2010 Annual Report

Seabird Interactions and Mitigation Efforts in the Hawaii Longline Fisheries

NOAA FISHERIES SERVICE

Pacific Islands Regional Office
Sustainable Fisheries Division

September 2011

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Cover photos (from top to bottom):

Juvenile bigeye tuna (D. Itano)
Laysan, black-footed and short-tailed albatrosses on Midway Atoll (E. Gilman)
Longline vessels at Pier 38 in Honolulu (E. Brown)

PREFACE

Dr. Marti McCracken of the National Marine Fisheries Service (NMFS) Pacific Islands Fisheries Science Center (PIFSC) provided the 2010 interaction estimates for protected species caught incidentally in the Hawaii deep-set longline fishery. M. Kimberly Lowe, PIFSC, provided plots of fishing effort distribution. Lesley Jantz, NMFS Pacific Islands Regional Office (PIRO) Observer Program and Haiying Wang, PIFSC, provided spatial distribution interaction and sighting plots. Eric Forney, Daniel Luers, and Jeremy Willson, PIRO Observer Program provided observer program data and seabird interaction information for the report.

This annual report was prepared by Eric Gilman, Hawaii Pacific University, and Brett Wiedoff, NMFS PIRO.

Annual Report on Seabird Interactions and Mitigation Efforts in the Hawaii Longline Fisheries – 2010

Sustainable Fisheries Division
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September 2011

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1. INTRODUCTION

Fish, such as mackerel, are important prey for ocean-going seabirds, and are the primary bait used in longline fishing to catch valuable pelagic fish, sometimes resulting in interactions between fishing operations and seabirds. In the Hawaii-based pelagic longline fisheries that target tunas and swordfish, fishing gear may hook or entangle birds that attempt to take bait from the longline gear while it is being deployed or retrieved. Seabirds likely drown if the interaction occurs during gear deployment (setting), but during gear retrieval (hauling) seabirds may be only injured and released alive when fishermen promptly apply best practice seabird handling and release techniques. Fishermen want to catch fish, not seabirds, and although interactions are unavoidable, they can be minimized so that seabird populations remain healthy and fishermen can pursue their livelihood.

The Hawaii longline fisheries have progressed greatly in the last decade in minimizing interactions with seabirds, particularly with Laysan and black-footed albatrosses, the birds that interact most with the fisheries. Consider that in 2000, the National Marine Fisheries Service (NMFS) estimated the number of interactions at about 2,400, and in 2010 the number was about 300 (seabird population estimates are provided in Section 1.1 for comparison). This reduction in interactions is due to seabird management measures developed by the Western Pacific Fishery Management Council (WPFMC) and implemented by NMFS. Credit is mostly due to the fishermen, themselves, who comply with seabird bycatch mitigation requirements, which include mandatory training in seabird identification, fishing techniques to avoid seabirds, and special care and release of incidentally-caught seabirds.

Monitoring of seabird-longline interactions and periodic reporting of such occurrences are integral to determining the effectiveness of the seabird mitigation effort. NMFS compiles information on seabird interactions in the Hawaii longline fisheries and prepares an annual report for fishermen, the fishing industry, government agencies, non-government organizations, and the interested public. This report summarizes seabird interactions in Hawaii pelagic longline fisheries in 2010. In the 2010 deep-set fishery, based on 22.2% observer coverage and 57 observed seabird interactions, NMFS estimated that fleet-wide, 220 seabird interactions occurred. In the 2010 shallow-set fishery, with 100% observer coverage, observers recorded interactions with 79 seabirds.

Three endangered seabird species have ranges that overlap with the areas where Hawaii longline fisheries operate: short-tailed albatross[1], Newell's shearwater, and Hawaiian dark-rumped petrel. On shallow-set trips, observers sighted two short-tailed albatross, with no interactions, and did not record any sightings of, or interactions with, Newell's shearwater or Hawaiian dark-rumped petrel. Observers on deep-set trips did not record sightings of, or interactions with, any seabirds listed under the Endangered Species Act (ESA). Historical seabird interaction information is described in the 2009 Annual Report - Seabird Interactions and Mitigation Efforts in the Hawaii Longline Fisheries (NMFS 2010).

[1] In 2010, a breeding pair of short-tailed albatross at Midway Atoll hatched a chick that fledged and left the nest.

In addition to operational requirements to avoid seabird interactions, owners and operators of pelagic longline vessels must annually complete a Protected Species Workshop. In 2010, NMFS trained over 300 vessel owners, captains, and crew in American Samoa and Hawaii to review regulations, identify protected species, including seabirds, and safely handle and release any protected resources fishermen might hook or entangle.

Hawaii pelagic longline fisheries are managed under the Fishery Ecosystem Plan for Pelagic Fisheries of the Western Pacific Region (Pelagics FEP), developed by the WPFMC and implemented by NMFS. Since 1994 the Hawaii longline fleet has been limited to 164 vessels, and about 120-130 vessels are active in any given year. The deep-set fishery primarily targets bigeye tuna, while the shallow-set fishery primarily targets broadbill swordfish using different fishing methods and gear. The fisheries operate longline gear from 35 to 400 meters in depth. The deep-set fishery traditionally operates between 140° and 180° W longitude and from 0° to 35° N latitude with the majority of fishing taking place to the northeast and southwest of, the Main Hawaiian Islands (Fig. 1). The shallow-set fishery typically operates between 140° and 180° W longitude and 20° and 40° N latitude, with the majority of longline fishing effort concentrated between 25° and 35° N latitude (Fig. 2). For a detailed description of the Hawaii longline fisheries, please see the Pelagics FEP (WPFMC 2009).

1.1. Seabird Species

NMFS observers report any hooking or entanglement of seabirds by longline fishing gear. The following species have been observed hooked or entangled in the fisheries since 1994, when observers began recording interactions: Laysan (*Phoebastria immutabilis*) and black-footed albatrosses (*P. nigripes*), sooty shearwater, (*Puffinus griseus*), other shearwaters not identified to the species level, brown boobies (*Sula leucogaster*), red-footed boobies (*S. sula*), and Northern fulmar (*Fulmarus glacialis*). None of these species is listed under the Endangered Species Act. The Laysan albatross population is estimated at about 1.2 million adults. Midway and Laysan Islands in the Northwestern Hawaiian Islands (NWHI) have the world's largest colonies, and together support more than 90% of the global breeding population (ACAP 2009). The global breeding population of black-footed albatross is estimated to be 122,614, with 95% breeding in the NWHI (USFWS unpublished data in Naughton et al., 2008). The estimated worldwide population of Northern Fulmars is 10-12 million individuals, and the North American breeding population is estimated at 2.1 million individuals. The red-footed booby winters on tropical islands in most oceans, ands its total population is estimated at 1,000,000 birds (Birdlife 2011a). The brown booby is found throughout the pan-tropical oceans, with a population is estimated at 200,000 adults (Birdlife 2011b). The total world population of sooty shearwaters is estimated at more than 20 million mature individuals. These birds nest only in Australia, New Zealand, and southern South America (Birdlife 2011c).

1.2. Seabird Mitigation Measures for the Hawaii Longline Fisheries

Regulations for the Hawaii longline fisheries are in Title 50 of the Code of Federal Regulations Part 600, and Part 665. NMFS provides fishermen with an updated regulation summary for the Hawaii longline fishery. The current suite of seabird mitigation measures required for the Hawaii longline deep- and shallow-set fisheries, summarized in Table 1, went into effect on January 18, 2006. Vessels can select to employ one of two optional suites of seabird deterrent measures, during either stern- or side-set fishing.

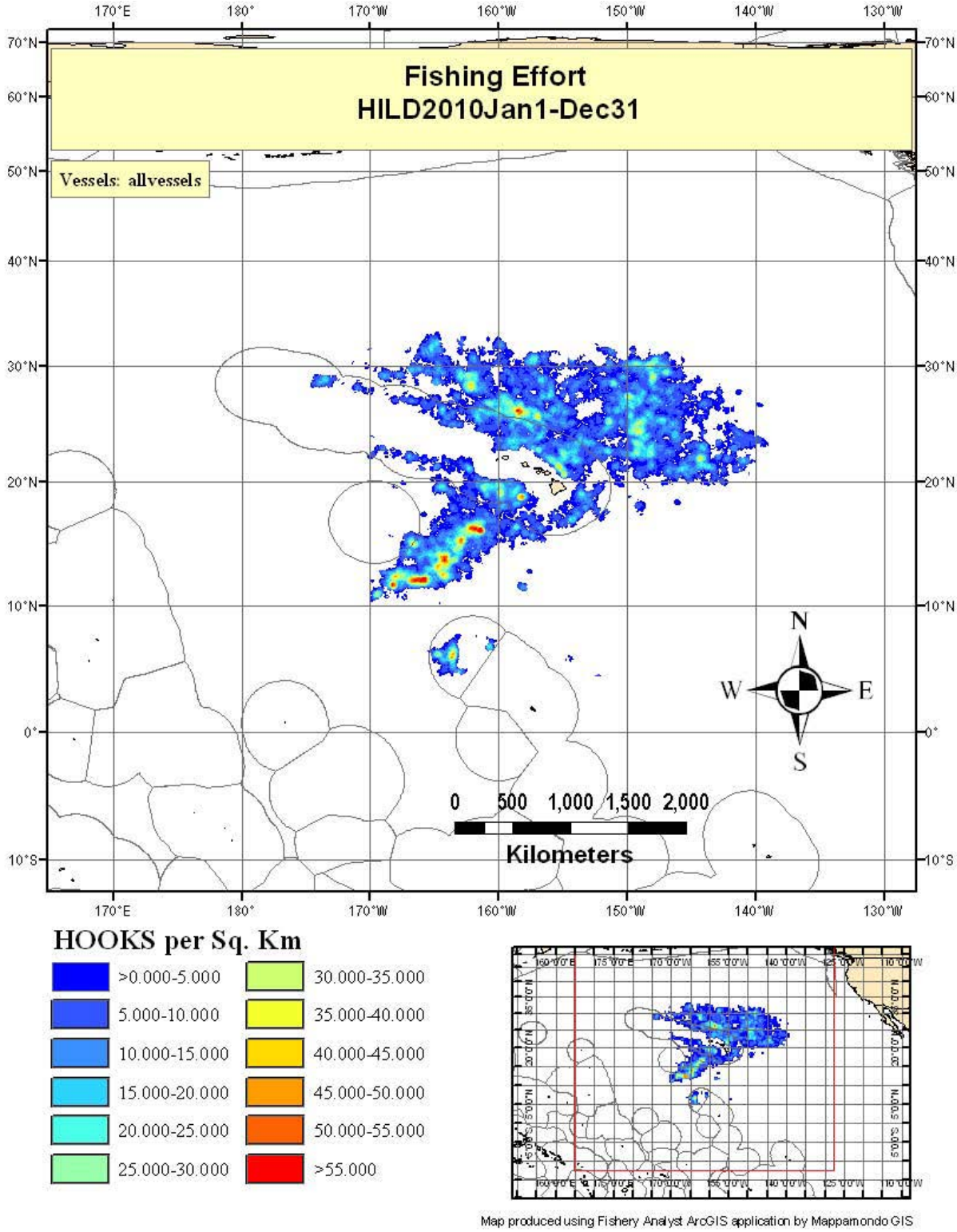

Figure 1. Spatial distribution of fishing effort by the Hawaii longline deep-set fishery, 2010.
Source: NMFS PIFSC, unpublished.

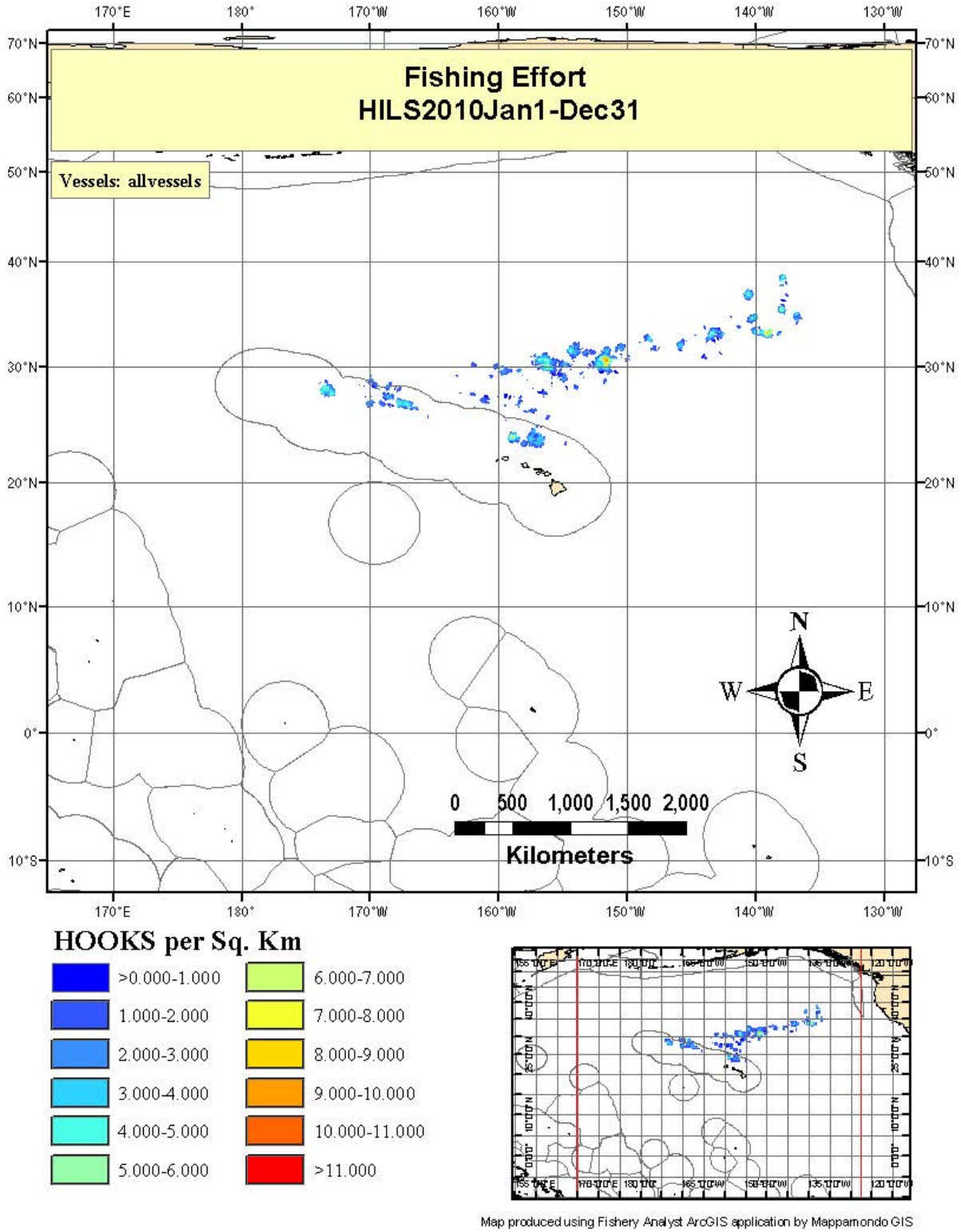

Figure 2. Spatial distribution of fishing effort by the Hawaii longline shallow-set fishery, 2010.
Source: NMFS PIFSC, unpublished.

Table 1. Seabird bycatch mitigation methods required for the Hawaii longline fleet.

1. How do you set your gear →	STERN-SETTING		SIDE-SETTING	
2. Do you shallow-set or deep-set, and where are you →	Shallow-Set Anywhere	Deep-Set North of 23^0 N	Shallow-Set Anywhere	Deep-Set North of 23^0 N
3. What you need to do ↓				
Deploy mainline from port or starboard side at least 1 m forward of stern corner			Yes	Yes
If line shooter is used, mount it at least 1 m forward from stern corner			Yes	Yes
Use a specified bird curtain aft of the setting station during the set			Yes	Yes
Deploy gear so that hooks do not resurface			Yes	Yes
Attach 45 g or heavier weights within 1 m of hook of each hook		Yes	Yes	Yes
Use a line shooter to set the mainline		Yes		
Keep two 1-pound containers of blue-dye on boat	Yes	Yes		
Use completely thawed and blue-dyed bait	Yes	Yes		
Keep fish parts and spent bait with all hooks removed for strategic offal discard	Yes	Yes		
Cut all swordfish heads in half, and use heads and livers for strategic offal discard	Yes	Yes		
Night Set - begin set 1 hour after local sunset and finish 1 hour before next sunrise and keep lighting to a minimum	Yes			

Table 2. Number of active and observed Hawaii longline vessels side- and stern-setting, 2010.

Fishery and set position	Vessels
Deep-set stern setting	83
Deep-set side setting	30
Shallow-set stern setting	28
Shallow-set side setting	2

1.3. Number of Vessels Side-setting and Stern-setting

Table 2 summarizes the number of active Hawaii pelagic longline deep- and shallow-set vessels in 2010 that set from the stern and from the side that also carried a NMFS observer one or more times during the year. There is some overlap of vessels reported in each fishery because some vessels operate in both fisheries during the year.

1.4. Fishing Effort and Observer Coverage

In 2010, 122 Hawaii longline vessels made 16,070 deep sets during 1,205 trips, setting a total of 37,197,582 hooks. In addition, 28 vessels made 1,833 shallow sets in 108 trips, setting a total of 1,803,432 hooks. NMFS placed observers on 22.2% of deep-set fishing trips, observing 3,580 of 16,070 sets, and 100% coverage of shallow set trips (observing all 1,833 sets). Roughly half of the observed deep sets (1,745) were north of 23° N. latitude, the latitude north of which deep-set vessels must employ seabird bycatch mitigation measures. NMFS provides summary reports from mandatory logbook data reported by longline captains.

2. SEABIRD INTERACTIONS

2.1. Location, level and nominal rates of observed seabird interactions

In 2010, the deep-set fishery interacted with one sooty shearwater, 39 Laysan albatrosses, and 17 black-footed albatrosses. The shallow-set fishery interacted with one northern fulmar, 40 Laysan albatrosses, and 38 black-footed albatrosses. Table 3 summarizes 2010 seabird interactions, based on the date of the beginning of the haul, including the condition of seabirds upon release. There was 100% observer coverage of shallow-set fishery, therefore; the number of interactions shown in Table 3 represents the fleet-wide total for 2010. Table 3 contains the number of observed interactions for the deep-set fishery, and not a fleet-wide extrapolation (see Table 4).

Figures 3 and 4 show the spatial distribution of observed seabird interactions in Hawaii longline deep- and shallow-sets, respectively, based on observations of seabirds retrieved during gear hauling in 2010.

Table 3. Observed seabird catch levels and nominal rates in the Hawaii longline fisheries, 2010.

	Laysan albatrosses	Black-footed albatrosses	Shearwater species	Northern Fulmars	Total no. birds observed caught	No. birds released alive	No. birds released dead	Total observed effort (no. of hooks)	Nominal seabird catch rate (no. birds per 1,000 hooks)
Deep sets	39	17	1	0	57	1	56	8,161,800	0.007
Shallow sets	40	38	0	1	79	61	18	1,832,471	0.040

Source: NMFS Observer Program, unpublished.

2.2. Nominal and extrapolated interactions for the deep-set longline fishery

Table 4 reports an estimated fleet-wide extrapolation of seabird interaction levels during deep-set trips completed in 2010. The nominal seabird interaction rate (interactions per 1,000 hooks) reported in Table 4 is the annual total point estimate for seabird interactions divided by the total number of hooks deployed in the fishery (37,197,582). Some seabirds caught in longline gear may drop off the gear before gear retrieval due to scavenging, currents, or other mechanical action during the line soak and haul. Estimates of seabird drop-off rates for the Hawaii longline deep- and shallow-set fisheries have been estimated to be 34% and 28%, respectively (Gilman et al., 2003; Gilman et al., 2007). The seabird catch levels and rates reported in Table 4 do not include estimates for these unobserved seabird drop-offs.

Table 4. Fleet-wide estimates of the number of black-footed and Laysan albatross incidental interactions and corresponding 95% confidence intervals for the Hawaii deep-set longline fishery, 2010.

Species	Annual Total Point Estimate	95% Confidence Interval	Nominal Interaction Rate (no. birds per 1,000 hooks)
Black-footed albatross	65	[37 - 108]	0.002
Laysan albatross	155	[93 - 237]	0.004

Source: Point estimates and 95% conf. interval are from NMFS 2011. Total number of hooks is taken from PIFSC 2010 Hawaii longline logbook summary report.

3. SIGHTINGS OF ESA-LISTED SEABIRD SPECIES

The distribution of three seabirds listed under the ESA overlap with the areas where the Hawaii longline fishery operates: short-tailed albatross, Newell's shearwater, and Hawaiian dark-rumped petrel. The short-tailed albatross and the Hawaiian dark-rumped petrel are listed as endangered, and the Newell's shearwater is listed as threatened. Figures 5 and 6 show the locations of short-tailed albatrosses sightings by observers and observed fishing effort by Hawaii longline vessels

from 2004-2010. In 2010, there were two sightings of short-tailed albatross in the shallow-set fishery and none in the deep-set fishery. To date, there have been no observed interactions (hooking or entanglement) between Hawaii longline fishing gear and short-tailed albatrosses. Also, there have been no observed sightings or interactions with Newell's shearwater, or Hawaiian dark-rumped petrel in either fishery.

4. PROTECTED SPECIES WORKSHOPS

Each year, owners and operators of pelagic longline vessels must complete a NMFS Protected Species Workshop. A valid workshop certificate is necessary for owners to receive and renew Federal longline fishing permits.

Fishermen learn from oral presentations, hands-on demonstrations, videos, and printed reference materials. The workshop includes training in sea turtle, marine mammal, and seabird identification, handling and release techniques, and a review of regulatory requirements.
In 2010, NMFS trained a total of 101 participants at 20 workshops in American Samoa, and another 150 participants at 21 workshops in Hawaii. NMFS also offers an online protected species workshops for those vessel owners and captains that have completed one classroom workshop in the past three years. Of the 206 certificates issued in Hawaii, 56 of them were issued to owners and captains who took the online workshop.

Protected species workshop in the classroom.

Protected species workshop on line.

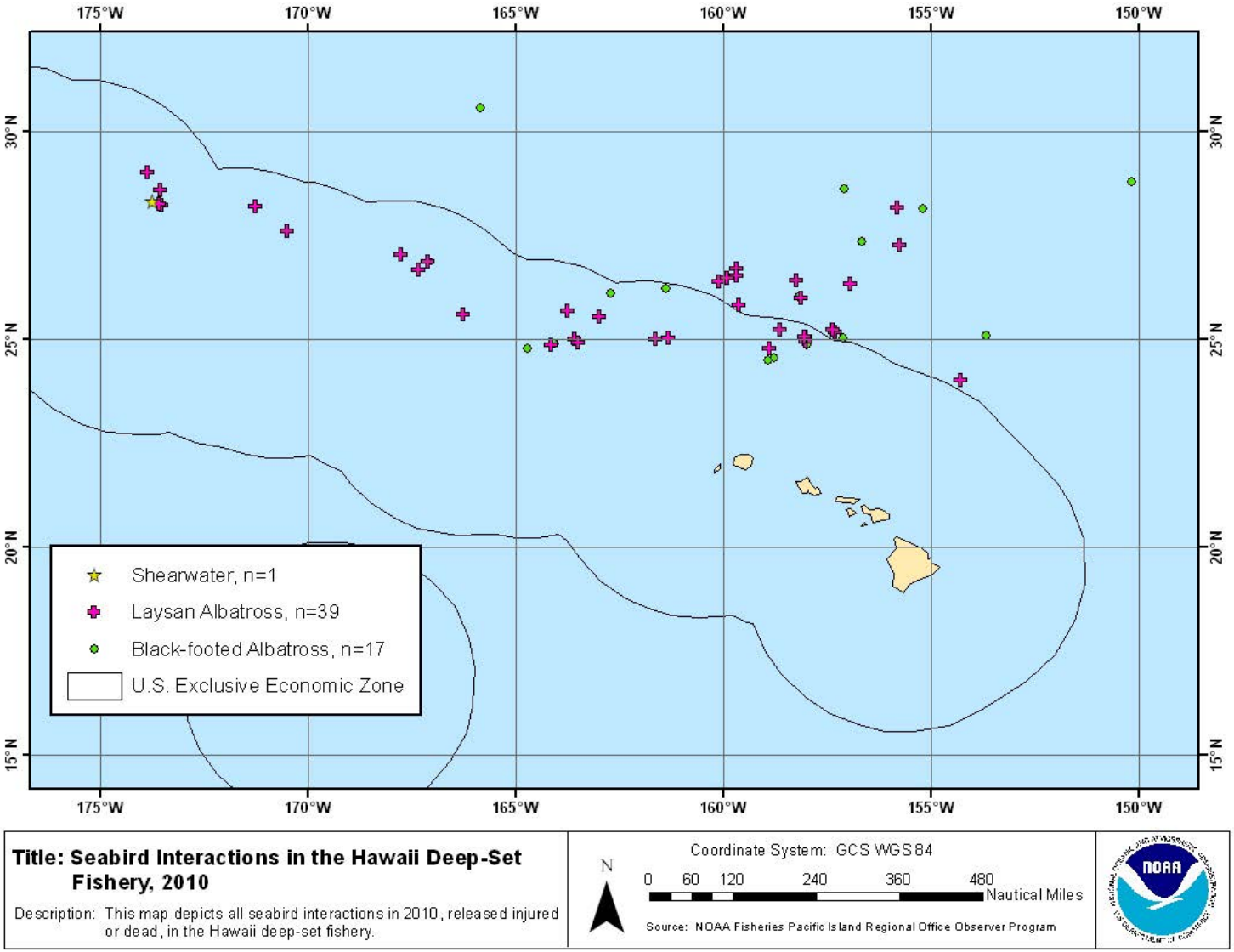

Figure 3. Locations of seabird interactions in Hawaii longline deep-set fishery, 2010.
Source: NMFS unpublished.

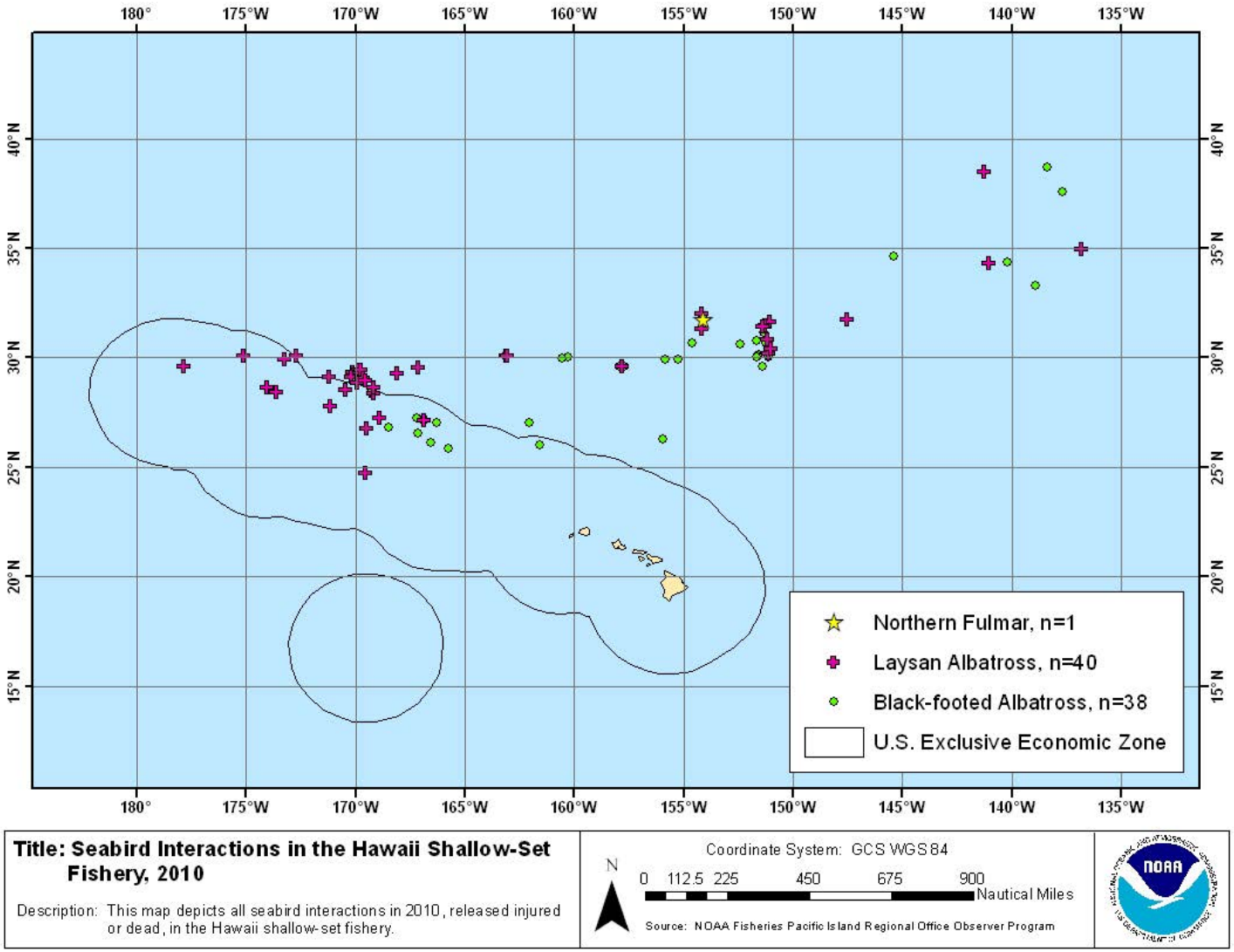

Figure 4. Locations of seabird interactions in Hawaii longline shallow-set fishery, 2010.
Source: NMFS unpublished.

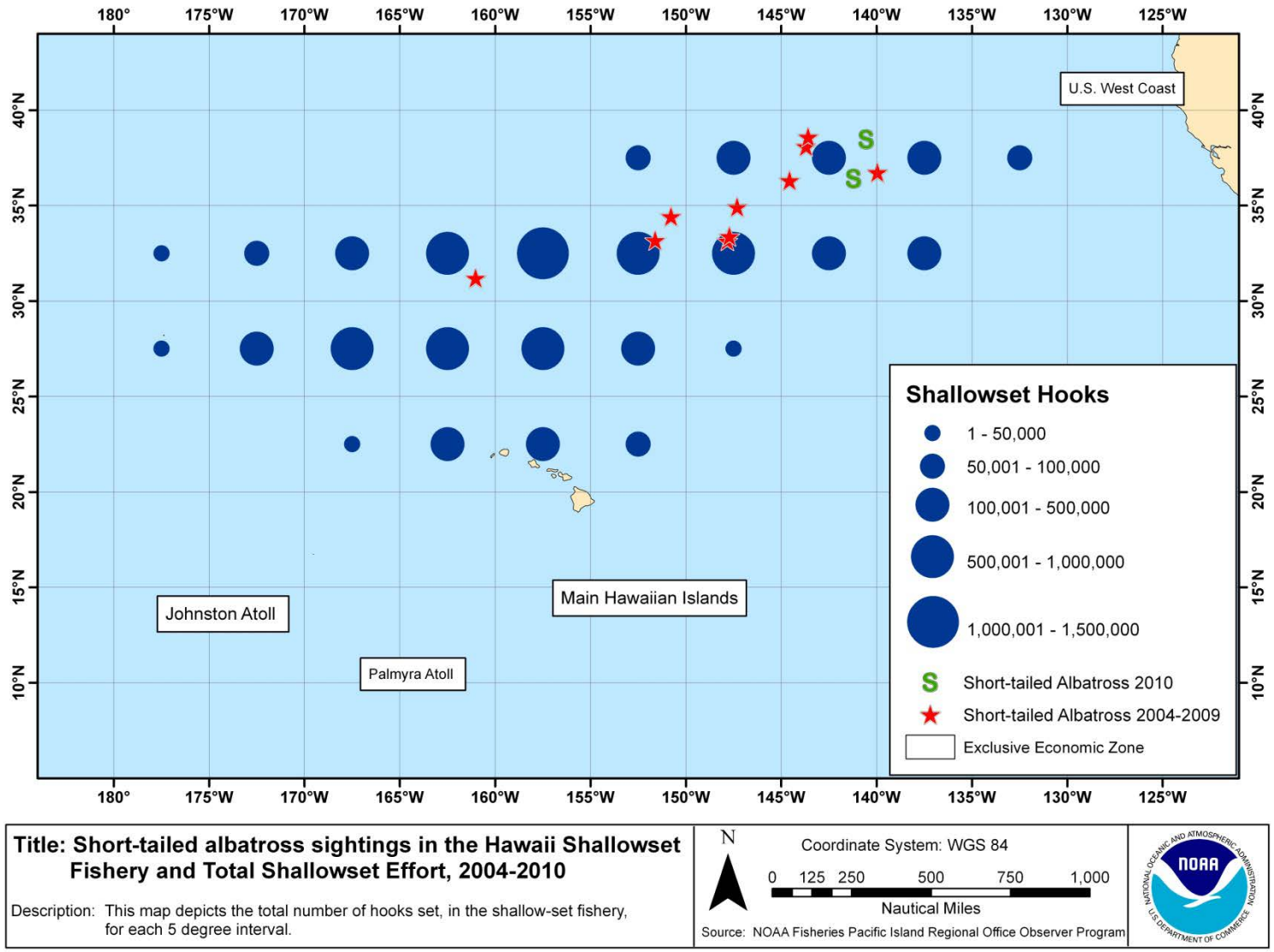

Figure 5. Observed fishing effort and short-tailed albatross sightings for Hawaii shallow-set longline vessels, 2004-2010.
Source: NMFS unpublished.

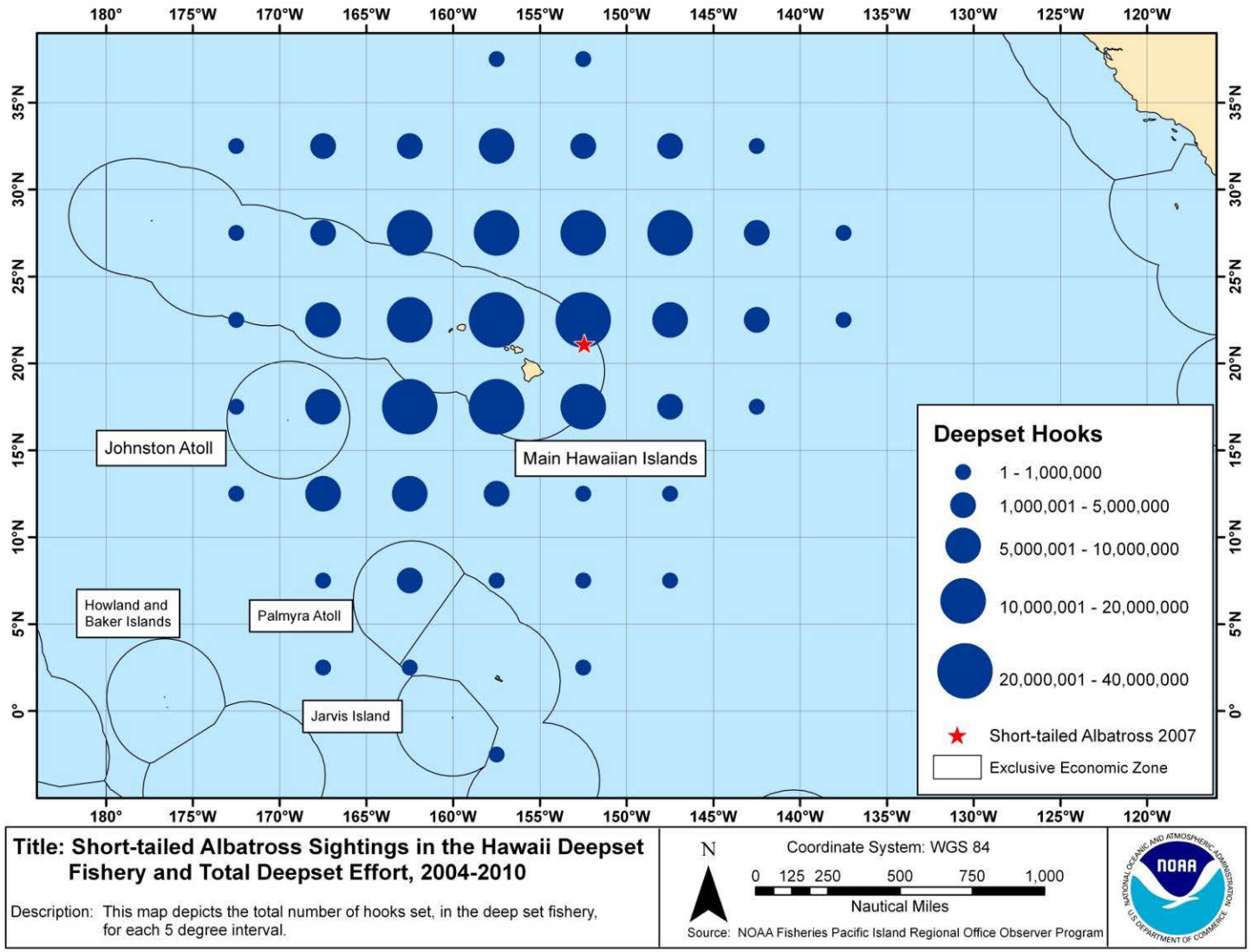

Figure 6. Observed fishing effort and short-tailed albatross sightings for Hawaii deep-set longline vessels, 2004-2010.
Source: NMFS unpublished.

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