

Economic Performance and Status of the American Samoa Longline Fishery, 2014¹

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(Drafted on January 22, 2015; revised on March 3, 2015)

Purpose: The purpose of this PIFSC Internal Report to the Western Pacific Regional Fishery Management Council (Council) is to document the dynamic changes in the economic health of the American Samoa longline fishery. This brief summary includes a comparison of the cost-earnings status for the 2001 operating year vs. the 2009 operating year. In addition, this report presents a long-term trend of net revenues of the fleet for the period from 2006 to 2014. These trend data, collected through a routine data collection program, illustrate the declining trend in net returns to the fishery, offering an insight to the fishery collapse in 2013. An earlier report (PIFSC Internal Report IR-14-020) provided to the Council covered the period 2006 to 2013.

Cost-Earnings Status of 2009 Operations: A cost-earnings study (Arita and Pan, 2013) found that in 2009, the average annual revenue per vessel was \$448,817, just slightly higher than total expenditures; as a result, the average annual cash return (profit) per vessel was \$6,379. Table 1 shows the detailed figures of revenue, variable costs, fixed costs, labor costs, and net cash return (profit) for an average vessel of the American Samoa longline fleet operated in 2001 and 2009. Among 23 active vessels surveyed in 2009, 48% suffered net losses from fishing operations. If depreciation of a vessel is considered, the average profit to an owner was negative per vessel. Rising fuel costs, which accounted for approximately 27% of total expenditures, coupled with relatively low revenues (due to lower albacore CPUE), were the major factors leading to poor economic performance.

Comparison with 2001 Cost Earnings Study: In general, the 2009 cost-earnings status was much worse compared to 2001 operations as described by O'Malley and Pooley (2002.) While

¹ PIFSC Internal Report IR-15-015
Issued 27 March 2015

the average vessel generated net cash return (profit) to an owner of \$177,207 in 2001, the average vessel in 2009 generated only \$6,379, a 96% decrease compared to the profit in 2001. The detailed cost-earnings data of the American Samoa fleet based on 2001 operations (O'Malley and Pooley, 2002) are also listed in Table 1.

Table 1. Cost-Earnings Performance in 2001 and 2009 of the American Samoa Longline Fishery.

	2009	2001	% Change
<u>Average Annual Revenue per Vessel</u>	448,817	657,063	-32%
<u>Average Annual Trip Costs per Vessel</u>	268,016	200,923	33%
Fuel	121,648	73,314	66%
Oil	6,064	5,085	19%
Freezer Operations	8,389	10,090	-17%
Bait	53,312	60,318	-12%
Provisions	20,109	22,739	-12%
Communication	3,846	n/a	
Fishing Gear	22,843	29,378	-22%
Misc. Trip Costs	31,804	n/a	
<u>Average Annual Labor Costs per Vessel</u>	78,167	177,894	-56%
Total Captain Share	30,594	68,421	-55%
Total Crew Payments	47,573	109,474	-57%
<u>Average Annual Fixed Costs per Vessel</u>	96,256	101,039	-5%
Mooring	3,365	6,480	-48%
Bookkeeping	3,467	1,609	115%
Insurance	24,970	26,533	-6%
Loan Payments	19,251	35,578	-46%
Other Fixed Costs	3,413	8,180	-58%
Drydock Costs	16,541	4,077	306%
Overhaul Costs	5,584	1,558	258%
Major Repairs	10,761	3,333	223%
Routine repairs	8,904	13,691	-35%
<u>Average Total Annual Expenditures per Vessel</u>	442,438	479,856	-8%
<u>Average Annual Net Return per Vessel</u>	6,379	177,207	-96%

Data sources: 2001 data are from O'Malley and Pooley (2002), and 2009 data are from (Arita and Pan, 2013)

There are two main changes in the cost-earning status of 2009 vs. 2001. First, average overall revenues in 2009 per vessel fell by 32% compared to 2001. A decline in albacore CPUE was the main factor that contributed to lower revenues in 2009 because albacore was the main component of the catch. In 2009, CPUE was approximately 14.8 fish per 1000 hooks, which was 56% lower than the 2001 CPUE of 34 fish per 1000 hooks. If we measure CPUE by fish per set (as opposed to fish per 1000 hooks), CPUE fell from 66.5 fish per set in 2001 to 45.5 fish per set in 2009, a 32% decline.

Second, there was a substantial increase in variable costs. Annual variable costs (trip expenditure) increased by 33%. The substantial increase in fuel expense, 66% more compared to 2001, was the major driver of overall cost increases. On the other hand, annual fixed costs in 2009 were 5% lower than 2001. Annual labor costs per vessel declined 56% compared to 2001. The decline in labor costs implied that crew received lower payments, thus, fishermen's income from fishing operations were greatly reduced in 2009 compared to in 2001.

When comparing the economic status of these two years, it is important to note that the O'Malley and Pooley study in 2002 estimated revenues based on a subsample of longline vessels, which may not have been a representative sample of all vessel activity. O'Malley and Pooley also indicated that the revenue may have been overestimated because, during the study period, the majority of vessels arrived in midyear. Albacore are more abundant from May to October in American Samoa's waters (Domokos et al., 2007) than in the early months of the year, hence the catch per unit effort (CPUE) figure after midyear is usually higher than the annual average. In contrast, the revenue data used to evaluate the fishery's 2009 economic performance were based on a full year of logbook data for each vessel in the surveyed sample, reflecting a more accurate depiction of vessel performance. As a result of these methodological differences, our ability to meaningfully make comparisons between the two studies has that limitation.

The Fishery Collapse of 2013: At the end of 2013, the majority of the vessels in the American Samoa fleet were tied up at dock, and 18 vessels posted "For Sale" signs, according to the *Samoa News* of December 18, 2013. The collapse of the fishery seems inevitable due to the poor economic performance resulting from the continuous decline in CPUE, increases in fuel prices,

and a sharp drop in albacore prices in 2013. The cost-earnings study (Arita and Pan 2013) had already indicated a thin profit margin for the American Samoa longline fleet in 2009.

A sensitivity analysis shows that if CPUE of the main catch species (albacore) is lower than 14.3 fish per 1000 hooks, and the price is \$2,200 per metric ton (\$1.00/lb), while holding other factors unchanged, the profit (net cash return) for an individual vessel would be negative. In 2009, the albacore CPUE was 14.8 fish per 1000 hooks and the albacore price was \$2,200 per metric ton. Therefore, the profit in 2009 was very close to zero. In 2013, the albacore CPUE declined to 11.9 fish per 1000 hooks from 14.8 fish per 1000 hooks in 2012, and albacore prices declined to \$2,200 per metric ton from \$3,249 per metric ton in 2012. Obviously, the decline of both CPUE and the price of albacore yielded a negative profit.

In addition, the continuous economic data collection program that has monitored the economic performance from 2006 to the present (Pan et al., 2012) showed that fishing costs continued increasing after 2009. Figure 1 illustrates the revenue and variable costs by fishing set from the period 2006 to 2013. The variable costs presented in the figure include costs of diesel fuel, engine oil, bait, freezer operating costs, gear, provisions, communications, and miscellaneous items, but do not include labor costs. The data were collected on a trip base. However, since the trip length (total days of a fishing trip) for the American Samoa longline fleet varied substantially across years, the cost per set (usually one set a day) is a better index for a cost comparison across years. In 2013, fishing costs exceeded revenues. Obviously, fleet operations cannot be continued with negative cash returns.

The net revenue per set (Figure 2) further illustrates the poor economic performance of the fishery in recent years. During the period 2006 to 2014, net revenue per set fluctuated but in a declining trend. The net revenue in 2011 and 2012 was \$244 and \$713 per set, respectively, much lower than the net revenue in 2009 (\$1,307 per set). Yet, it further declined in 2013 to a negative -\$372 per set.

The economic performance of the American Samoa longline fleet in 2014 slightly improved based on the logbook data January 2014 to October 2014 (data for the last two months aren't available yet). Compared to 2013, 2014 revenue per set increased to \$1933 per set from \$1765 per set in 2013. Variable costs, which mainly included fuel and bait costs but excluded labor

cost and fixed costs, were \$1553 per set in 2014. Thus, positive trip net revenue yielded in 2014. However, in order for an owner to gain profit from fishing, the net revenue should be about 40% of the trip revenue², thus the owner would have a sufficient amount of net revenue to pay for the labor cost and fixed cost (e.g. insurance and major repairs). In other words, for a boat owner to earn a profit in 2014 comparable to that in 2009, the net revenue should be at least \$761 per set. However, the actual net revenue was \$380 per set in 2014.

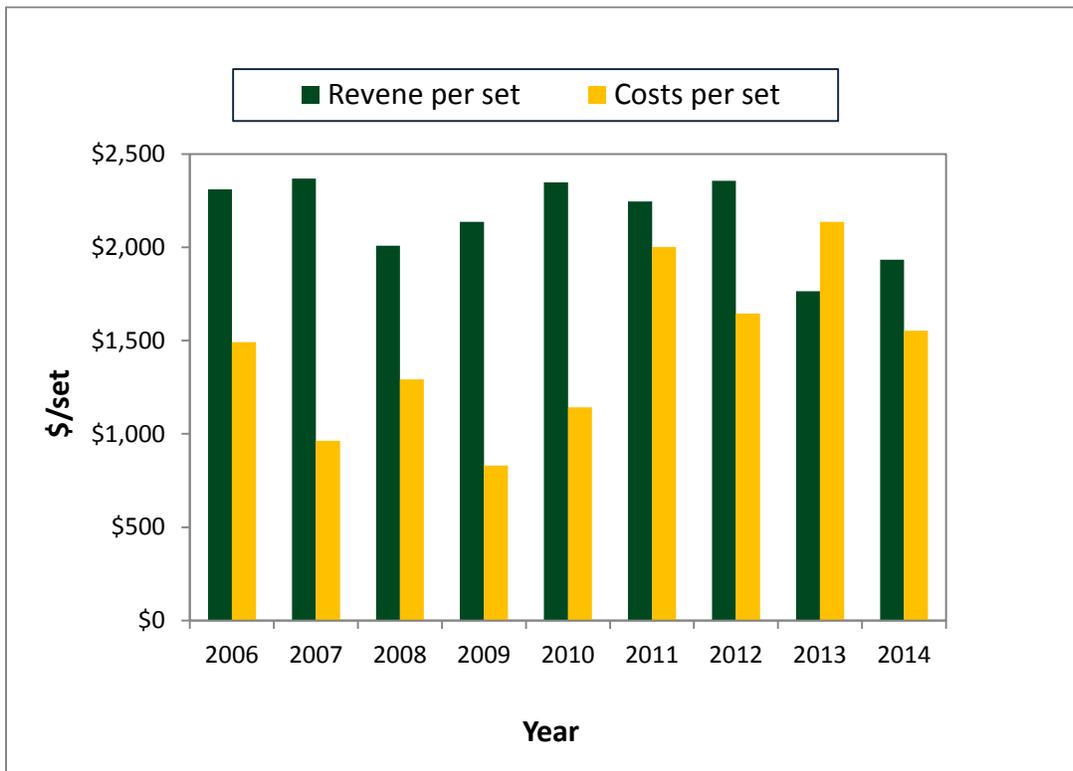


Figure 1. Revenue and cost per set of American Samoa Longline Fishery, 2006-2014³.

² According to 2009 cost-earnings study (Table 1), for the 100% revenue earned, 60.6% was spent on the trip expenditure, 17.7% went to pay for the captain and crew, 21.8% went to fixed costs for repairs, insurance, and other essentials, and only 1.5% went to the boat owner.

³ Revenue in 2014 is a preliminary estimate based on 2014 January to October PIFSC logbook and price data.

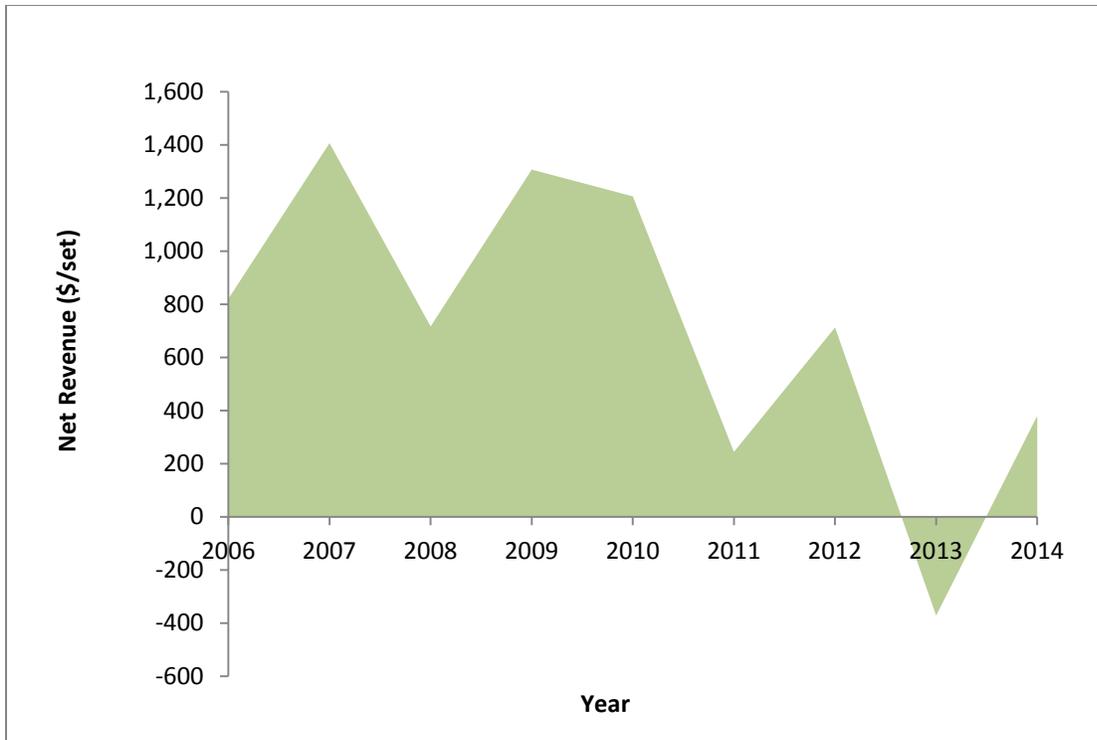


Figure 2. Net Revenue per Set of American Samoa Longline Fishery, 2006-2014.

Data sources for Figures 1 and 2: cost information is from the Continuous Economic data Collection Program from 2006 to 2014 (Pan et al., 2012), and revenue per trip for 2006-2013 is calculated using the annual revenue and the number of sets collected by PIFSC's WPacFIN Program and published at http://www.pifsc.noaa.gov/wpacfin/as/Pages/as_data_5.php. 2014 revenue data were provided by internal request from the FMRD PIFSC. Revenue in 2014 is a preliminary estimate based on 2014 January to October logbook and price data.

As discussed previously, fixed costs were not included in Figure 2. Figure 3 presents the net revenue trend when fixed costs were considered. In Figure 3, the net revenue was defined as revenue minus variable costs and fixed costs, while net revenue in Figure 2 was defined as revenue minus variable costs. The fixed costs information of the American Longline fleet was available in 2009 and 2001 respectively when cost-earnings studies were conducted based the fishing operations of the two years. The average fixed costs per vessel were \$96,000 in 2009, while they were \$101,000 in 2001. Comparing the cost-earnings tables of 2001 and 2009, the difference in fixed costs between 2001 and 2009 did not appear to be large, although variable costs and labor costs experienced significant changes (see Table 1). The previous cost-earnings studies of the Hawaii longline fleet also demonstrated that fixed costs were more stable compared to other cost items. Based on this finding from the cost-earnings studies, we may assume that the fixed cost per set was stable during the period of 2006 to 2014 and similar to the 2009 level. Based on the logbook summary (http://www.nmfs.hawaii.edu/wpacfin/as/Data/Annual_Log/all09catsizemain.htm), the average number of sets per vessel was 189 sets in 2009. Thus, converting the figures from vessels to sets, the average of fixed costs was \$509 per set in 2009. Considering fixed costs, the fishing operations in 2011, 2013, and 2014 suffered negative revenue, as shown in Figure 3.

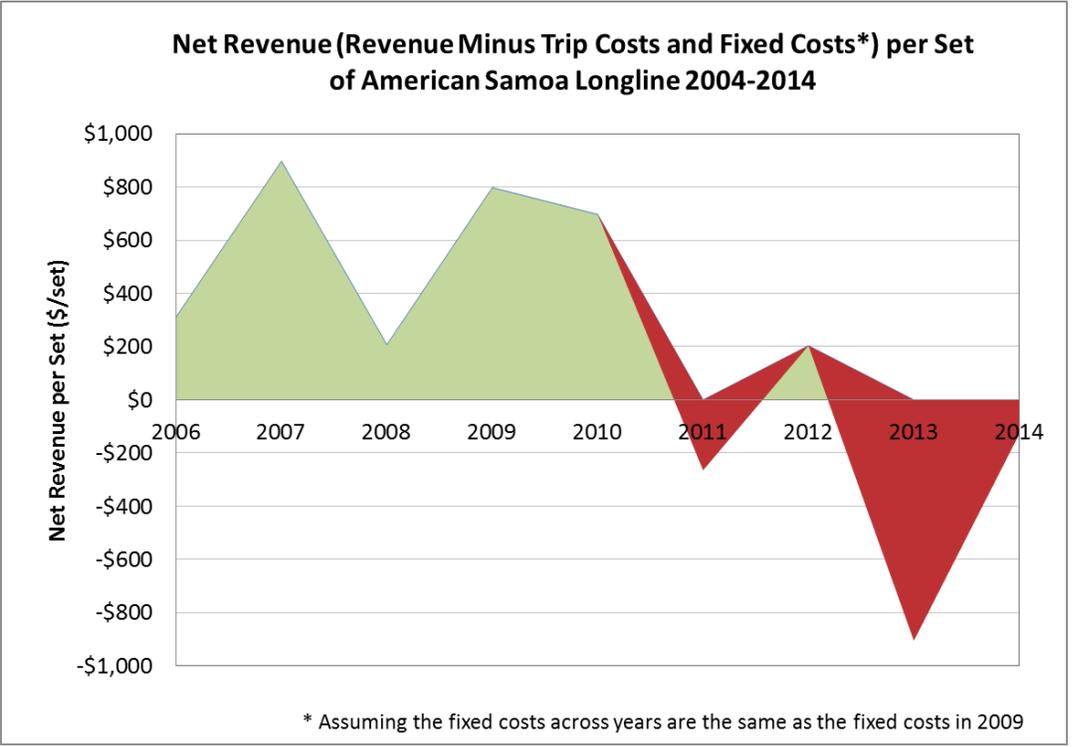
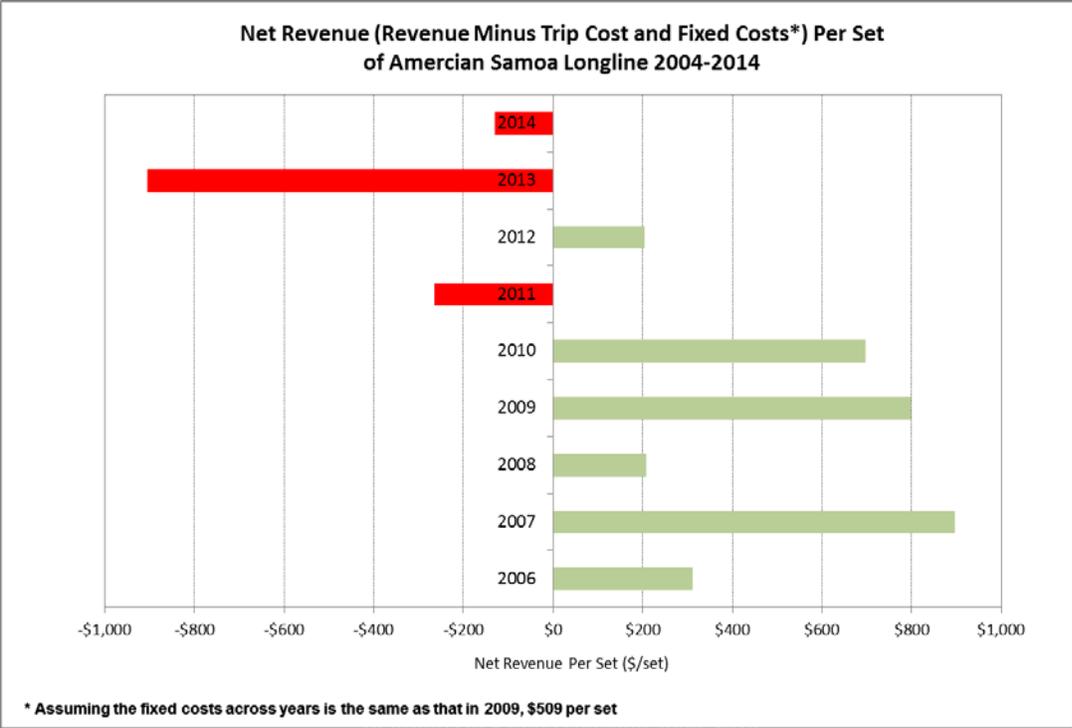


Figure 3. Net Revenue (Revenue minus variable costs and fixed costs per set) of American Samoa Longline Fishery, 2006-2014.

Conclusion: The cost-earnings study shows a thin profit earned in the American Samoa longline fishery in 2009 operations. Earnings to fishermen declined an average 56% for crew and captain, and 96% for a vessel owner. The economic performance became even worse in 2013, showing a negative return (even before charging fixed costs and labor costs) from fishing. The economic performance improved in 2014 over 2013. However, the earnings to the boat owners for the American Samoa fleet in 2014 may still be negative, after subtracting the fixed costs and labor costs. A sensitivity analysis shows that the net return of the fishery is tied to both the CPUE and the price of its main species, albacore. If the CPUE of albacore is lower than 14.3 fish per 1000 hooks (0.5 fish lower than the 2009 CPUE), or the fish price is lower than \$0.97/lb (3 cents less than the 2009 reported price), while holding other variables unchanged, the net return for an average vessel will be negative. Therefore, the recovery of the fishery would rely on a significant improvement of either fish catch rate or price, or a combination of both.

Cited Documents:

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