Submission of 2005 and 2006 U.S. Fishery Statistics For the Western and Central Pacific Ocean To the Western and Central Pacific Fisheries Commission[1]

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This is the third submission of annual fishery statistics by the Pacific Islands Fisheries Science Center (PIFSC), of NOAA's National Marine Fisheries Service (NMFS), to the Western and Central Pacific Fisheries Commission (WCPFC). The submission consists of provisional 2006 data for U.S. fisheries targeting tuna and tuna-like species in 2006, and updated data for 2005, unless otherwise indicated.

To more effectively and efficiently compile annual statistics by the overlapping areas of authority (or interest) of the WCPFC, the Inter-American Tropical Tuna Commission, and the International Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean, the PIFSC undertook further revision of its data processing procedures. While significant progress was made on this undertaking, the task is not yet complete, and for the most part this report contains the same kinds of information as were provided last year. However, this year we have added data on S. Pacific albacore trollers, and on the hooks between floats in the longline fisheries. And we have added data on the lengths of troll-caught albacore in the N and S Pacific, weight frequency data from the Hawaii troll and handline fisheries, and fish measurements made by the NMFS observer program in the Hawaii longline fishery.

Preparation of these statistics involved cooperation of staff from the PIFSC in Honolulu, Hawaii, and the Southwest Fisheries Science Center (SWFSC) in La Jolla, California. Contributions from PIFSC were prepared by staff of the Fisheries Monitoring and Socioeconomics Division, the Scientific Information Services Division, and the Information and Technology Services group.

Three categories of fishery data are provided: 1) Category I -- annual catch estimates and numbers of active vessels by fishing fleets (distant-water troll, longline, pole-and-line, purse seine, and small scale troll and handline), 2) Category II -- catch and effort (logbook) aggregated data for longline and distant-water troll, and 3) Category III – size (length or weight) data for key species and fisheries. The methods used in compiling the three categories of fishery statistics and other specifics are described below. For some fisheries, statistics were compiled by the year (calendar year 2005 and 2006) the catch was landed and for others they are compiled by

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the year the fishing gear was set or hauled. For the troll fishery targeting albacore in the South Pacific, data are also provided by fishing season (July of year x through June of year x+1). The procedure for determining the dates upon which to base summaries have not been standardized among all the fisheries, and may not match the standard used in last year's submission. In particular, in this year's submission the longline fisheries statistics for the Western and Central Pacific have been compiled by date of the fishing operation (both Category I and Category II), not date of landing. For the other fisheries, Category I data are usually summarized by year of landing and Category II data are summarized by date of operation. When we complete the development and documentation of final data summarization procedures we will apply the procedures to the historical data and submit revised statistics.

Category I: Statistics on Annual Catch and Active Vessels

The estimates of annual "catch" for 2005-2006 were compiled from a number of sources: 1) American Samoa Department of Marine and Wildlife Resources offshore creel survey catch data; NMFS Am. Samoa federal longline logbooks and NMFS size frequency cannery sampling program; 2) Guam Division of Aquatic and Wildlife Resources offshore creel survey catch data and commercial landings data; 3) Hawaii Division of Aquatic Resources (HDAR) Commercial Fisherman (catch data) and Marine Dealer (landings) data and federal longline logbook landings (fish kept) data (for Hawaii-based boats); 4) Pacific Fisheries Information Network (PacFIN) data which may contain landings data from all three U.S. Pacific coast States; and 5) Northern Mariana Islands Division of Fish and Wildlife Commercial Purchase landings data. Therefore, the U.S. annual catch statistics are nominally a mixture of estimated catches and landings. However, with the exception of the Hawaii fishery logbooks which do report discards (see below) the fishermen's' reports and the surveys generally include only kept catch (landings).

In using logbook data to compute Category I landings statistics for longline fisheries, catches in numbers of fish kept, by species, were summed for those longline sets located in the WCPO, and in the EPO North of the Equator for N. Pacific albacore, striped marlin, and swordfish. For the Hawaii longline fleet, the final estimate of landed weight for each species was derived as the product of number of fish kept (logbook data) and mean whole fish weight from HDAR dealer data. The HDAR has recently improved the coverage and quality of the dealer data. Thus, we now believe these data represent nearly a complete coverage of longline landings. Landed fish are weighed to the nearest half pound. If fish were landed in processed form (e.g., gilled and gutted), conversion factors were used to estimate their whole weight. California longline data and other west coast fishery statistics were then added as needed to derive the total landings for N. Pacific albacore, swordfish, and striped marlin. Total landings were then expressed in units of metric tons. American Samoa longline landings in numbers of fish were also converted to metric tons using average size of landed fish.

Category I statistics for Hawaii fisheries are landings; no adjustment were made to account for discarded or unreported fish catch. Although longline logbooks include information on numbers of fish discarded, a procedure for estimating the average weight of discarded fish has not yet been developed. Statistics on the number of principal fish species discarded in the Hawaii longline fishery are available at http://www.pifsc.noaa.gov./fmsd/hlrep.php. With respect to under-reporting, observer data do not suggest substantial under-reporting of

commercial (landed) fish species caught by longliners.

There is some misidentification of species in the logbook data, which can result in simultaneous over- and under- reporting of similar species, and all longline logbook species data provided in this report rely solely on fishermen's identifications. As an example, nominal Hawaii longline data indicate that the annual CPUE for blue marlin in 1995 was the highest reached in recent years. However, comparisons of this CPUE statistic with concurrent HDAR landings data and data collected by observers deployed on selected Hawaii longline vessels by the NMFS Pacific Islands Regional Office (PIRO) demonstrated that it was considerably inflated by misidentification of striped marlin as blue marlin (see http://www.soest.hawaii.edu/PFRP/reprints/walsh_sdarticle.pdf). Providing feedback and training to fishermen seems to have reduced misidentification in recent years.

Catches by the Hawaii troll and handline fisheries were shown to be under-reported in the past, but improvements in the HDAR dealer data system may have greatly reduced this problem. For American Samoa fishing effort reported in logbooks is compared with data from the creel survey (http://www.wpcouncil.org/pelagic.htm) and results are used to estimate total catches for all gears. In 2005 and 2006 the adjusted creel survey indicated a total of 4,468 and 5, 147 longline sets, respectively, as compared with logbook totals of 4,359 and 5,069 sets, respectively. This indicates a very low level of possible under-reporting (about 2%).

Recreational catches are not included in the total annual catch estimates for Hawaii or the Northern Mariana Islands but are included for American Samoa and Guam, where such data are collected through surveys.

Category II: Catch and Effort (Logbook) Statistics

Two longline data sets were integrated to provide logbook statistics for 2005 and 2006, both with information on numbers of fish caught by species, effort in sets and hooks, and location. United Nations Food and Agriculture Organization 3-alpha species codes were used as species labels. The largest data set used derives from the mandatory submission of the NMFS Western Pacific Longline Fishing Log by Hawaii-based fishers. A rigorous quality control process is followed, including a quick review conducted with the provider when the logs are picked up from the vessels, later a visual inspection of the logs, and finally a computer-based error checking algorithm. The second largest data set used derives from a similar program for American Samoa-based vessel. These data are collected by NMFS field agents stationed in American Samoa and also by the American Samoa Department of Marine and Wildlife Resources in cooperation with NMFS.

All longline data sets were merged into a single logbook data set. These combined logbook data, therefore, represent all operations of the American Samoa and Hawaii-based fleets, not just operations taking place in the WCPO. The data were aggregated by year, month, and 5º longitude x 5 º latitude blocks. Confidential statistics (i.e. those from 5x5x month blocks with fewer than 3 vessels reporting) were aggregated by 6-month (semiannual) intervals into large areas of the ocean (termed "quads" in the longline data files). These areas coincide with RFMO jurisdictions and are labeled WCPFC-N (W of 150 W and N of the equator), WCPFC-S (west of 150 W and S of the equator) and IATTC-N (E of 150 W and N of

the equator). There are no US fisheries operating east of 150 W and S of the equator. The confidential statistics aggregated over 6 month periods by large areas (quads) should not be provided to third parties, as some of these summaries may still represent only 1 or 2 vessels. Data from the single longliner operating out of California in the EPO in 2005 and 2006 are not included.

Since 1995, U.S. distant-water troll vessels fishing on the high seas have been required to submit federal High Seas Compliance Act logbooks, and since 2005, all troll vessels on the U.S. West Coast have been required to submit logbooks. The catch and effort data for distant-water troll fishing were summarized for 2005 and 2006 by 1º longitude x 1º latitude x month strata in the N. Pacific and by 5º longitude x 5º latitude x month strata in the S. Pacific. To meet domestic data confidentiality requirements, a 3-boat filter was applied to each 1x1x month or 5x5x month block of summarized data, i.e., data in blocks with fewer than 3 boats fishing were excluded. A simple summary of the impacts of this filtering is included at the bottom of each worksheet of Category II troll data.

Category III: Size Composition Statistics

Size data for Hawaii longline landings (whole weight to the nearest half pound converted to kilograms) were compiled from the HDAR Commercial Marine Dealer data from vessel-trips with landing year 2006. This was done by selecting only those vessel-trips which had been identified as occurring exclusively in the WCPO on the basis of Hawaii logbook information on the locations at start of each set. When fish were landed in processed form (e.g., gilled and gutted), conversion factors were used to estimate the whole weight. Weight frequency statistics for Hawaii longline landings were compiled for albacore, bigeye tuna, yellowfin tuna, skipjack tuna, blue marlin, striped marlin and swordfish. Weight intervals used vary from 1 kg to 10 kg depending on the size range of each species. Likewise, weight frequency data for Hawaii troll and handline landings were compiled for yellowfin tuna, skipjack tuna, striped marlin, and blue marlin. Length frequency statistics for American Samoa longline landings were similarly compiled for albacore and yellowfin tuna.

Size data for all fish identified to the species level and measured by the PIRO-deployed Hawaii longline observers are provided by 5x5x month blocks for the years 2005 and 2006. Only data for blocks deemed non-confidential in the Category II data summaries are provided. The observers are trained to correctly identify fish species and measure every third fish that is brought aboard. These data indicate a greater diversity of species in catch than reported in logbooks.

Size data for the distant-water troll fishery are taken by port samplers (trained scientific technicians) as troll vessels unload in California, Washington, and Oregon ports and in Pago Pago, American Samoa. Samplers randomly select 50 to 400 fish from the top of each load. Samples are mailed or emailed to the SWFSC where they are visually edited, keyed into the system and subjected to various computer editing routines. The last one degree square and month fished by the vessel (from logbook data) is assigned to the sample by editors at the SWFSC. Samples are then simply summed by month and 1 degree square. No screening of length data for less than three vessels is applied.

Names of Data Files Provided

Category I:	Annual Catches and Vessels	CAT_ I_ WCPFC 2005-2006 ver 1.3
Category II:	Logbooks:	
	Longline	intl-llds-5deg-non-conf.csv intl-llds-5deg-conf-in-quads.cvs [encrypted]
	Distant-water Troll	CAT II_Troll_05_06
Category III:	Size Composition:	
	Hawaii Longline	HI Longline Wt-Freq 2006jaw
	Am Samoa Longline	Am Sam Longline Len-Freq 2006
	Hawaii Troll & Handline	HI Troll & Handline Wt-Freq 2006jaw
	Hawaii Longline Observer	int-lods-catch-meas-nonconf-2005mon1-6.csv int-lods-catch-meas-nonconf-2005mon7-12.csv int-lods-catch-meas-nonconf-2006mon1-6.csv int-lods-catch-meas-nonconf-2006mon7-12.csv
	Distant-water Troll	CAT_III_TROLL_2006