

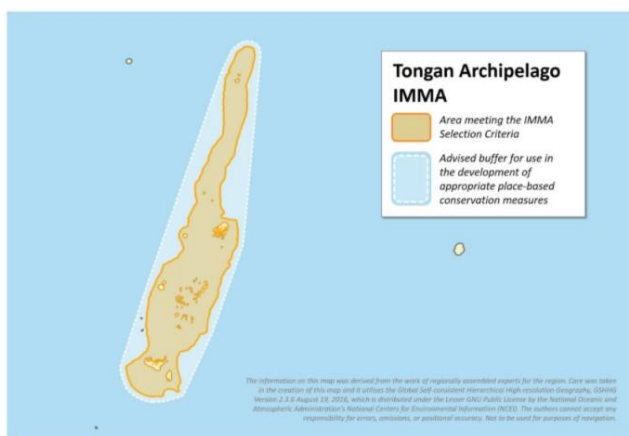
Tongan Archipelago IMMA

Description

The Tongan Archipelago contains 163 largely uninhabited islands, atolls and seamounts spanning approximately 800 km along a north-south line from Niuafu'ou in the north to Eua in the south. There are a diverse array of habitats from deep-sea canyons to steep volcanic islands and reef complexes. The most complex group of islands is the Vava'u group with steep-sided main islands and 55 low-lying coral islands. Research is limited throughout most of the Tongan Archipelago, with efforts primarily focused on humpback whales (Garrigue et al., 2011; Constantine et al., 2012; Kessler and Harcourt, 2012). More recently spinner dolphins were included in a genetic study (Baker, 2015). Increased research effort near Eua Island in recent years has contributed to sightings data on other species (D. Donnelly, unpublished data; South Pacific Whale Research Consortium, unpublished data) that will improve our understanding of the residency patterns, demographic parameters, and connectivity of these species within Tonga and to other island groups throughout the South Pacific (see Baker, 2015 for Oceania-wide research).

Criterion A: Species or Population Vulnerability

The Oceania humpback whale (*Megaptera novaeangliae*) population, of which Tonga forms a sub-population, is assessed as Endangered (EN A1) on the IUCN Red List. The Oceania abundance estimate was 4,329 (CV = 0.12, 3,345-5,313) whales in 2003 (Constantine et al., 2012). Models for the recovery of the Oceania sub-populations suggest this stock likely remain below 30% of pre-exploitation abundance and is recovering at a slower rate than other populations (Jackson et al., 2007). The abundance estimate for the Tongan humpback whales is now over a decade old and, given the absence of direct threats, the population is likely to have increased.



Area Size

50,034 km²

Qualifying Species and Criteria

Humpback Whale – *Megaptera novaeangliae*

Criteria A, B2, C1, D1

Spinner dolphin – *Stenella longirostris*

Criteria B2, C1, D1

Criterion D (2) - Marine Mammal Diversity

Balaenoptera acutorostrata, *Balaenoptera bonaerensis*, *Balaenoptera borealis*, *Balaenoptera edeni*, *Balaenoptera musculus brevicauda*, *Feresa attenuata*, *Globicephala macrorhynchus*, *Grampus griseus*, *Kogia sima*, *Megaptera novaeangliae*, *Orcinus orca*, *Peponocephala electra*, *Physeter macrocephalus*, *Pseudorca crassidens*, *Stenella attenuata*, *Stenella longirostris*, *Steno bredanensis*, *Tursiops truncatus*, *Ziphius cavirostris*

Summary

The Tongan Archipelago spans approximately 800 km, from Niuafu'ou in the north to Eua in the south. Research has focused on the main island groups with concentrated efforts on humpback whales (*Megaptera novaeangliae*) in the coastal waters that form their winter breeding grounds from August to November. The differentiation of mtDNA haplotypes, in comparison to other breeding grounds, confirms the long-term natal site fidelity of humpback whales to the Tongan breeding grounds. Spinner dolphins (*Stenella longirostris*) are sighted year-round in Vava'u but no other delphinids are known to be resident despite sightings of nine additional species.

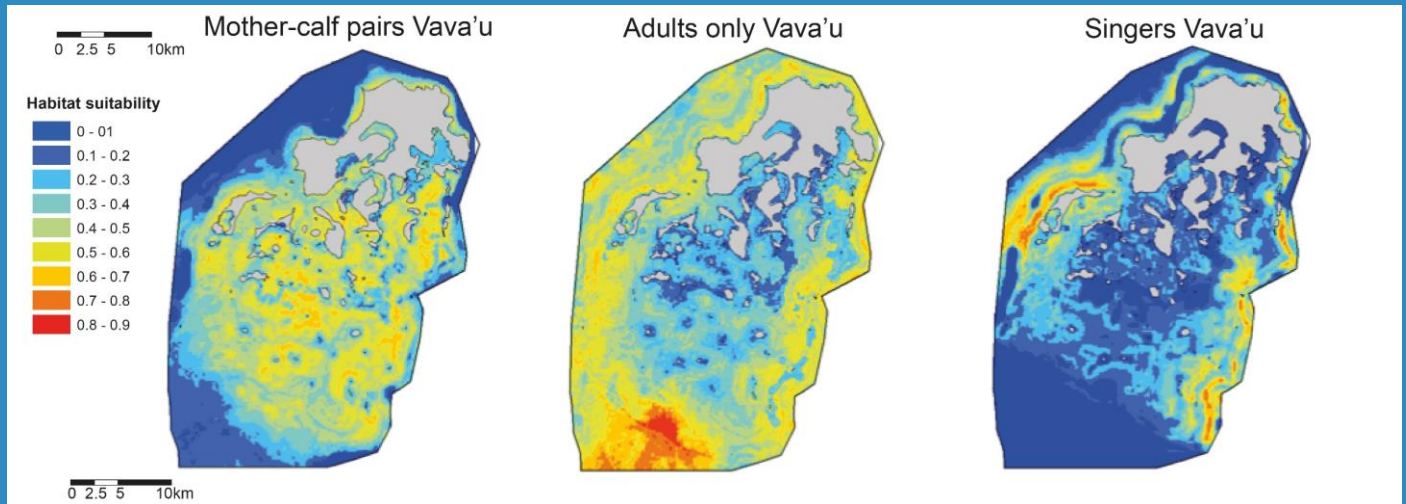


Figure 1: Predicted habitat-suitability surfaces for mother-calf pairs, adults only, and singers off Vava'u. Yellow and red indicate areas predicted by the MaxEnt models to provide suitable habitat for humpback whales. From: Lindsay et al., 2016.

Criterion B: Distribution and Abundance

Sub-criterion B2: Aggregations

The nearshore waters of all island groups in the Tongan Archipelago are critical habitat where humpback whales aggregate for breeding during the winter months. In Vava'u this habitat is important for all sex- and age-class groups of whales (Lindsay et al., 2016). Similar aggregations of whales occur in the Ha'apai group (Kessler & Harcourt 2012) and in Eua (Constantine et al., 2014).

There is an aggregation of spinner dolphins that has been sighted over multiple years in the white cliffs area of Vava'u. There is little information to infer the residency pattern of individuals within and between years, but the consistency with which spinner dolphins are observed in the region suggests its importance to the species. Spinner dolphins have been reported at Tongatapu (D. Donnelly, unpublished data) and it is possible that further populations of this species exist in other areas throughout the Tongan Archipelago. Sightings data are from reliable sources, but effort is lacking.

Criterion C: Key Life Cycle Activities

Sub-criterion C1: Reproductive Areas

The Tongan islands form critical annual winter calving and mating habitat for humpback whales Fig. 1 and 2) (Constantine et al., 2012; Lindsay et al., 2016). *Stenella longirostris* calves have been observed in Vava'u which is expected for a resident population of dolphin

(South Pacific Whale Research Consortium, unpublished data). There are no data on the calving rates, or any other demographic information, for the spinner dolphins in Vava'u.



Figure 2: Humpback whales fluking off the Tongan Archipelago. Photo courtesy of the Tongan Whale Research Project, University of Auckland.

Criterion D: Special Attributes

Sub-criterion D1: Distinctiveness

There have been documented movements of individual humpback whales between island groups and with other breeding grounds throughout Oceania (Garrigue et al., 2002; 2011; Steel et al., 2011). Overall, there is strong natal site fidelity with mitochondrial DNA haplotypes distinctive to Tongan whales (Olavarria et al., 2007). Available genetic samples of spinner dolphins from Vava'u show significant differentiation from other South Pacific Island populations, but the sample size is small (Baker, 2015). Further samples from Vava'u and other regions in the Tongan Archipelago would be useful to confirm distinctiveness.

Criterion D: Special Attributes

Sub-criterion D2: Diversity

In addition to humpback whales and spinner dolphins, there are a number of additional species reported in the Tongan Archipelago IMMA. There are seven other species of whale reported to date; pygmy blue, sperm, dwarf and Antarctic minke, dwarf sperm, sei and Bryde's-like whales and one report of a stranded Cuvier's beaked whale. In addition, there are nine other species of delphinids; short-finned pilot, false killer, pygmy killer, melon-headed and killer whales, pan-tropical spotted, rough-toothed, common bottlenose and Risso's dolphins (Miller 2009, SPREP 2014, South Pacific Whale Research Consortium and D. Donnelly, unpublished data).

Supporting Information

Baker, C.S. 2015. A pattern of dolphin (aPOD) – the seascape genetics of island populations in protected and unprotected habitats of Oceania. Final Report to Pew Foundation.

Balcazar, N.E., Tripovich, J.S., Klinck, H., Nieukirk, S.L., Mellinger, D.K., Dziak, R.P., Rogers, T.L. 2015. Calls reveal population structure of blue whales across the southeast Indian Ocean and the southwest Pacific Ocean. *Journal of Mammalogy* 96: 1184-1193. <https://doi.org/10.1093/jmammal/gyv126>

Constantine, R., Jackson, J.A., Steel, D., Baker, C.S., Brooks, L., Burns, D., Clapham, P., et al. 2012. Abundance of humpback whales in Oceania using photo-identification and microsatellite genotyping. *Marine Ecology Progress Series* 453: 249–261. doi: 10.3354/meps09613

Garrigue, C., Aguayo, A., Amante-Helweg, V.L.U., Baker, C.S. 2002. Movements of humpback whales in Oceania, South Pacific. *Fisheries Science* 4: 255–260.

Garrigue, C., Constantine, R., Poole, M., Hauser, N. 2011. Movement of individual humpback whales between wintering grounds of Oceania (South Pacific), 1999 to 2004. *Journal of Cetacean Research and Management* 3: 275–281.

Garrigue, C., Clapham, P.J., Geyer, Y., Kennedy, A.S., Zerbini, A.N. 2015. Satellite tracking reveals novel migratory patterns and the importance of seamounts for endangered South Pacific humpback whales. *Royal Society Open Science* 2: 150489

Jackson, J.A., Zerbini, A., Clapham, P., Constantine, R., Garrigue, C., Hauser, N., Poole, M.M., Baker, C.S. 2013. Population modelling of humpback whales in East Australia (BSE1) and Oceania (BSE2, BSE3, BSF2). Report SC/65A/SH07 to the Scientific Committee of the International Whaling Commission.

Kessler, M., Harcourt, R. 2012. Management implications for the changing interactions between people and whales in Ha'apai, Tonga. *Marine Policy* 36: 440-445. <http://dx.doi.org/10.1016/j.marpol.2011.08.004>

Lindsay, R.E., Constantine, R., Robbins, J., Mattila, D.K., Tagarino, A., Dennis, T.E. 2016. Characterising essential breeding habitat for whales informs the development of large-scale Marine Protected Areas in the South Pacific. *Marine Ecology Progress Series* 548: 263-275. doi: 10.3354/meps11663

Miller, C. 2009. Current state of knowledge of cetacean threats, diversity and habitats in the Pacific Islands region, 2009 Revision. Report to the Convention of Migratory Species. Whale and Dolphin Conservation Society, July 2009.

Olavarria, C., Baker, C.S., Garrigue, C., Poole, M., Hauser, N., Caballero, S., Flórez-González, L., et al. 2007. Population structure of humpback whales throughout the South Pacific and the origins of the eastern Polynesian breeding grounds. *Marine Ecology Progress Series* 330:257-268. doi: 10.3354/meps330257

SPREP. 2014. Rapid biodiversity assessment (BIORAP) Vava'u Group – Kingdom of Tonga. Final Report, South Pacific Regional Environment Programme, February 2014.

Steel, D., Anderson, M., Garrigue, C., Olavarria, C., Caballero, S., Childerhouse, S., Clapham, P., et al. 2018. Migratory interchange of humpback whales (*Megaptera novaeangliae*) among breeding grounds of Oceania and connections to Antarctic feeding areas based on genotype matching. *Polar Biology* 41, 653–662.

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