SCTB15 Working Paper

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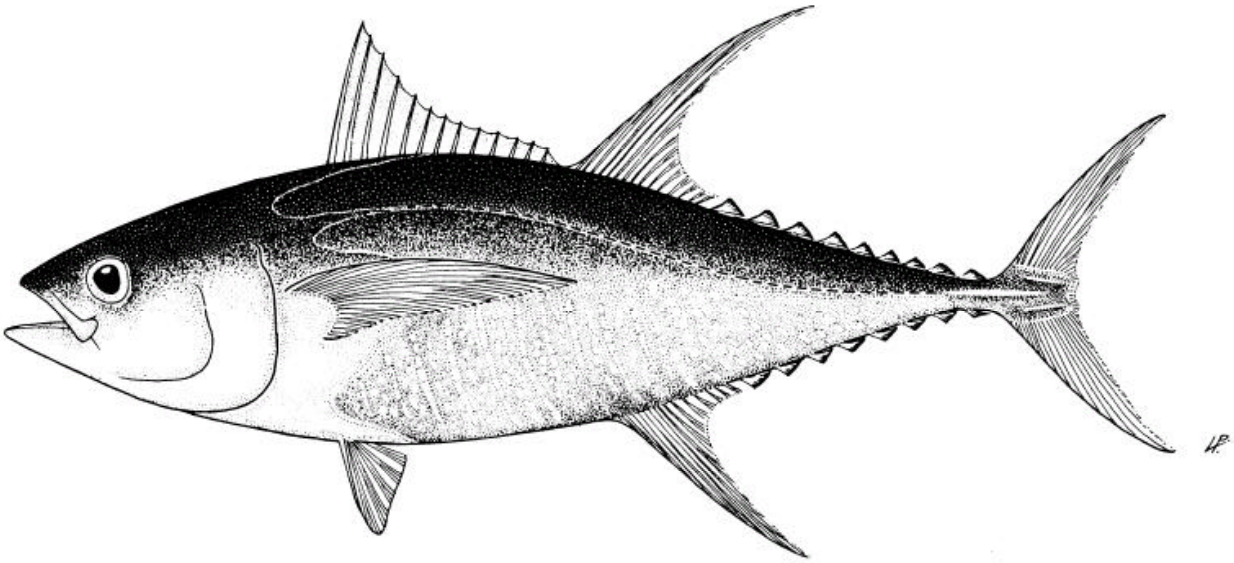
A Description and Economic Analysis of Large American Samoa Longline Vessels



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A Description and Economic Analysis of Large American Samoa Longline Vessels[1]

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INTRODUCTION

The American Samoa longline fleet underwent a major expansion and changed composition markedly in 2001 (Fig. 1). Before 2001, the longline fleet consisted primarily of local catamaran *alias* that targeted South Pacific albacore (*Thunnus alalunga*) for the two canneries in American Samoa and bigeye tuna (*Thunnus obesus*), yellowfin tuna (*Thunnus albacares*), skipjack (*Katsuwonus pelamis*), dolphin (*Coryphaena hippurus*), and wahoo (*Acanthocybium solandri*) for the canneries, local markets and subsistence. The *alias* are generally <30' in overall length, take 1 to 3 day trips, and have little or no modern technology. During 2001, however, 25 modern longline vessels, known locally and referred to herein as 'big boats', entered the fishery, which represented a major increase from the three big boats active in 2000. These vessels are >50' in overall length, possess modern communication and other fish finding technology, and have blast or brine freezers. The entrance of these big boats also resulted in abrupt increases in the number of hooks set and albacore catches by this fleet.

The sudden entrance of big boats into the American Samoa longline fleet has drawn considerable attention from fisheries managers. A number of issues have arisen due to this increase in fleet size and capacity. The Western Pacific Regional Fishery Management Council (WPRFMC) has classified these into three areas - avoiding gear conflicts, maintaining the potential for economically viable catch rates in the small-scale fishery, and maintaining cultural identity and dependence on ocean resources. A nearshore area closure has been implemented and a limited entry system is being considered. It is hoped that these two management devices will prevent any of the aforementioned problems.

The objectives of this study were to describe the big boats' physical characteristics, provide baseline economic information associated with operating these boats in the American Samoa longline fleet, and document fishers' opinions on specific management devices and other fisheries-related issues. This information is required by the Magnuson-Stevens Fishery Conservation and Management Act[2] to allow fisheries managers to consider potential economic impacts of future regulations.

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[1] A working document submitted to the 15th Meeting of the Standing Committee on Tuna and Billfish, Honolulu, Hawaii, 22-27 July 2002.

[2] SEC. 303 Contents of Fishery Management Plans 16 U.S.C. 1853 95-354, 99-659, 101-627, 104-297. (a) Required Provisions. – Any fishery management plan which is prepared by any Council, or by the Secretary, with respect to any fishery shall—(2) contain a description of the fishery, including the cost likely to be incurred in management, actual and potential revenues from the fishery.

METHODS

Data Collection

Available vessel owners, managers, or operators were interviewed by the senior author at Pago Pago Harbor from December 5 through December 21, 2001. Survey questions focused on variable costs (those incurred when the vessel actively fishes) and fixed costs (those incurred regardless of the number of trips the vessel takes) as well as vessel characteristics, demographics, and fishers' comments and preferences about future management alternatives. Commercial fishing industry members were also interviewed, and they provided pertinent ancillary information on the longline fleet.

Fishing expenditures and revenue data analysis

Only 5 of the 18 vessels included in the analysis fished in American Samoa throughout 2001. Based on logbook and vessel activity data of three of these vessels (the other two had not completed a full year of logbook reports) it was estimated that the average vessel could expect to make 17 trips a year if 14 sets were made each trip. The annual estimate for variable costs (e.g., fuel, bait, ice) was obtained by multiplying the costs per trip by 17.

Revenue information was estimated using methods similar to those employed in determining the number of expected trips per vessel/year. Revenue of the three vessels that fished all of 2001 and for which cannery landing weights were available was determined by multiplying the cannery weights by the 2001 species-specific price/ton. The 2001 Forum Fishing Agency (2002) prices were used for albacore ($2,496/mt), yellowfin tuna ($1,027/mt) and skipjack ($776/mt). The fishers provided the prices for bigeye tuna ($882/mt) and wahoo ($826/mt) directly. The 2001 annual revenue of an additional eight vessels, which had fished more than six months but less than a full year, was estimated by determining the monthly revenue in a similar manner as described above and extrapolating that to annual expected revenue.

Because this is a developing fishery a 'breakeven' estimation, the amount of landed fish needed to match expenses, is one method of determining the level of fishing effort necessary to sustain a big boat in American Samoa. This was estimated by calculating the amount of albacore (the primary target species) at the average 2001 prices that would have to be landed in order to match total 2001 costs. An analysis was conducted examining the breakeven point at different albacore prices.

RESULTS and DISCUSSION

Interviews

Twenty-two big boats were in Pago Pago Harbor between December 5 and December 21, 2001, and represented 79% of the big boat fleet at that time. A total of 18 vessels, 64% of the fleet, were willing to provide information via interviews. This also represented an 82% response rate for the survey.

Big boat vessel description

Vessels classified as a 'big boat' are large modern longliners. Vessels had or were in the process of installing either a blast or a brine freezer (two vessels use icemakers); used large hydraulic reels and

monofilament mainline; and were equipped with radar, GPS, VHF, SSB, temperature sensors, autopilot, and lineshooters.

Annual Costs

The reported total costs were estimated at $28,228 per trip, and total annual costs at $479,856 (Table 1). Labor was the highest cost to the American Samoa longline owner. Insurance was the highest individual fixed cost and fuel was the greatest variable cost.

Breakeven Points

Based on the average 2001 albacore price of $2,496/t ($1.13 price/lb) a vessel would have to land 424,651 lb of albacore to meet average annual fishing costs of $479,856. Given an average albacore weight landed by the American Samoa longline fleet of 45 lb, a vessel would have to land 9,437 albacore annually or 555 albacore per trip (based on 17 trips per year) or 40 albacore per set (based on 14 sets/trip) or 0.019 albacore per hook (based on 2,141 hooks/set). Logbook information from 10 vessels indicates that an average of 13,036 albacore was caught in 2001; therefore, the fleet was likely operating above expenses. Further analysis indicates that at the current (March 2002) price of $1,884/t, however, the fleet is barely meeting expenses and possibly only generating income through landings of incidental species. If the price continues to drop to $1,500/t the fleet will clearly be operating at a net loss (Table 2).

Fishers Responses to Limited Entry

The WPRFMC is currently considering implementing a limited entry program for the American Samoa longline fleet. Numerous methods of permit allocation have been suggested. Fishers were asked "Do you feel that the number of longline vessels (big boats) in American Samoa needs to be limited? Why? What do you feel is the optimal number of vessels?" Twenty percent of the fishers had no opinion on limited entry; ten percent felt the fishery would "take care of itself" meaning the profitable vessels would stay and those that were not would leave. The remaining 70% thought limited entry is a necessity for the fleet. Out of those 7 vessels, one felt that too many vessels offloading at the canneries would result in lower prices, three were concerned about potential overfishing, and three felt there would be gear conflicts with other big boats. There was no mention of potential gear conflicts with *alias*. According to the fishers who support implementation of a limited entry program, the average number of optimal big boats would be 37.

SUMMARY

The big boat segment of the American Samoa longline fleet operated at an estimated annual cost of $479,856 per vessel in 2001. The estimated breakeven point at the 2001 albacore price was 424,651 lbs or approximately 9,437 albacore. Logbook information from 10 vessels indicates that these vessels are landing albacore at a higher rate (586,611 lb or 13,036 fish) than necessary to meet expenses. Future revenue will be affected by cannery prices and the potential change in catch rates as this fishery matures. Future costs may also change if parts and services become more readily available, and the service and supply industry, which the fishery depends on, also matures.

Table 1. Estimated annual revenue and fixed and variable costs of the American Samoa big boat longline fleet.

Income Statement	**Average (US$)**	**Standard Deviation (US$)**	**n**
Fixed Costs Total	**101,039**		
Capital costs	35,578	11,856	16
Insurance	26,533	10,515	15
Bookkeeping	1,609	1,443	11
Mooring+	6,480	0	0
Overhaul	1,558	900	13
Dry dock	4,077	2,681.9	13
Daily maintenance	13,691	21,200	16
Other repairs in 2001	3,333	577	3
Misc. costs	8,180	3,643	10
Variable Costs Total*	**200,923**		
Fuel	73,314	44,969	16
Oil	5,085	3,588	14
Ice (for non-albacore catch)	10,090	4,165	10
Bait	60,318	21,582	16
Resupply fishing gear	29,378	21,706	16
Provisions	22,738	7995	16
Labor	**177,894**		
Captain's share	68,421		
Crew share++	109,474		
Total Costs	**479,856**		

*Presented as estimated yearly costs if 17 trips were made
+Estimated cost based on information provided by American Samoa Dept. of Port Admin.
++Crew share consists of 5 crewmembers earning 6,5,5,4 and 3 shares.

Table 2. Estimated breakeven points at various cannery prices for albacore and the 2001 vessel landing averages. Needed amount and poundage are based on vessel costs of $479,856 annually.

Needed to Meet Expenses	Albacore Price/Ton			2001 Vessel Average (std) n=10
	2001 avg. ($2,496)	2002, 1st qtr. $1,884	$1,500	
Poundage	424,651	564,536	685,509	586,611 (247,661)
Individual albacore*	9,437	12,545	15,234	13,036 (5,503)
Albacore/trip**	555	738	896	767 (324)
Albacore/set+	40	53	64	55 (23)
Albacore/hook++	0.019	0.025	0.030	0.026 (0.011)

*Based on average albacore weight of 45 lbs.
**Based on 17 trips/year.
+Based on 14 sets/trip.
++Based on 2,141 hooks/set.

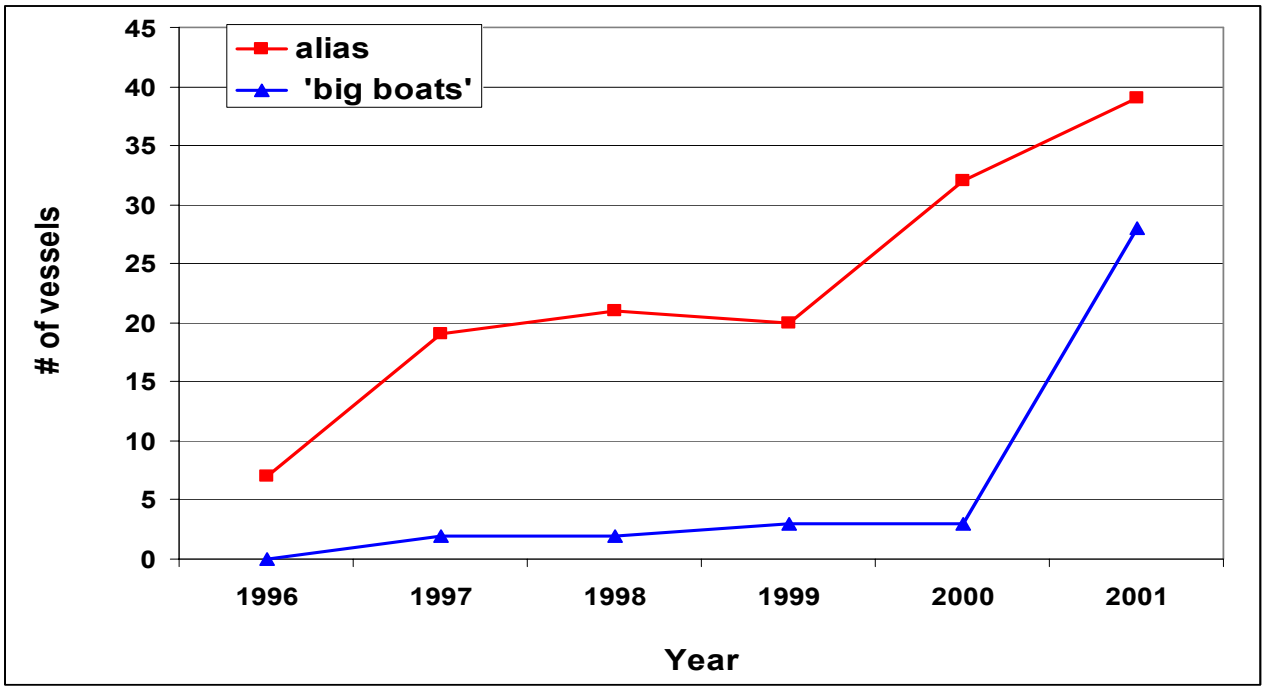

Figure 1. Number of American Samoa *alias* and big boats 1996-2001.