed by photo-identification. SC/59/SH18 Report to the IWC Scientific Committee
- Garrigue, C. Baker, C.S., Constantine, R., Poole, M., Hauser, N., Clapham, P. Donoghue, M., Russell, K., Paton, D., Mattila, D. and Robbins, J. Interchange of humpback whales in Oceania (South Pacific), 1999 to 2004 (revised SC/A06/HW55 march 2007) SC/59/HW14.
- Garrigue, C., Franklin, T., Russell, K., Burns, D., Poole, M., Paton, D., Hauser, N., Oremus, M., Constantine, R., Childerhouse, S., Mattila, D., Gibbs, N. Franklin, W. Robbins, J., Clapham, P. & Baker, C.S. 2007 First assessment of interchange of humpback whales between Oceania and the east coast of Australia. South Pacific Whale Research Consortium , SC/59/SH15.
- Hauser, N., Zerbini, A., Geyer, Y., Heide-Jorgensen, M-P., Clapham, P. 2007. Migratory destination of a humpback whale satellite-tagged in the Cook Islands SC/59/SH12
- Schaffar, A. Garrigue, C. 2007. Review of commercial humpback whale watching activities in the South Pacific. IWC/59/8 Agenda item 13.
- Albertson-Gibb, R., Antolik, C., Olavarria, C., Garrigue, C., Hauser, N., Poole, M., Brasseur M., Steel D., Baker C.S. Using mitochondrial DNA and mixed stock analysis to describe migratory allocation of humpback whales from Antarctic feeding areas to South Pacific breeding grounds. Report SC/60/SH15 to the Scientific Committee of the International Whaling Commission, 2-15 June, Santiago, Chile.
- Clapham P, Garrigue C., Hauser N., Geyer Y., Zerbini A. 2008 Movements of satellite-monitored humpback whales from New Caledonia and the Cook Islands. Report to the IWC Scientific Committee SC/60/SH34
- Franklin, W., Franklin, T., Gibbs, N., Childerhouse, S., Garrigue, C., Constantine, R., Brooks, L., Burns, D., Paton, D., Poole, M., Hauser, N., Donoghue, M., Russell, K., Mattila, D. Robbins, J., Anderson, M., Olavarria, C., Jackson, J., Noad, M., Harrison, P., Baverstock, P., Leaper, R., Baker, C.S. and Clapham, P. (2008) Eastern Australia (E1 breeding grounds) may be a wintering destination for some Area V Humpback Whales (*Megaptera novaeangliae*) migrating through New Zealand waters. SC/60/SH3
- Jackson, J.A., Zerbini, A., Clapham, P., Constantine, R., Garrigue, C., Hauser, N., Poole, M., Baker, C.S. Progress on a two-stock catch allocation model for reconstructing population histories of east Australia and Oceania. Report SC/60/SH14 to the Scientific Committee of the International Whaling Commission, 2-15 June, Santiago, Chile.
- Schaffar, A., and Garrigue, C. (2008) Exposure of humpback whales to unregulated tourism activities in their main reproductive area in New Caledonia. IWC SC60/WW8

Steel, D., Garrigue, C., Poole, M., Hauser N., Olavarria, C., Florez-Gonzalez, L., Constantine, R., Caballero, S., Thiele, D., Paton, D., Clapham, P., Donoghue, M., Baker, C.S. Migratory connections between humpback whales from South Pacific breeding grounds and Antarctic feeding areas demonstrated by genotype matching. Report SC/60/SH13 to the Scientific Committee of the International Whaling Commission, 2-15 June, Santiago, Chile.

**Table 1** Summary of photo-identification matches made between regions when comparing animals photographed in 2007 to all previously photographed individuals. Notation: TGVA – Tonga, Vava’u; AS – American Samoa; CI – Cook Islands; SA – Samoa; NZ – New Zealand; FP – French Polynesia; NC – New Caledonia; Nor.I – Norfolk Island; Ker.I – Kermadec Islands

	TGVA	AS	CI	SA	NZ	FP	NC	Nor.I	Ker.I	Balleny
<b>TGVA 2007</b>	X		1							
<b>AS 2007</b>		X				1				
<b>CI 2007</b>	1		X			1				
<b>SA 2007</b>				X						
<b>NZ 2007</b>					X					
<b>FP 2007</b>			1			X				
<b>NC 2007</b>	1	1			1		X			
<b>Nor.I 2007</b>								X		
<b>Ker.I 2007</b>									X	