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Options Paper for Management of the Hawaii Shortline Fishery

October 13, 2009

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Introduction

Commercial fishing using kaka-line and shortline gear has been reported since 1999 to the present in the State of Hawaii logbook system (i.e. commercial marine license (CML) reporting system). This gear is similar to longline gear, however, its length is less than one nautical mile (nm) or 1.85 km while standard longlines may extend for thirty or forty miles. Shortlines are not subject to existing federal regulations governing longline fishing implemented through the Western Pacific Regional Fishery Management Council's (Council) Pacific Pelagics Fishery Management Plan.

There may be potential stimulus for the shortline fishery to expand due to several factors, including constraints placed on Hawaii's longline fisheries by the advent of international longline fishing catch limits for bigeye and yellowfin tuna. Expansion, if realized, could lead to gear conflicts among different pelagic-targeting sectors such as trollers and handline or *ika shibi* fishers.

Prior gear conflicts within the Hawaii-based longline fleet arose during expansion of the longline fleet in the early 1990's. At that time Pooley (1990) identified three factors that exacerbated the conflict: (1) the "new" longliners set their gear shallower than traditional operations, catching more yellowfin tuna and marlins; (2) they oriented their longlines perpendicular to the direction that the old sampan fleet deployed their lines; and (3) they set their gear in areas frequented by trollers. Therefore, in 1992 Amendment 5 created a closed area around the main Hawaiian Islands and Guam. This longline exclusion zone has largely mitigated that conflict and coincidentally has provided some degree of protection to summer yellowfin spawning and winter bigeye runs (D. Itano, pers.comm. 2009).

Later in 1996, gear conflicts between Hawai'i-based longline vessels and handline vessels occurred at the Cross Seamount, located approximately 290 km south of Honolulu. The longline vessels that began fishing there set their gear at very shallow depths and snagged handline vessels' gear. Although the Council held public meetings in 1997 to address this issue, the consensus among fishers was that no new regulations should be imposed. This conflict was removed by voluntary relocation of the longline vessels away from the Cross.

Problem Statement

There is some speculation that shortline use may increase in the near future due to: the federal closure of the commercial bottomfish fishery in the Northwestern Hawaiian Islands in 2011, other sectors of the economy going further into recession, or with implementation of the longline fishery bigeye tuna catch limit and potential concomitant early annual closure of the fishery should the catch limit be reached. Concerns have been expressed by some fishery participants and managers that currently fishing with shortline gear is unregulated except for the required adherence to the State of Hawaii's commercial marine license (CML) reporting requirements and a prohibition from fishing in the Northwestern Hawaiian Islands. Whereas Hawaii-based longline fishery participants

must adhere to a multitude of regulations, including a prohibition on fishing in the longline closed area around the main Hawaiian Islands which varies seasonally from 25 to 75 nm. Increased shortlining activity may lead to gear and user conflicts between shortliners and other gear types (e.g., longliners outside the longline closed area, trollers and other non-longline pelagic fishers (NLPF) inside the closed area) depending on how many vessels participated and in what areas, and localized depletion of bigeye or other pelagic management unit species (PMUS).

A search of the State of Hawaii Division of Aquatic Resources (HDAR) Commercial Marine License database suggest that more than 70 fishermen have been or are currently active in the offshore pelagic shortline fishery (including mixed gear/hybrid trips) between 1999-2008.

At present, the U.S. longline bigeye catch limit for the Western and Central Pacific Ocean is 3,763 mt which is 90 percent of the 2004 landings by the Hawaii-based longline fleet. It is anticipated that this would be caught before the year's end, leaving the longline fleet the options of continuing to fish for non-bigeye tuna, fishing in the Hawaii swordfish longline fishery (which is subject to its own restrictions), moving to another port, ceasing fishing for the year, fishing in the eastern Pacific Ocean, or setting multiple shortlines as opposed to a single contiguous longline set.

Some operators may opt for continuing to target bigeye using shortline gear, given that a few longline vessels have reportedly successfully used shortline gear. Because they are not subject to federal longline regulations when shortlining, these vessels could fish over seamounts or in open waters including those within the 25-75 nm main Hawaiian Islands longline closed area. In addition, these vessels can set as many lines as desired as long as they are less than a mile of mainline.

One additional issue or area of consideration with regard to any future management and regulations pertaining to shortlining activity and gear is enforceability. Currently the U.S. Coast Guard is not equipped to measure a shortline and it is not known how the fishermen themselves measure their mainlines. Depending on how measurement is done, set sag will affect the length and, therefore, if measurement is being done using GPS distance, it would be inaccurate as the submerged mainline is actually longer (see Figure 1).

Definitions of Shortline Gear

For the purposes of this options paper, shortline gear means any fishing gear meeting the definition of longline gear except that it is less then 1 nautical mile (nm) in length.

The Code of Federal Regulations does not explicitly define shortline gear but defines longline gear as follows:

Under Section 600.10 Magnuson Stevens Act Provisions defines longline as:

"Longline means a line that is deployed horizontally and to which gangions and hooks or pots are attached. Longlines can be stationary, anchored, or buoyed lines that may be hauled manually, electrically, or hydraulically."

While Section 665.12 Western Pacific Fisheries defines longline gear as:

"Longline gear means a type of fishing gear consisting of a main line that exceeds 1 nm in length, is suspended horizontally in the water column either anchored, floating, or attached to a vessel, and from which branch or dropper lines with hooks are attached; except that, within the protected species zone, longline gear means a type of fishing gear consisting of a main line of any length that is suspended horizontally in the water column either anchored, floating, or attached to a vessel, and from which branch or dropper lines with hooks are attached."

And Section 665.12 (3) defines fishing gear as including:

"Fishing gear, as used in subpart D of this part, includes:

(3) Hook-and-line, which means one or more hooks attached to one or more lines."

The State's definition also uses the 1 mile threshold whereby shortline fishing is defined as "Fishing using a horizontal mainline, less than one nautical mile in length and suspended from the ocean surface with floats, from which leaders with baited hooks are suspended. The State also defines vertical line fishing as "Fishing using a vertical line mainline, suspended from the surface with float, from which leaders with baited hooks are attached and ending with a terminal weight."

The one mile threshold is intended to allow for the continued use of 'kaka-lines' by small boat pelagic fishermen in Hawaii's EEZ waters, without subjecting them to the requirements of an existing longline limited entry program.

Definition of Kaka line

In Appendix A of the Council's 2001 Coral Reef Ecosystem Fishery Ecosystem Plan:

"Kaka line (set line) means fishing with a mainline less than one nautical mile in length from which branch lines of baited hooks are attached. Line is set horizontally, on or near the bottom, or in shallow mid water."

History of Shortline Use in Hawaii

Cross Seamount

The Cross Seamount is one of 38 seamounts situated southwest of the Main Hawaiian Islands. Seamounts, submarine features usually found in areas of the deep sea, provide habitat for marine species that do not use the surrounding deep sea habitat. The area of the Cross Seamount was fished by Hawaii based longline vessels for several years prior to exploitation by the offshore handline fishery. The earliest handline fishing trip to the Cross Seamount noted by any of the surveyed fishermen was made in 1976.

Bigeye tuna appear to aggregate over Cross Seamount at least partially to feed, appearing at dawn at the upcurrent, southwest edge of the plateau to feed on specific micronekton layers which are migrating downward from the shallow scattering layer. At this time, bigeye tunas occupy a very small area of the plateau, are highly mobile, and form very loose aggregations. During the early morning hours, bigeye spread and occupies the southwest end of the plateau, still feeding. By late morning, they occur over the plateau area south of the summit. During the afternoon and early evening, bigeye occupy the entire area of the plateau and tend to form thicker aggregations. At around sunset, they start dispersing and seemingly leave the plateau, to appear next dawn again at the upcurrent edge. However, it is possible that they stay over the seamount as tight aggregations that are spread over the entire area of the plateau are much easier to miss during transects. As opposed to bigeye tuna, large, thick aggregations of fish, likely to be monchong (lustrous pomfret, *Eumegistus illustris*), appear after sunset and occupy the entire area of the plateau, approximately 50 m off the seafloor. At sunrise they descend along the flanks, predominantly on the upcurrent side of the plateau, and occupy depths of the deep scattering layer at 500-750 meters.

There are several species of pomfrets or monchong (Bramidae) that are taken as incidental catch in the Hawaii-based longine fisheries, including the bigscale pomfret (*Taractichthys steindachneri*) taken in open water and the larger lustrous pomfret (*E. illustris*), the seamount and deep-slope associated species. After developing the deep-set longline technique to target large bigeye tuna, it became apparent that large quantities of *E. illustris* were also available over the seamount summit. By modifying the gear slightly, it was found that the gear could effectively target this species of monchong while also catching medium and large bigeye tuna. More recently, a few of the long-term operators in this fishery have pioneered the use of 'short-lines' or longline < 1 nm in length, which is not regulated as a longline under current federal regulations.

One gear configuration used in targeting monchong uses two or more sub-surface floats instead of surface hard floats. These sub-surface floats are only slightly positive in buoyancy; their purpose is to keep the deeper set gear from fouling the seamount summit while maintaining the gear at depth. Another important modification to the monchong gear is the addition of more branchlines spaced very closely and the use of smaller circle hooks. A monchong targeting set may deploy 200 hooks in the same length of mainline

(Itano 2004). Figure 1 shows a typical monchong set of 200 hooks on less than one nm of mainline.

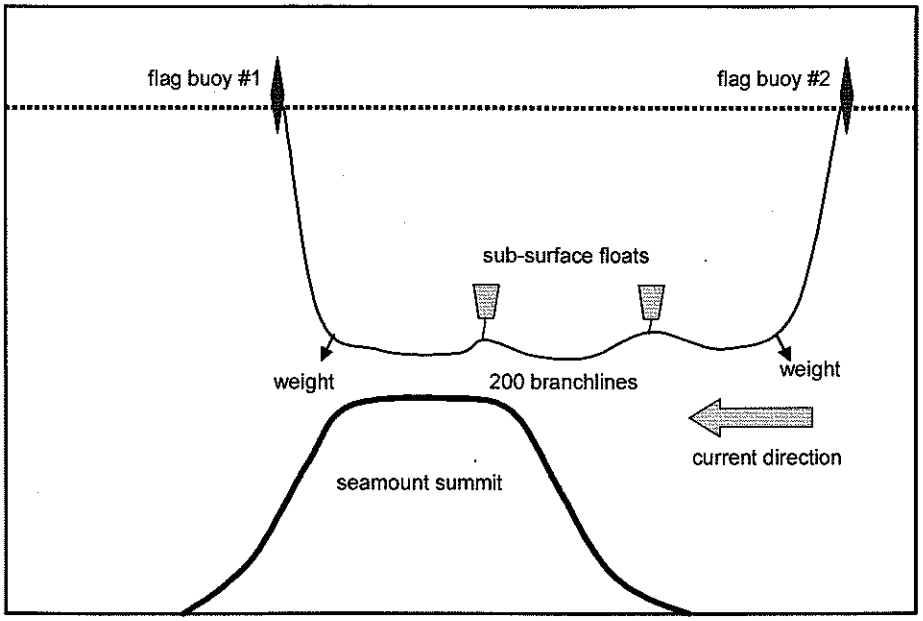

Figure 1: Monchong Targeting Set Upcurrent of Seamount
Source: Itano (2004)

In the 1990's fishermen raised concerns that removal of juvenile tunas from the Cross was resulting in fewer tuna available for Hawaii's inshore fisheries. Tagging studies were undertaken to examine the dynamics of tuna aggregations including that at the Cross. Results of one study by Adam et al. (2003) indicated that bigeye tuna are more resident at the Seamount than yellowfin tuna, and larger bigeye tunas tend to reside longer than smaller individuals. This may result in larger fish being more vulnerable to capture in the Seamount fishery. The tagging results showed a relatively low level of exchange between the Seamount and the inshore and longline fisheries (Adam et al. 2003).

Some operators on the Cross have used shortline gear as configured in Figure 2 to target bigeye tuna but have also adapted this gear to target seamount monchong, shown in Figure 1. This innovation has also contributed to concerns about the offshore handline/mixed gear fishery because bigeye tuna continue to be subjected to overfishing across the Pacific, and seamount monchong are likely to be a more limited resource, with stronger site fidelity than the more cosmopolitan tunas. Participation in the offshore fishery including the Cross has declined quite markedly (Figure 3), however, nominal catch rates, in terms of catch per trip, have increased overall, especially for bigeye tuna (Figure 4).

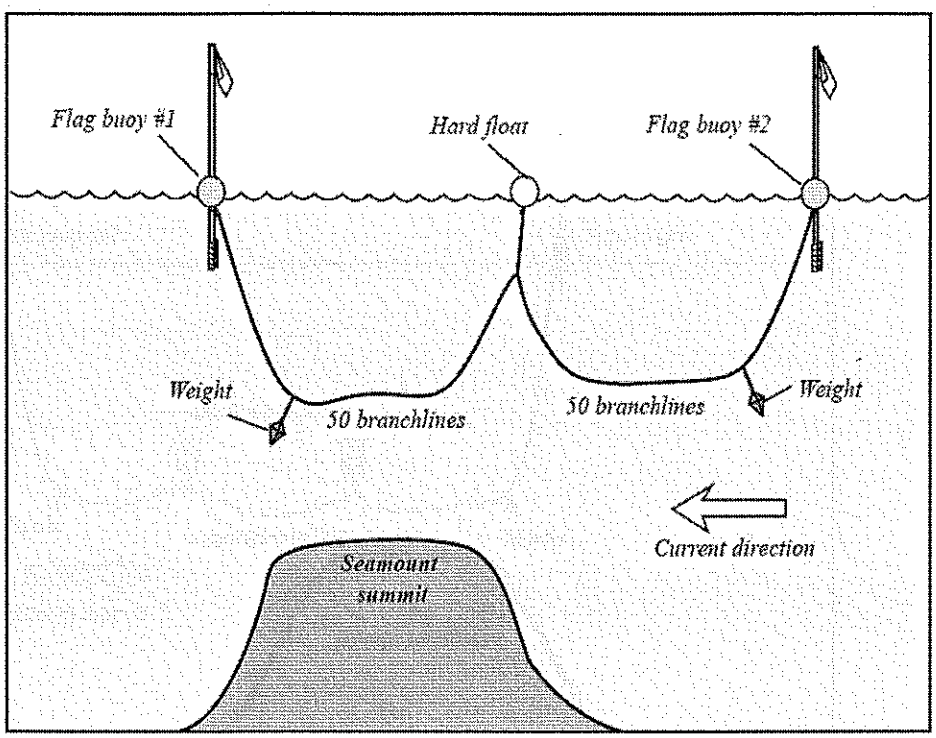

Figure 2: Bigeye Targeting Set Upcurrent of Seamount
Source: Beverly et al. (2004)

Cross Seamount has also been of sporadic interest to the Hawai'i-based longline fleet, especially in the 1990's. Captains tend to pursue relatively large bigeye along the slopes of the seamount (Itano 2004). Handline-longline fleet interaction issues have been problematic at times, especially when longline captains conduct shallow sets over the seamount near the smaller vessels. This led to incidents in which longline gear and handline vessel parachutes have become entangled. Additional offshore handline issues that have periodically proven to be challenges to effective management include reported pricing issues when large quantities of handline-caught tuna arrive at the auction block (saturation) and extensive landings of juvenile bigeye and yellowfin. More recently, one regular fisherman operating on the Cross Seamount employing shortlines and handline gear has also used a shortened version of a regular longline.

Cross Landings

Total landings from Cross seamount have been variable since reporting began in 1991 as shown in Figure 3 below. Catch of bigeye from the Cross has increased since 2003 while gear types utilized have evolved from tuna handline to hybrid and shortline (Figure 4). Other gear types reporting bigeye catches from the Cross include troll, vertical line, and other miscellaneous gears.

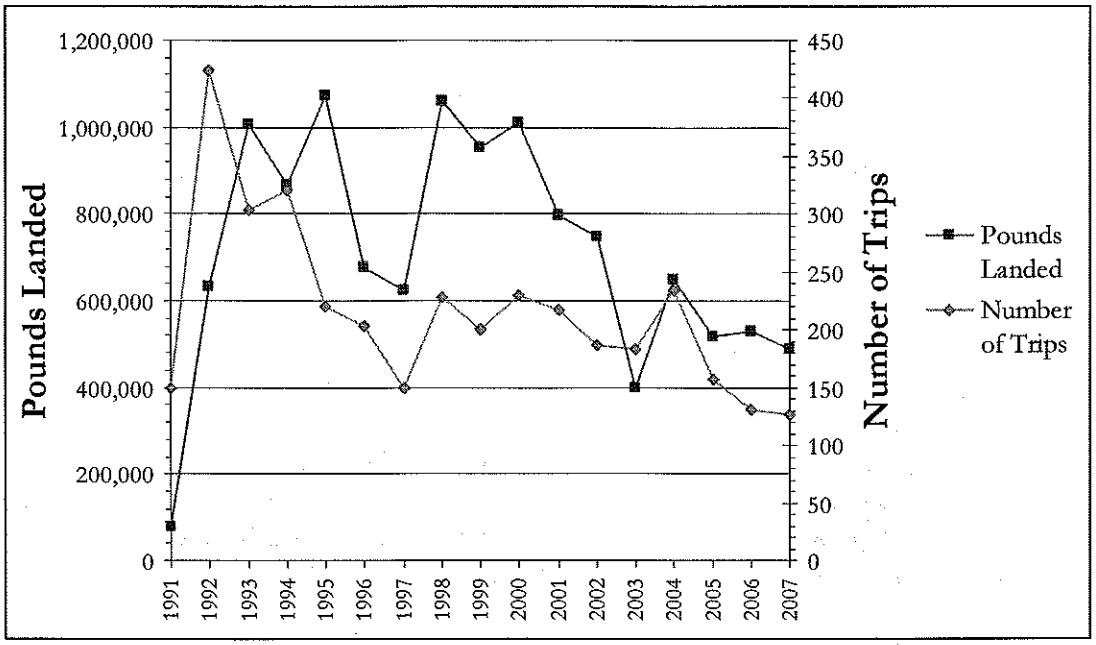

Figure 3: Catch and Fishing Effort for the offshore Tuna Handline Fishery for Cross and the Offshore Weatherbuoys
Source: HDAR data

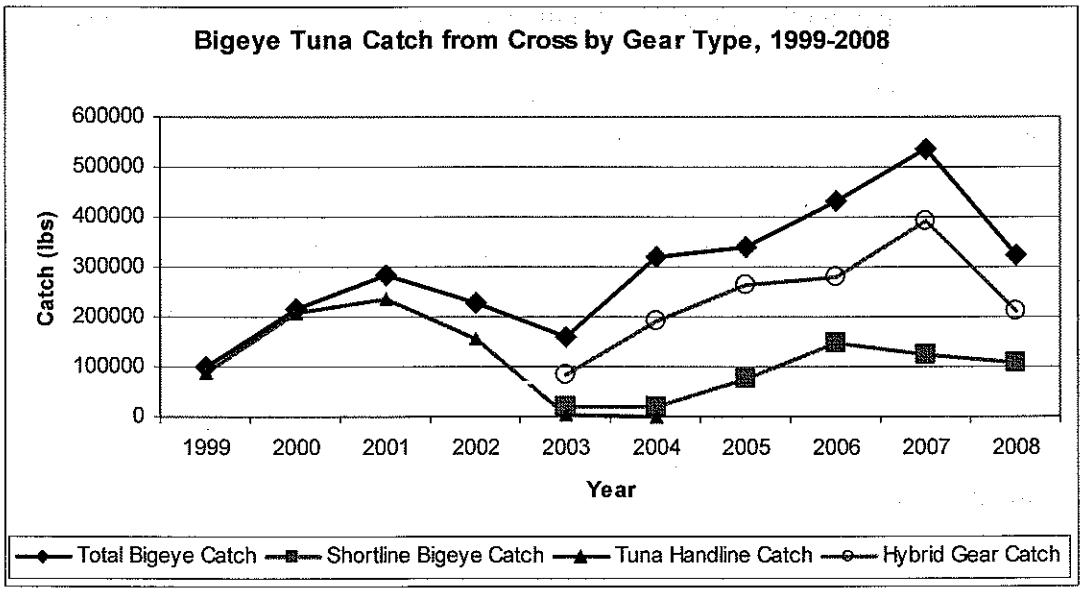

Figure 4: Bigeye Tuna Catch from the Cross Seamount by Gear Type, 1999-2008
Source: NOAA Fisheries

Main Hawaiian Islands Other than Cross

Fishing by various line configurations including kaka-lines and shortlines has been occurring for many years in waters around the Hawaiian Islands. Landings using kaka-line or shortline gear have been reported from Hawaii-based boats from 1999 to the present by the State's CML logbook system. In the early years, catches using kakalines were comprised of a variety of species.

All reports from the early years (1999-2002) were from kaka-line gear (shortline was not an option under gears on the logbook prior to 2003). They reported catching a large variety of species including various bottomfish, opelu, mahimahi, ono, yellowfin tuna; and a variety of other nearshore and reef-associated species including taape, weke, menpachi, moana, laenehi (wrasse) and others (Table 2). The decade of catch reports from the kaka-line and shortline fishers represent a lot of trips with small amount of catch (<50 fish) and few trips with large catches (>100 fish). Catch ranges from 0 fish to nearly 350 fish for one trip and the majority of trips catch less than 50 fish.

There were no reports of shortline gear in the CML database prior to 2003. From 1999-2008 a total of 300,134 lbs of pelagic landings were reported from shortline users (not including at the Cross seamount). Some fishers appear to have started targeting bigeye tuna in 2003 and landings have been variable since that time with an increase since 2006 to the present (Figure 7). Shortline catches from 2003-2008 are dominated by bigeye and yellowfin tuna, among others (Figure 8).

Shortline gear, when used by experienced fishers can be very effective. Seasonally, there are areas nearshore to the MHI for which setting shortlines can be very effective which has been demonstrated on the east Maui, Alenuihaha Channel and Haleakala Ridge area for bigeye in the winter (D. Itano, pers.comm. 2009). There are other times when the state FADs are loaded with bigeye and user conflicts have occurred between local trollers and small handline boats and vessels which typically target the Cross Seamount, fishing on those aggregations (D. Itano, pers.comm. 2009).

Figure 5 presents an overall picture of the scale of the reported landings coming from kaka-line and shortline gear fishery participants. Figure 5 displays the landings (pounds of fish caught) on individual trips and aggregated by month, from 2003 -2008. The years before 2003 had scant landings and so were not included in this figure. Most landings are reported during the winter months most likely for the holiday demand for tuna. In the shortline fishery around the main Hawaiian Islands, the majority of trips result in reported landings less than 1,000 lbs and a small number of 'highliners' who report catches of more than 1,000 lbs for individual trips.

	BIGEYE TUNA	MAHIMAHI	YELLOWFIN TUNA	Grand Total Catch including other spp.
2003	30,920	3,982	7,665	44,378.5
2004	23,935	4,429.5	2,857.5	33,086.6
2005	24,468.5	193	45	25,980.3
2006	3,354	246	57.5	5,013.3
2007	3,050	1,100	170	20,014.2
2008	36,740	3,420	27,370.5	73,710
	122,467.5	14,756.5	39,227.5	300,133.9

Table 1: Reported Landings from the MHI (except Cross) for the Kaka Line/Shortline Gear Type, 1999-2008
Source: NOAA Fisheries
Note: Grand totals include numerous other spp. not included on this table due to confidentiality or other issues

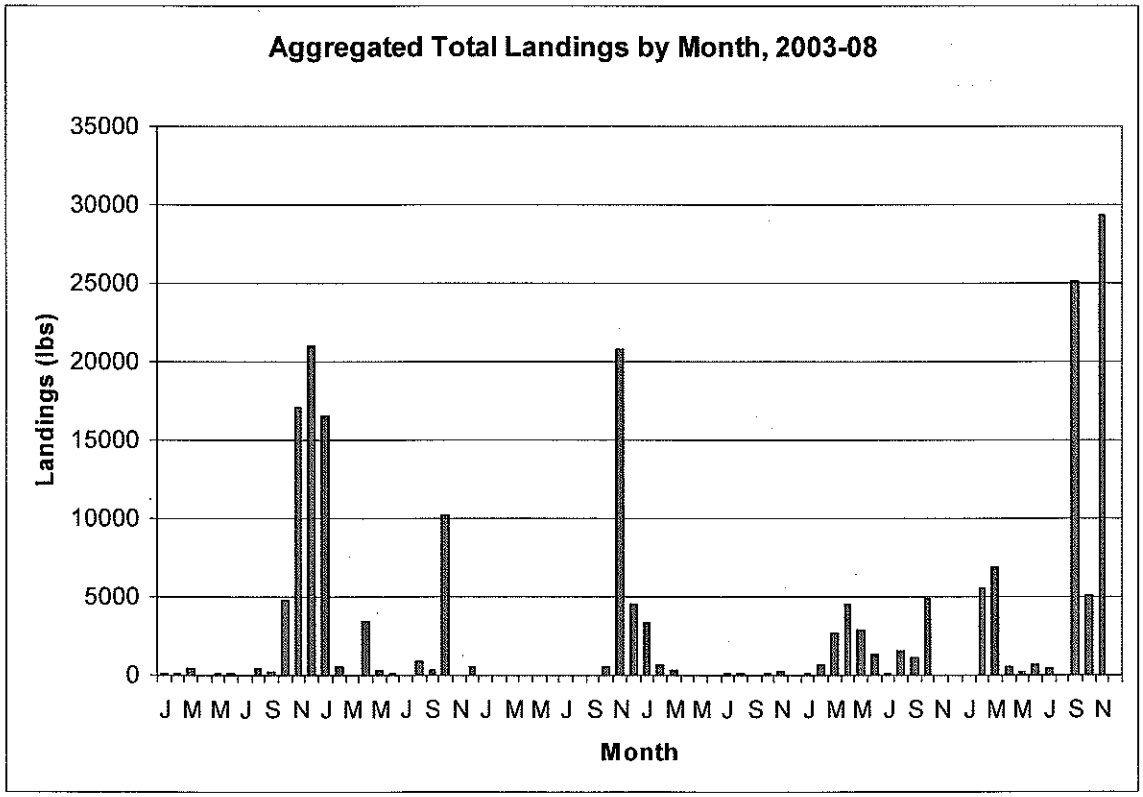

Figure 5: Total Landings Reported from all Kaka-line and Shortline Trips, aggregated and by Month, 2003-2008

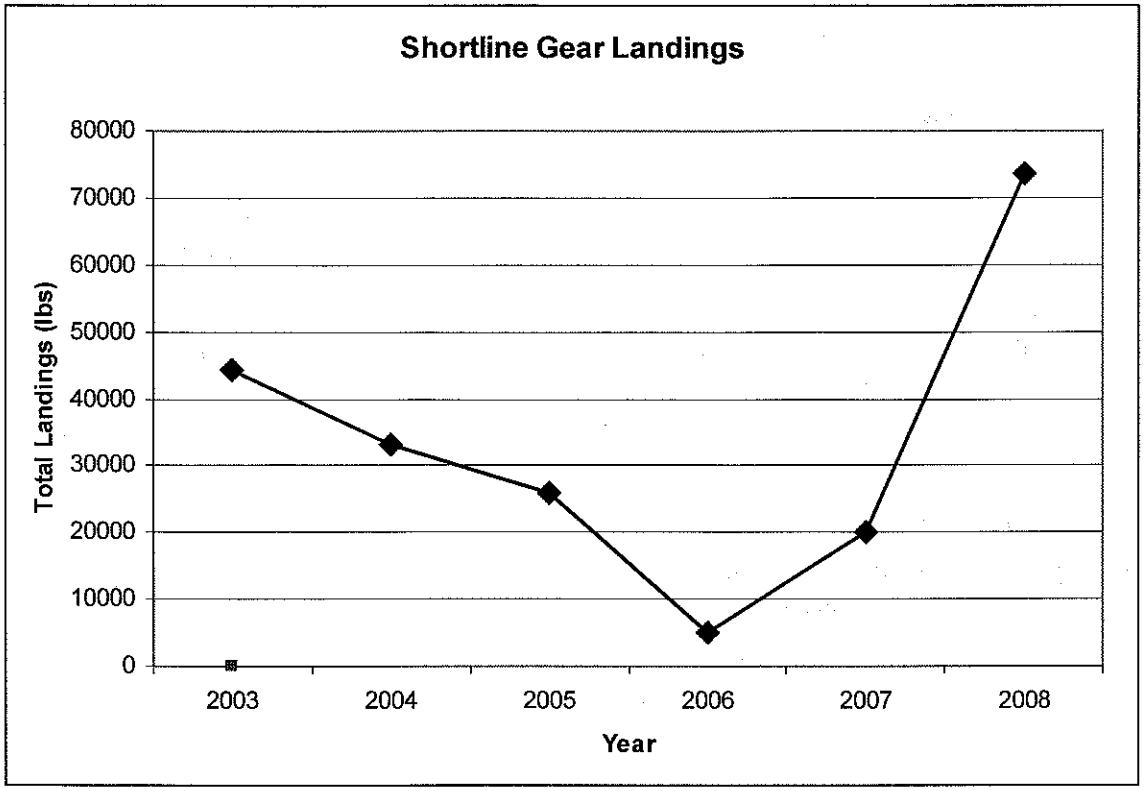

Figure 5: Total Reported Landings in the MHI excluding the Cross Seamount from Shortline Gear

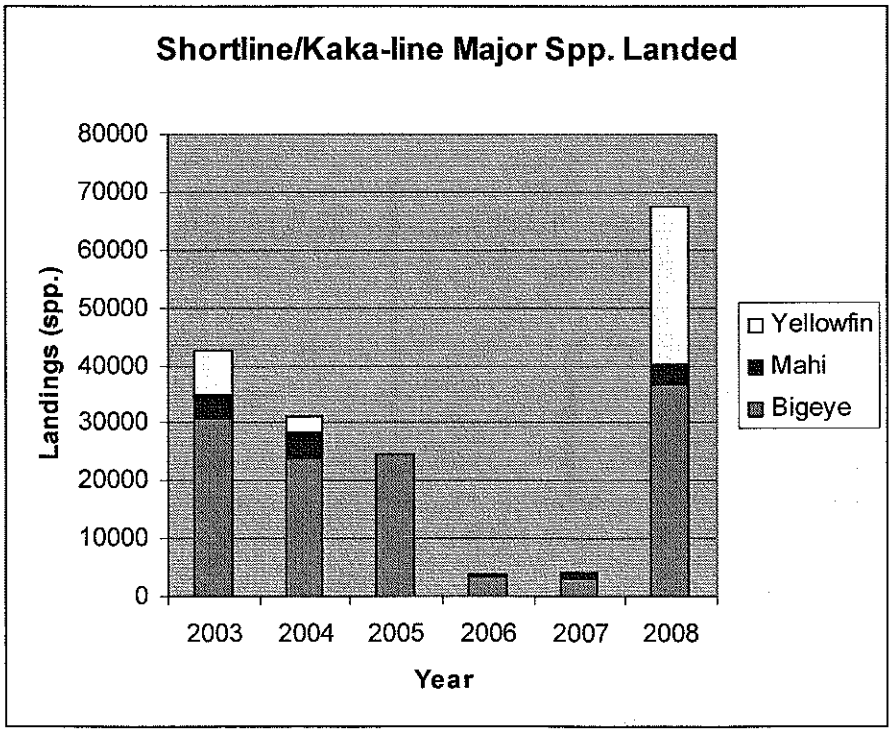

Figure 6: Major Species in Shortline Catch Reports, 2003-2008

Table 2: Reported Kaka-line and Shortline Landings by Percent Ranking, 1999-2008

Species	Total Catch Reported (1999-2008)	%	Cum %
BIGEYE TUNA	122,468	40.80%	40.80%
All Others	95,837	32.00%	72.10%
YELLOWFIN TUNA	39,228	13.07%	85.17%
MAHIMAHI	14,757	4.92%	90.09%
WHITE PAPIO/ULUA	11,252	3.75%	93.83%
OPELU	4,814	1.60%	95.44%
AKU	4,157	1.38%	96.82%
MENPACHI	1,536	0.51%	97.33%
ONO	1,235	0.41%	97.75%
BLUE MARLIN	1,194	0.40%	98.14%
TIGER SHARK	1,120	0.37%	98.52%
OPAKAPAKA	775	0.26%	98.78%
UKU	613	0.20%	98.98%
ONAGA	243	0.08%	99.46%
TAAPE	166	0.06%	99.51%
LAENIHI	118	0.04%	99.55%
LEHI	99	0.03%	99.65%
EHU	86	0.03%	99.68%
KALEKALE	82	0.03%	99.74%
KAWALEA	80	0.03%	99.76%
HAPUUPUU	78	0.03%	99.79%
A'AWA	70	0.02%	99.81%
KAKU	62	0.02%	99.83%
WEKE NONO	27	0.01%	99.92%
PAPA	26	0.01%	99.93%
MOANA	15	0.00%	99.97%
	300,134	100.00%	

Hawaii-based Longline Fishery Background

The Hawaii-based longline fishery is the largest fishery managed by the Council in the western Pacific accounting for the majority of Hawaii's commercial pelagic landings. The fleet includes a few wood and fiberglass vessels, and many newer steel longliners that were previously engaged in fisheries off the U.S. mainland. Vessels are limited to 101 ft in length and the total number is limited to 164 vessels by a limited entry program. The longline fleet has historically operated in two distinct modes based on gear deployment: deep-set longline by vessels that target primarily bigeye tuna and shallow-set longlines by those that target swordfish or have mixed target trips including albacore and yellowfin tuna. Vessels are monitored by vessel monitoring systems (VMS) and a federal logbook reporting system.

During the 1980s, tuna longline effort began to expand to supply developing domestic and export markets for high quality fresh and sashimi grade tuna. In the late 1980s and early 1990s, the nature of the fishery changed completely with the arrival of swordfish and tuna targeting fishermen from longline fisheries of the Atlantic and Gulf States and longline effort increased rapidly from 37 vessels in 1987 to 138 vessels in 1990. An emergency moratorium was placed on the rapidly expanding fishery in 1991. The limited access program was established in 1994 allowing for a maximum of 164 transferable longline permits for vessels ≤101 feet in overall length that is administered by NMFS. During the same year, the Hawaii Longline Observer Program was initiated, primarily to monitor interactions with protected species.

Pelagic longline fishing was restricted from use within a buffer zone surrounding the main Hawaiian Islands to reduce gear interactions and conflicts between longliners and trollers. Specifically, Amendment 5 put into place a prohibition on longline fishing within 75 nm of Oahu, Kauai, Niihau, and Kaula; and within 50 nm of Hawaii, Maui, Kahoolawe, Lanai, and Molokai (57 FR 7661; March 4, 1992). Further buffer zones were established within a 50 nm radius of the Northwestern Hawaiian Islands to minimize interactions with the endangered Hawaiian monk seals, yet these are now subsumed by the Papahanaumokuakea Marine National Monument.

Options

The following list of management options is considered preliminary. Forthcoming meetings with fishery participants are expected to yield further options and issues for Council consideration.

To address concerns surrounding shortline fishing activity around the main Hawaiian Islands, several options are described below:

1. No-action

Under Option 1, using shortline gear in U.S. EEZ waters would continue to be unregulated, except for the State of Hawaii's CML reporting requirements.

2. Require Permits and Reporting for Shortline Fishers

Under Option 2, all fishery participants using shortline gear in U.S. EEZ waters would be required to obtain a valid permit and fill out and submit logbooks.

3. Prohibition in Closed Area

Under Option 3, fishing with shortline gear would be prohibited from waters in the longline closed area.

4. Large Vessel Prohibition in Closed Area

Under Option 4, large vessels (>50 ft) would be prohibited from using shortlines to fish in the longline closed area.

5. Limit the Number of Shortlines

Under Option 5, no more than XX number of shortlines would be able to be fished concurrently by any single vessel.

6. Limit to non-longline Vessels

Under Option 6, no vessel that has a current longline permit would be allowed to use shortline gear.

Brief Analysis of Management Approaches

A summary of the major advantages and disadvantages of each approach is shown in Table 3.

Table 3: Summary of Major Pros and Cons of the Approaches Considered

Approach		Pros	Cons
1	**No-action**	No increase or decrease in administrative costs	Shortlining may increase and gear conflicts may arise between trollers and shortliners
2	**Require Permits and Reporting for Shortline Fishers**	Would provide information on this fishery which may be used in future to limit entry or set a sector ACL	Increased administrative and enforcement costs
3	**Prohibition in Closed Area**	No possible gear conflicts between shortliners and other NLPF/BF/rec vessels in the closed area	Shortline fishers may be displaced from their fishing grounds within the area closure Increased administrative and enforcement costs
4	**Large Vessel Prohibition in Closed Area**	Would allow small longline vessels to use shortlines closer to shore & without conflicts with longlines	Enforcement would have to ensure compliance w/in closed area based on sizing vessels May still allow for gear conflicts between shortliners and troll/other NLPF vessels in the closed area

Approach		Pros	Cons
5	**Limit the Number of Shortlines**	Intended to ensure many shortlines are not connected to the point of 'becoming a longline'	Difficult to enforce without observers and small vessels may not be equipped to house observers May unduly impact participants by decreasing their fishing efficiency Increased administrative and enforcement costs
6	**Limit to non-longline Vessels**	Would ensure longline vessels don't use this 'loophole' to continue targeting bigeye after catch limit is reached Would allow for a shortline fishery to continue and grow without increased competition from longliners and w/o conflicts between them	Enforcement would have to ensure longline vessels are not setting shortlines which would be difficult to do Increased administrative and enforcement costs

Council Action

At its 145th Council meeting, the Council directed staff to write an options paper for the October 2009 meeting that considers management alternatives for short lines within the current 50-75 nautical mile longline area closure around the Main Hawaiian Islands.
It is expected that at the 146th meeting, the Council will review the options and consider future management based on one or more the options considered, recommend inclusion of additional options; or recommend no action be taken at this time.

References

Adam, M.S., J. Sibert, D. Itano and K. Holland. 2003. Dynamics of bigeye (*Thunnus obesus*) and yellowfin (*T. albacares*) tuna in Hawaii's pelagic fisheries: analysis of tagging data with a bulk transfer model incorporating size-specific attrition. Fish. Bull. (101): 215-228.

Beverly, S., E. Robinson and D. Itano. 2004. Trial setting of deep longline techniques to reduce bycatch and increase targeting of deep-swimming tunas. 17th Meeting of the Standing Committee on Tuna and Billfish Working Paper FTWG-WP-7a. 28 pp.

Itano, D. 2004. Trial setting of deep longline techniques to reduce bycatch and increase targeting of deep-swimming tunas. Presented at the 17th Standing Committee on Tuna and Billfish. Majuro, RMI. 11-18 August 2004. Fishing Technology Working Group. FTWG-WP-7A. 7 pp.

Pooley, S. 1990. Hawaii Longline Fishing Controversy. Tuna Newsletter 97. NMFS-SWFC, Honolulu Laboratory. May 1990.