Research History - Pacific Whale Foundation in Australia

Pacific Whale Foundation has been studying **humpback whales** in East Australia since 1984 to gather information about the population's biology, abundance, migratory trends, recruitment rates, and age-related distribution patterns. Our research in Australia is primarily conducted in Hervey Bay, Queensland, Australia; a crucial habitat for humpback whales on their annual migration to Antarctica.

Pacific Whale Foundation was the first organization to conduct photo-ID research in Hervey Bay and has influenced state and commonwealth policies on whale protection in the area by contributing to the scientific literature. Research efforts include maintaining an identification database of the South Pacific humpback whale population, which provides essential information to current and future whale management and conservation programs in the Southern Hemisphere.

Our initial work in East Australia involved the collection of both fluke IDs and whale song recordings. Although we no longer gather recordings of humpback whale songs, these initial recordings were some of the first that were compared to Hawaii's whales in an attempt to understand the global significance of songs for humpback whales. After several years of data collection, we began to address questions on the population dynamics of the East Australia humpback whales, dynamics which are still evolving and continue to guide our current studies.

Our researchers were among the first to document the albino humpback whale known as Migaloo and published articles detailing behavioral observations and his movements along the East Australia migratory route.

Pacific Whale Foundation has also played a key role in developing whalewatch tourism around the world and educating vessel operators on safe maneuvering around marine mammals ('Be Whale Aware' was developed by PWF and has been adopted by the Queensland government).

Although the focus of our research has always been Hervey Bay, we have also looked at movement and connectivity among areas in various East Australia locations. Dedicated research surveys, along with donated photos from whalewatch operators, have enabled us to analyze movement of humpback whales along their migration route: we have documented whales traveling between the Whitsundays/Cairns/Port Douglas region, to Hervey Bay, to Eden.

Our researchers were among the first to document feeding behavior along the migration route. We reported the results of long-term observations of opportunistic humpback whale feeding behavior off Eden, New South Wales between 1995 and 2010. This is the most extensive record of extralimital feeding currently in existence for this area.

Through photo-identification, we have documented migratory movements of individual animals and have played a key role in discovering interchange among populations. We reported on inter-ocean movement of a humpback whale between the Pacific Ocean, east Australia and the Indian Ocean, west Australia; which was confirmed by photo-ID. This report is the first and only paper that demonstrates a whale moving between these two populations; which are otherwise thought to be separate.

The focus of our **current work** is on (1) the distribution of mother-calf pairs in Hervey Bay and (2) the impacts of tourism on humpback whales.

Whale distribution study: We modelled the distribution of mother-calf pairs in Hervey Bay over a 12-year period and determined that there is spatial and temporal segregation of pods in this area based on pod composition. Adult- and juvenile-only pods were found further from shore and earlier in the season, while pods containing a calf showed a preference for nearshore waters off Fraser Island, and were found later in the season. Understanding habitat preference and patterns of area use in Hervey Bay have important implications for the protection and recovery of this population.

Swim-with-whales study: We are investigating the impacts of tourism on humpback whales in Hervey Bay. A commercial "swim-with whale" program has been recently permitted in Queensland, Australia and there is concern that this activity could cause disturbance to the targeted whale population. This study will assess the impact of commercial swim-with-whale activities on whale's behavior in a controlled impact study. The goal of this work will be to provide recommendations to managers to ensure this population of whales is not negatively impacted by tourism activities, and to provide tour operators with guidelines for best practices for this emerging activity.

Photo-Identification study: This long-term research is used to supplement our short-term studies. The humpback whale photo-identification (or photo-ID) project involves photographing and cataloging flukes, which are the underside of a humpback whale's tail. Each whale has unique features, including the overall shape of the flukes, the shape of the trailing edge, any acquired scars, and natural pigmentation patterns. By documenting individual whales, we know their reproductive history, behavioral observations, movement patterns, minimum age, and sighting rate. Through this catalogue, we aim to advance our understanding of humpback whale biology and population status to help further conservation and management efforts.

Ways To Get Involved in PWF Research

Donate Photos - We want your photos! The PWF research department receives photo donations from the public that we use to build our photo-identification catalogs for humpback whales in the South Pacific. We seek photos from: East Australia, Tonga, and Antarctica. Email your fluke (whale tail) photos

to research@pacificwhale.org with “Photo Donation” in subject line. All donation photos are cataloged with the name and contact information of the donor and we will notify you of any re-sightings that occur.

The photo donation page of our website (http://www.pacificwhale.org/donatephotos) has additional tips and suggestions for capturing high-quality, photos of marine mammals that are also useful for research.

Download the “Whale and Dolphin Tracker” app – Participate in our research as citizen scientists by submitting marine wildlife sightings from any location around the world.
https://www.pacificwhale.org/research/citizen-science/whale-and-dolphin-tracker

Donate to help fund our research – By becoming a member of our Honorary Research Team, you can support ongoing research at Pacific Whale Foundation.

http://www.pacificwhale.org/content/donate-help-fund-our-research

Adopt a whale – We have a number of whales from our South Pacific Humpback Whale Catalogue that are available for a symbolic adoption as a means of funding our ongoing research studies.
http://www.pacificwhale.org/content/adopt-whale-and-adopt-dolphin

Below you will find a summary of the papers and reports published by Pacific Whale Foundation that directly benefited the humpback whales on Australia’s east coast:

2019: Stack, S.H., McCordic, J.A., Machernis, A.F., Olson, G.L., Currie, J.J. Preliminary report on the impacts of swim-with-whale tourism on humpback whale behavior in Hervey Bay, Queensland, Australia. Document SC/68A/WW/02 presented to the IWC Scientific Committee, Nairobi, Kenya: 10 May-22 May. 22 pp.

2019. Stack, S.H., Currie, J.J., McCordic, J.A., Machernis, A.F., Olson, G.L. Distribution patterns of east Australian humpback whales (*Megaptera novaeangliae*) in Hervey Bay, Queensland: A historical perspective. Australian Mammalogy.

2015. Martinez, E., Currie, J.J., Stack, S.H., Easterly, S.K. and Kaufman, G.D. Note on patterns of area use by humpback whales (*Megaptera novaeangliae*) in 2013 in Hervey Bay, Australia, with an emphasis on mother-calf dyads. Document SC/66a/SH/02 presented to the IWC Scientific Committee, San Diego, USA: 20 May – 4 June. 16 pp

2014: Constantine, R, Steel, D, Allen, J, Anderson, M, Andrews, O, Baker, CS, Beeman, P, Burns, D, Charrassin, J-B, Childerhouse, S, Double, M, Ensor, P, Franklin, T, Franklin, W, Gales, N, Garrigue, C, Gibbs, N, Harrison, P, Hauser, N, Hutsel, A, Jenner, C, Jenner, M-N, Kaufman, G, Macie, A, Mattila, D, Olavarria, C, Oosterman, A, Paton, D, Poole, M, Robbins, J, Schmitt, N, Stevick, P, Tagarino, A, Thompson, K, and Ward, J. Remote Antarctic feeding ground important for east Australian humpback whales. *Marine Biology*, 161: 1087-1093

2013: Rankin, R.W., Maldini, D. and Kaufman, G. Bayesian estimate of Australian humpback calving interval under sparse resighting rates: 1987 - 2009. *Journal of Cetacean Research Management:* 13(1):109-121

2011: Forestell, P., Kaufman, G.D. and Chaloupka, M. Long term trends in abundance of humpback whales in Hervey Bay, Australia. *Journal of Cetacean Research Management (Special Issue 3)*: 235-242.

2011: Kaufman, G., Coughran, D., Allen, J., Burns, D., Burton, C., Castro, C., Constantine, R., Childerhouse, S., Franklin, T., Franklin, W., Forestell, P., Gales, R., Garrigue, G., Gibbs, N., Jenner, C., Paton, D., Noad, M., Robbins, J., Slooten, E., Smith, F. and Stevick, P. Photographic evidence of interchange between east Australia (BS E-1) and West Australia (BS D) humpback whale breeding populations. Document SC/63/SH11 presented to the IWC Scientific Committee, Tromso, Norway: 11-14 July

2011: Silva, I.F., Kaufman, G.D., Hutsel, A., Macie, A., Maldini, D. and Rankin, R.W. Mid-migration humpback whale feeding behavior off Eden, NSW, Australia. Document SC/63/SH12 presented to the IWC Scientific Committee, Tromso, Norway: 11-14 July

2010: Jule, K. and Kaufman, G. Greenhouse effect? Evidence of apparent sun damage to East Australian humpback whales (*Megaptera novaeangliae*). 14a Reunião de Trabalho de Especialistas em Mamíferos Aquáticos da América do Sul y 8o Congresso da Sociedade Latinoamericana de Especialistas em Mamíferos Aquáticos, Florianópolis, Santa Catarina, Brazil: 24-28 October.

2010: Hoffman, W.S., Kaufman, G.D. and Jule, K. 2010. Estimation of Survival, Recruitment and Realized Growth Rates of the East Australia Humpback Population (BS-1) Using Temporal Symmetry Models. Document SC/62/SH14 presented to the IWC Scientific Committee, Agadir, Morocco: 21-25 June

2009: Gibson, Q., Kaufman, G. and Forestell, P. Status Report: Photo-Identification of Humpback Whales at Multiple Aggregation Areas along east coast Australia. Document SC/61/SH25 presented to the IWC Scientific Committee, Madeira, Portugal: 22-25 June.

2008: Gibson, Q., Kaufman, G. and Forestell, P. Two may be better than one: Association among east Australian humpback whale (*Megaptera novaeangliae*) mother-calf pairs on the southward migration. XIII Reunion de trabajo de Especialistas en Mamiferos Aquaticos del Sur y 7° Congreso SOLAMAC, Montevideo, Uruguay: 13-17 Novembe

2006: Kaufman, G.D., Forestell, P.H., Butt, R. and Lehman, S. The Importance of Eden, NSW as an Opportunistic Feeding Area for Southbound East Australian Humpback Whales. DEH Australia: Cetacean Research Priorities Conference, Adelaide, South Australia, Australia: 21-22 February.

2006: Rock, J., Pastene, L.A., Kaufman, G., Forestell, P., Matsuoka, K. and Allen, J. Photographic documentation of East Australia Group V Stock (EAGVS) humpback whale movement between feeding and breeding areas: evidence of a mechanism for interchange between Southern Hemisphere stocks. Journal of Cetacean Research and Management, 8: 301-305.

2006: Forestell, P.H., Kaufman, G.D. and Chaloupka, M. Abundance estimate of humpback whales in Hervey bay, Australia, based on CMR profiles, 1988– 2002. Document SC/A06/HW17 presented to the IWC Intersessional Workshop on Comprehensive Assessment of Southern Hemisphere Humpback Whales, Hobart, Tasmania, Australia: 3-7 April

2006: Kaufman, G., Forestell, P.H., Mallo, A. and Lehmann, S. Calving rates and intervals for east Australia female humpback whales, based on individual photo-identifications: 1984-2005. Document SC/A06/HW23 presented to the IWC Intersessional Workshop on Comprehensive Assessment of Southern Hemisphere Humpback Whales, Hobart, Tasmania, Australia: 3-7 April.

2004: Naessig, P.J. and Lanyon, J.M. Levels and probable origin of predatory scarring on humpback whales (*Megaptera novaeangliae*) in east Australian waters. *Wildlife Research*, 31(2): 163-170.

2001: Forestell, P.H., Paton, D., Hodda, P. and Kaufman, G. Multiple sightings of a hypo-pigmented humpback whale (*Megaptera novaeangliae*) off east coast Australia: 1991- 2000. *Memoirs of the Queensland Museum*, 47: 437-450

2000: Garrigue, C., Forestell, P., Greaves, J., Gill, P., Naessig, P., Patenaude, N. and Baker, C.S. Migratory movement of humpback whales (*Megaptera novaeangliae*) between New Caledonia, East Australia and New Zealand. *Journal of Cetacean Research and Management*, 2(2): 111-115

2000: Forestell, P.H., Paton, D. and Hodda, P. Multiple Sightings of an All-White Humpback Whale Along the East Coast of Australia, 1991- 1999. Proceedings (abstracts) of the Queensland Museum Humpback Whale 2000 Conference, Brisbane, Queensland, Australia: 29 August - 1 September.

2000: Kaufman, G.D., Naessig, P., Forestell, P.H. and Chaloupka, M. Estimates of group size and rates of interchange between humpback whales in the Whitsunday Islands and Hervey Bay, Queensland, Australia. Proceedings (abstracts) of the Queensland Museum Humpback Whale 2000 Conference, Brisbane, Queensland, Australia: 29 August - 1 September.

1999: Chaloupka, M.Y., Osmond, M.G. and Kaufman, G.D. Estimating seasonal abundance trends and survival rates of humpback whales in Hervey Bay (east coast Australia). *Marine Ecology Progress Series*, 184: 291-301

1996: Forestell, P.H. and Kaufman, G.D. Development of Whalewatching in Hawaii and its Application as a Model for Growth and Development of the Industry Elsewhere. *Encounters With Whales 1995 Proceedings*. ANCA, Canberra, Australia: 53-65

1995: Forestell, P.H. and Kaufman, G.D. Development of Whalewatching in Hawaii and its Application as a Model for Growth and Development of the Industry Elsewhere. Encounters With Whales, Hervey Bay, Queensland, Australia: 26-30 July.

1994: Forestell, P.H. and Kaufman, G.D. Field researchers and resource managers: Allies or adversaries? In Postle, D. and Simmons, M. (eds.) Encounters With Whales. Workshop Series No. 20. Great Barrier Reef Marine Park Authority, Townsville, Australia: 17-26

1994: Forestell, P.H. and Kaufman, G.D. Helping Those Who Help Those Who Watch The Whales. Pacific Congress on Marine Science and Technology (PACON 94), Townsville, Queensland, Australia: July.

1993: Kaufman, G.D. and Forestell, P.H. Marine mammals and boats in Hervey Bay Marine Park, Queensland, Australia, as determined by aerial surveys. Proceedings (abstracts) of the 10th Biennial Conference on the Biology of Marine Mammals, Galveston, TX, USA: 11-15 November.

1993: Kaufman, G.D. and Forestell, P.H. The role of research in the development of the whalewatching industry. Invited presentation at Encounters with Whales Conference, Lady Elliot Island, Australia: 7 September.

1993: Forestell, P.H. In the Wake of the Whale: Studying the Migration of Individually Identified Humpback Whales Along the East Coast of Australia. Conference of Marine Education Society of Australasia, Brisbane, Queensland, Australia: 29 September.

1993: Kaufman, G.D., Lagerquist, B.A., Forestell, P.H. and Osmond, M.G. Humpback Whales of Australia: A Catalogue of Individual Whales Identified by Fluke Photographs. Queensland Department of Environment and Heritage, Brisbane, Australia.

1991: Kaufman, G.D., Krutzikowsky, G.K. and Lagerquist, B.A. Reproductive profiles of female humpback whales off east Australia. Proceedings (abstracts) of the 9th Biennial Conference on the Biology of Marine Mammals, Chicago, IL, USA: 5-9 December

1991: Krutzikowsky, G.K., Forestell, P.H., Kaufman, G.D. and Lagerquist, B.A. Migratory timing of east Australian female humpback whales with and without calves. Proceedings (abstracts) of the 9th Biennial Conference on the Biology of Marine Mammals, Chicago, IL, USA: 5-9 December.

1990: Kaufman, G.D., Osmond, M. Forestell, P.H. and Ward, A. Photographic documentation of migratory movement of a humpback whale (*Megaptera novaeangliae*) between east Australia and Antarctic Area V. *Report to the International Whaling Commission (Special Issue 12)*: 265-26

1990: Forestell, P.H., Kaufman, G.D., Lagerquist, B. and Krutzikowsky, G. An examination of bio-geographical factors associated with the presence of humpback whales in Hervey Bay, Australia. Proceedings (abstracts) of the Queensland Museum Humpback Whale Conference, Brisbane, Australia: 27-28 September.

1990: Kaufman, G.D., Osmond, M., Lagerquist, B. and Forestell, P.H. Humpback whales of Australia: A catalogue of individuals identified by fluke and lateral body photographs. Proceedings (abstracts) of the Queensland Museum Humpback Whale Conference, Brisbane, Australia: 27-28 September.

1989: Krutzikowsky, G.K., Forestell, P.H. and Kaufman, G.D. An analysis of humpback whale activity in Hervey Bay, Australia during the southward migration. Proceedings (abstracts) of the 8th Biennial Conference on the Biology of Marine Mammals, Monterey, CA, USA: 7-11 December.

1987: Kaufman, G.D. and Osmond, M. Aspects of population dynamics of east Australian humpback whales. Proceedings (abstracts) of the 7th Biennial Conference on the Biology of Marine Mammals, Miami, FL, USA: 5-9 December.

1987: Kaufman, G.D., Smultea, M. and Forestell P.H. Use of lateral body pigmentation patterns for photo identification of east Australian (Area V) humpback whales. *Cetus*, 7: 5-13

1985: Kaufman, G.D. Photographic fluke and lateral body identification of Australian humpback whales. Proceedings (abstracts) of the 6th Biennial Conference on the Biology of Marine Mammals, Vancouver, B.C., Canada: 22-26 November.

1985: Kaufman, G.D. and Jenkins, P.F. Comparisons of Australian and Hawaiian humpback whale songs. Proceedings (abstracts) of the 6th Biennial Conference on the Biology of Marine Mammals, Vancouver, B.C., Canada: 22-26 November.