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The title of the article was changed by the Editor without consultation. The title of the submitted article was:

False killer whales in Hawaiian waters: bycatch in the long-line fishery and the long-line exclusion zone around the main Hawaiian Islands


Left: young male platypus and right: dead platypus in an opera house trap. Both images © The Australian Platypus Conservancy (APC).

Water rat numbers are thought to have crashed in Cooper Creek in far western Queensland and places such as Innaminka, not far over the border in South Australia, because of Queenslanders using Opera House traps. Mr Boyland said he hoped a workable alternative could be found that would save bycatch from drowning.

It might be that a reduction in the trap entrance size from 10cm to 6cm would stop platypus and turtles from being killed, but whether water rats could enter through an opening of that size is yet to be clarified. "I*t's a simple thing to do, reduce the diameter of the trap's ring and we hope the Government will move quickly on it, if it resolves the problem,*" Mr Boyland said.

"*Traps are commonly set in the summer, which is also the breeding season of the platypuses." If a breeding female is trapped in a yabby trap, any dependent young waiting in the nursery burrow for her return will slowly starve to death.*"

It is not clear exactly how many are being killed, but there is ample anecdotal evidence that they are having an impact. University of NSW platypus biologist Tom Grant said the traps were deadly and should not be used.

For more information Contact Des Boyland at: desboyland@wildlife.org.au or Dr Tom Grant at: t.grant@unsw.edu.au.

False Killer Whale Bycatch in the Longline Exclusion Zone of the Main Hawaiian Islands

Robin W. Baird, Cascadia Research Collective, Olympia, Washington, USA

The Hawai'i-based longline fishery includes two components, a deep-set component targeting tuna (primarily bigeye tuna but also yellowfin tuna), and a shallow-set component targeting swordfish. In recent years due to bycatch of turtles, the shallow-set fishery has had 100% observer coverage, while the deep-set fishery has had approximately 20% observer coverage. Marine mammal bycatch information recorded through the observer program has indicated that one species, the false killer whale, is caught at rates that have exceeded the Potential Biological Removal (PBR) level at least since 2000, when the first bycatch information and false killer whale estimates became available (Forney *et al.,* 2000, Forney and Kobayashi, 2007). The majority of the false killer whale bycatch is in the deep-set fishery, although some individuals have been recorded caught in the shallow-set fishery (the most recent in 2008).

Largely as a result of this high bycatch rate, efforts have been made to assess population size and population structure of false killer whales in Hawaiian waters in recent years. The first available population estimate was based on aerial surveys undertaken around the main Hawaiian Islands in the 1990s by Mobley *et al.* (2000), indicating that the population was very small (estimated at 121 individuals). A large-vessel survey of the entire Hawaiian Exclusive Economic Zone in 2002 resulted in an estimate of 236 individuals (Barlow, 2006), but for a much larger area (a re-analysis of this data set later resulted in an estimate of 484 individuals for the same area; Barlow and Rankin, 2007). Starting in 2000, photo-identification data and genetic analyses of biopsy samples collected both around the main Hawaiian Islands and elsewhere in the tropical Pacific began to provide evidence that there were in fact two populations within Hawaiian waters, an island-associated population around the main Hawaiian Islands, and an offshore population (Chivers *et al.,* 2007; Baird *et al.,* 2008a). This island-associated population is the only genetically isolated population of false killer whales to be identified.

The National Marine Fisheries Service (NMFS) officially divided false killer whales in Hawaiian waters into two stocks this year (Carretta *et al.,* 2009), and the estimate of 484 individuals arising from the 2002 survey (Barlow and Rankin, 2007) was considered the best estimate for the "pelagic" stock within Hawaiian waters. For the island-associated population, the best estimate is based on a photographic mark-recapture analysis from 2000 - 2004, with just 126 individuals estimated for the population (Baird *et al.,* 2005).

Even with the larger population estimate for the pelagic stock, bycatch in the longline fishery continues to exceed the PBR for that stock (Carretta *et al.,* 2009). Since 1992, longline fishing has been excluded around the main Hawaiian Islands to reduce conflicts with both commercial and recreational fisheries undertaken closer to shore. The longline exclusion zone boundary varies seasonally: for four months of the year, from October 1st through January 31st, more than half the boundary moves closer to the islands (Figure 1).

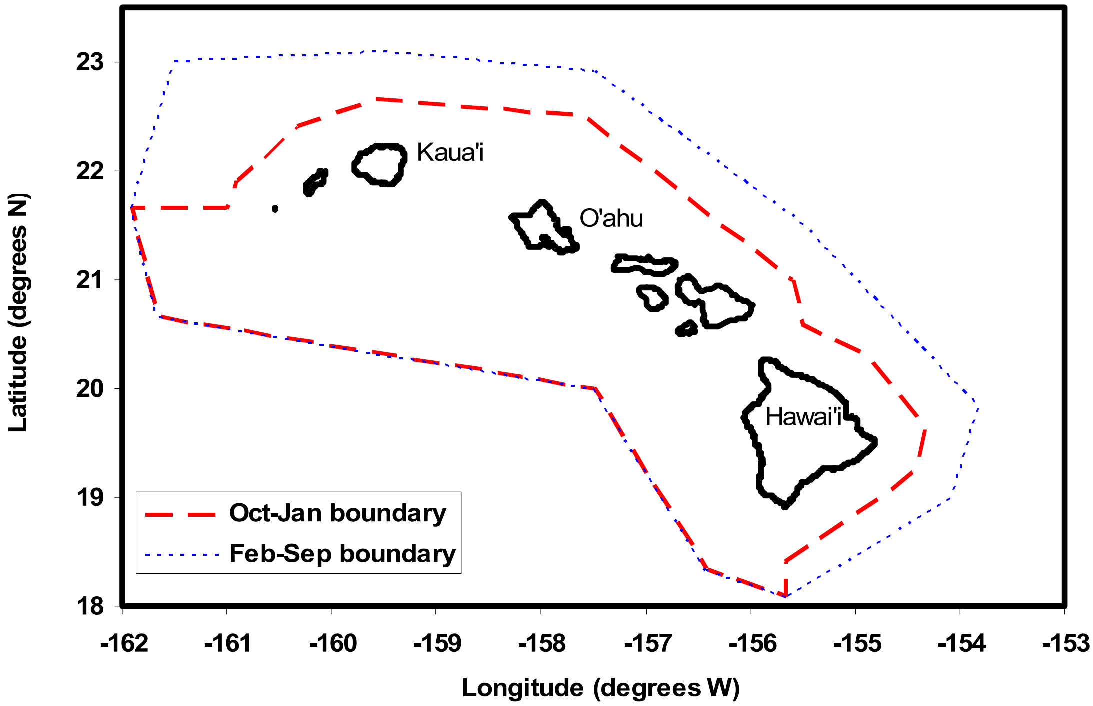

Figure 1. The longline exclusion boundary around the main Hawaiian Islands. The October 1st through January 31st boundary is shown in a red heavy dashed line, while the February 1st through September 30th boundary is shown with a blue dotted line.

The longline fishery exclusion zone has been characterized as a 25-75 nautical mile exclusion zone, although in fact, it much more complicated. As the boundaries were set initially as a series of points around the islands, with the varied contours of the islands they cannot be easily characterized by distance. A GIS analysis of the distance from the exclusion boundary to the closest point of land was undertaken at 5km intervals along the boundary. From February through September, the closest that longline fishing is allowed to the main Hawaiian Islands is 78.6km (42.4nm), while from October through January, the closest the boundary comes to the islands is 45.1km (24.3nm). From October through January, over 25% of the boundary lies between 45 and 50km from shore, but some of the boundary approaches no closer than 194 km (104nm), while in February through September the boundary distance is more diffuse, with less than 7% of the boundary between 75 and 85km from shore (Figure 2).

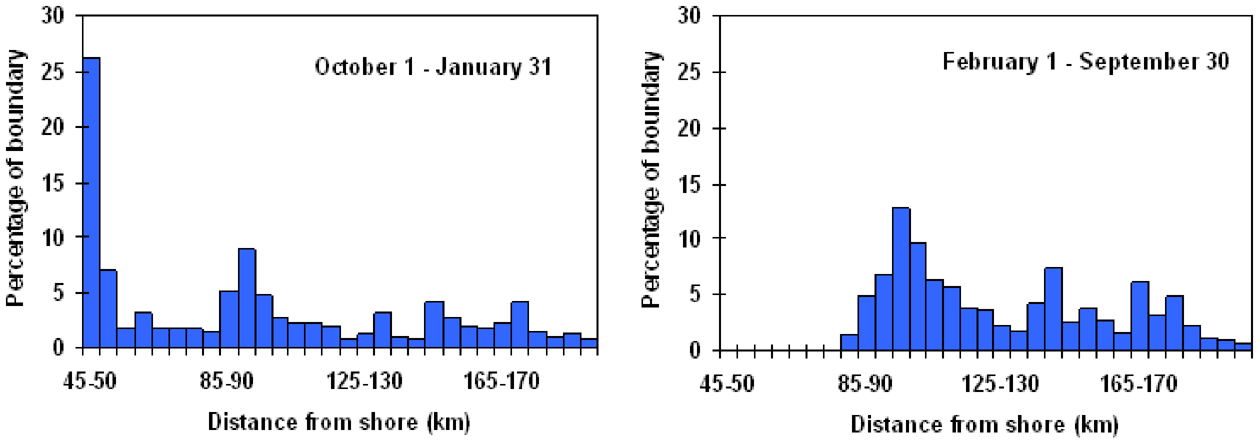

Figure 2. The distance from shore of the longline exclusion boundary for October through January (left) and February through September (right).

Why is this important? Now that the existence of a small, demographically-isolated island-associated population of false killer whales in Hawaiian waters has been officially recognized (Carretta *et al.* 2009), the question is whether the documented bycatch of false killer whales in the longline fishery comes only from the offshore population, or also potentially from the island-associated population. There is evidence the island-associated population has declined dramatically over the last 20 years, including a significant decline in sighting rates in aerial surveys undertaken by Joe Mobley and colleagues (J. Mobley, unpublished data), as well as differences in group sizes and sighting rates from a survey in 1989 compared to more recent years (Reeves *et al.* 2009). However, the causes of this decline are unclear.

In recent years, satellite tags have been deployed on false killer whales in Hawaiian waters to examine movements (Baird *et al.* 2008b). One offshore false killer whale was satellite tagged 126km west of the island of Hawai‘i and did cross inshore of the longline fishery boundary (Baird *et al.* 2008b). Satellite tags have been deployed on individuals from three different groups from the insular population (11 tags total); although none of those crossed the longline exclusion boundary, all three groups did move further than 80km offshore (maximum 96km; Baird *et al.* 2008b), suggesting they likely move into areas where longline fishing occurs, if only seasonally. Gaining more information on false killer whale movements will be a slow process: in studies around the main Hawaiian Islands since 2000, with 52,000km of survey effort, false killer whales have been encountered only 27 times, an average of one sighting every 17.6 days of search effort. Given the logistics of finding false killer whales and being able to approach closely enough for satellite tagging in variable sea conditions, it will be much easier to deploy additional satellite tags on individuals from the insular population than the offshore population.

Although it will require a substantial investment of funds and time, it should be possible to characterise how much time island-associated false killer whales spend offshore in areas where longline fishing occurs. However, assessing how much time offshore animals spend in areas

False killer whale with dorsal fin disfigurement © D. L. Webster

that overlap with insular animals will be much more difficult. Observers on board longline vessels have been able to collect biopsy samples from some hooked individuals >200km from the islands, and so they do not provide any relevant information as to whether individuals from the insular population interact with the fishery.

There is evidence that individuals from the insular population interact with fisheries, including individuals that have been documented with major dorsal fin disfigurements associated with line injuries (Baird and Gorgone, 2005). Whether these injuries are from short-line gear (longlines that are <1nm in length) that occur near shore or longlines offshore is unknown. Given the small population size and the evidence of a population decline (Reeves *et al.,* 2009), identifying the sources of such injuries will be critical to conserving the small isolated island-associated population.

For more information contact Robin Baird at: rwbaird@cascadiaresearch.org.

References

Baird, R.W., and A.M. Gorgone. 2005. False killer whale dorsal fin disfigurements as a possible indicator of longline fishery interactions in Hawaiian waters. Pacific Science 59:593-601.

Baird, R.W., A.M. Gorgone, D.L. Webster, D.J. McSweeney, J.W. Durban, A.D. Ligon, D.R. Salden, and M.H. Deakos. 2005. False killer whales around the main Hawaiian islands: an assessment of inter-island movements and population size using individual photo-identification. Report prepared under Order No. JJ133F04SE0120 from the Pacific Islands Fisheries Science Center, National Marine Fisheries Service. Available from: www.cascadiaresearch.org/robin/hawaii.htm.

Baird, R. W., A. M. Gorgone, D. J. McSweeney, D. L. Webster, D. R. Salden, M. H. Deakos, A. D. Ligon, G. S. Schorr, J. Barlow, and S. D. Mahaffy. 2008a. False killer whales (*Pseudorca crassidens*) around the main Hawaiian Islands: long-term site fidelity, inter-island movements, and association patterns. Marine Mammal Science 24:591-612.

Baird, R.W., G.S. Schorr, D.L. Webster, D.J. McSweeney, M.B. Hanson, and R.D. Andrews. 2008b. Movements of satellite-tagged false killer whales around the main Hawaiian Islands. Document PSRG-2008-13 submitted to the Pacific Scientific Review Group, Kihei, HI, November 2008.

Barlow, J. 2006. Cetacean abundance in Hawaiian waters estimated from a summer/fall survey in 2002. Marine Mammal Science 22:446-464.

Barlow, J., and S. Rankin. 2007. False killer whale abundance and density: preliminary estimates for the PICEAS study area south of Hawaii and new estimates for the US EEZ around Hawaii. Southwest Fisheries Science Center Administrative Report LJ-07-02.

Carretta, J.V., K.A. Forney, M.S. Lowry, J. Barlow, J. Baker, D. Johnston, B. Hanson, M.M. Muto, D. Lynch and L. Carswell. 2009. U.S. Pacific marine mammal stock assessments: 2008. NOAA Technical Memorandum NMFS NOAA-TM-NMFS-SWFSC-434.

Chivers, S. J., R. W. Baird, D. J. Mcsweeney, D. L. Webster, N. M. Hedrick and J. C. Salinas. 2007. Genetic variation and evidence for population structure in eastern North Pacific false killer whales (*Pseudorca crassidens*). Canadian Journal of Zoology 85:783-794.

Forney, K.A., J. Barlow, M.M. Muto, M. Lowry, J. Baker, G. Cameron, J. Mobley, C. Stinchcomb, and J.V. Carretta. 2000. U.S. Pacific marine mammal stock assessments: 2000. NOAA Technical Memorandum NOAA-TM-NMFS-SWFSC-300. 246p.

Forney, K. A. and D. Kobayashi. 2007. Updated estimates of mortality and injury of cetaceans in the Hawaii-based longline fishery, 1994-2005. NOAA Technical Memorandum NMFS-SWFSC-412.

Mobley, J. R., S. S. Spitz, K. A. Forney, R. A. Grotefendt, and P. H. Forestell. 2000. Distribution and abundance of odontocete species in Hawaiian waters: preliminary results of 1993-98 aerial surveys. National Marine Fisheries Service Southwest Fisheries Science Center Admin. Rep. LJ-00-14C.

Reeves, R.R., S. Leatherwood and R.W. Baird. 2009. Evidence of a possible decline since 1989 in false killer whales (*Pseudorca crassidens*) around the main Hawaiian Islands. Pacific Science 63:253-261.

BirdLife Global Seabird Programme Launches Seabird Bycatch Mitigation Fact Sheets

Elizabeth Reid, Birdlife International, Australia

In recent years, there has been significant progress made with the development of mitigation measures to reduce seabird bycatch in longline and trawl fisheries. But there has been no 'one-stop shop' to review descriptions, technical details and best practice operational guidelines for these measures.

Over the last 12 months, the BirdLife Global Seabird Programme has been working closely with world leaders in seabird bycatch mitigation to develop a series of 14 seabird bycatch mitigation fact sheets. The series provides the latest best practice advice to fishermen and policy makers about how they can most effectively reduce seabird mortality in pelagic and demersal longline and trawl fisheries. Each mitigation measure is assessed based on current scientific knowledge, including findings of the latest at-sea experimental research. Each fact sheet addresses a specific mitigation measure and makes recommendations about the most effective combination of measures.

The following table gives a list of the fact sheets that are currently available. The series of fact sheets has been designed to influence the uptake of best practice mitigation in coastal state and high seas fisheries. We have worked closely with the Agreement on the Conservation of Albatross and Petrels (ACAP) to assist in maintaining a dynamic and up-to-date resource that captures new findings derived from mitigation research and operational implementation. One of the first applications of the fact sheets will be their submission to upcoming regional fisheries management organisation meetings.