



Options for Complete Fishery Data Collection in the Western Pacific Region



NMFS WESTERN PACIFIC BAILY LONGLINE FISHING LOG

VESSEL: _____		PERMIT NUMBER: _____		NMFS USE ONLY	
Date of Departure from Port: ____/____/____		Port: _____		HL Trip Type: _____	
Date of Return to Port: ____/____/____		Port: _____		HL Trip No.: _____	
SET INFORMATION		Observer on Board: []			
DATE OF SET: ____/____/____		Target species: [] Tuna [] Sword [] Tuna/Sword/Other			
Number of Hooks Set: _____		Length of Mainline Set: _____ miles		Bait Type: _____	
Hooks per Float: _____		Number of Lights/Sticks: _____			
BEGIN SET Time: ____:____:____		Position: ____° ____' ____" N/S		Latitude: ____° ____' ____" E/W	
END SET Time: ____:____:____		Position: ____° ____' ____" N/S		Latitude: ____° ____' ____" E/W	
HAUL INFORMATION					
DATE OF HAUL: ____/____/____					
BEGIN HAUL Time: ____:____:____		Position: ____° ____' ____" N/S		Latitude: ____° ____' ____" E/W	
END HAUL Time: ____:____:____		Position: ____° ____' ____" N/S		Latitude: ____° ____' ____" E/W	
Number of Hooks Lost: _____		hooks			
PELAGIC SPECIES			PROTECTED SPECIES		
NUMBER OF FISH			NUMBER RELEASED		
Kept			Uninjured		
Released			Injured		
			Dead		
TUNAS:					
Albacore (finfish)			SEALS:		
Pigeye tuna			Meat Seal		
Yellowfin tuna			Sea Lions		
Skipjack tuna (also)			Other Seals		
Shoal fin tuna			DOLPHINS:		
Other tunas (specify):			Bottlenose		
			Spinner		
BILL FISH:			Other dolphins		
Blue marlin			WHALES:		
Striped marlin (mahi-mahi)			Humpback		
Sailfin			False Killer		
Spearfish (also)			Other whales		
Swordfish (broadsword)			TURTLES:		
Other marlin (specify):			Green		
			Leatherback		
OTHER PELAGICS:			Loggerhead		
Mahi-mahi			Olive ridley		
Albacore (specify)			Hawksbill		
Wahoo (also)			Unidentified hawksbill		
Oilfish (also)			BIRDS:		
Pomfret (also)			Black-foot Albatross		
Other pelagics (specify):			Laysan Albatross		
			Short-tailed Albatross		
SHARKS:			Other birds (specify):		
Blue shark					
Mako shark					
Thresher shark					
Oceanic white-tip shark					
Other shark (specify):					

I certify that the above information is complete and true to the best of my knowledge:

VESSEL CAPTAIN/OPERATOR: Print name: _____

CML: _____ Signature: _____ Date: _____

May 24, 2011

Prepared for the 107th SSC and 151st Council Meetings
June 13-18, 2011

1.0 Summary

Although much information is available on many of the fisheries under the Council's jurisdiction, detailed information on some of the other fisheries is incomplete. The Magnuson-Stevens Fishery Conservation and Management Act (MSA) defines "fishery" as (A) one or more stocks of fish which can be treated as a unit for purposes of conservation and management and which are identified on the basis of geographical, scientific, technical, recreational, and economic characteristics; and (B) any fishing for such stocks. The Council had recommended, and NMFS implemented, data collection as part of the requirement for permits for most of its fisheries in the EEZ. The data that are collected is vital for fishery scientists to develop stock assessments and provide estimates to managers to develop quotas, catch shares, or annual catch limits. The data also provides a way to monitor the fishery from year to year to ensure that current regulations are working and to see if further regulation (or relaxation of regulations) is needed. However, there remains gaps where data are either not collected or the data collection programs in place may not be sufficient.

For most areas and fisheries under the Council's jurisdiction that do not require Federal permits and reporting, a combination of creel surveys (for both commercial and non-commercial vessels), and various types of dealer reporting systems (for commercial catches only) are used to provide information to fishery managers (i.e. Guam, CNMI and American Samoa). The State of Hawaii requires reporting of fishing effort and catch by all commercial fishermen (i.e. those who sell one or more fish during the year) and collects non-commercial fishing information through the Hawaii Marine Recreational Fishery Survey (HMRFS). While these programs do collect information from fishermen, there are still some fishermen that may sell their fish and not report, or not report all of their catch for one reason or another.

The creel surveys in the region have experienced a lack of resources for conducting the survey, and as a result, managers are not confident in the data. The use of the data for stock assessment purposes is also in question, as the original purposes of the programs were not for stock assessment, but for fishery monitoring. In Hawaii, the HMRFS program is part of the larger, national Marine Recreational Fishery Statistical Survey (MRFSS), which was found to be deficient in many areas. Currently, MRFSS is being revised by the Marine Recreational Information Program (MRIP) to address these deficiencies, but MRIP has been a long and slow process. So although data are already collected, the usefulness of the data are in question, due to these deficiencies, gaps still exist in the knowledge of these fisheries.

Individually, these gaps can be addressed through increased funding and resources, but the economic situation in the United States makes this unlikely. These economic conditions may also affect the ability of NMFS and other agencies to implement new, or revise current, data collection programs. Voluntary surveys in the Western Pacific Region (WPR) (i.e. creel surveys) have already been used to develop stock assessments for bottomfish, but these have been developed using other data programs such as commercial invoices and market surveys, and still managers and scientists are not confident with its outcome. As with the Main Hawaiian Islands deep-seven bottomfish stock assessment, the models will need to be continually revised to increase the confidence in the results by adding new information collected through new

programs and initiatives. The costs of improving these surveys, as well as HMRFS, need to be weighed against the potential outcomes to determine if the desired end product, a stock assessment usable for creating Annual Catch Limits (ACLs), can be developed more cost effectively than by other methods.

Another approach may be to consolidate the reporting requirements already in place to produce an efficient permitting and reporting process that covers all fisheries in the EEZ of the Western Pacific region. Reporting requirements for all Federal MUS, regardless of it being commercial or recreational, throughout the region, would indicate who fished, where they fished, what they fished for (and caught), and their fishing effort or any other information needed (e.g. protected species interactions). It would be expected that if fishermen were required to report their catch, all fishermen would report all of their catch, but, as seen with other laws, there will be those that do not follow the laws. This being the case, increased enforcement costs would be needed to ensure that fishermen are in compliance with reporting regulations. These options would collect data from all of the fisheries where data may not be collected currently (commercial, non-commercial, subsistence) or where data are collected but managers and scientists don't have confidence in the results.

Collecting complete data from the fisheries in the WPR has even greater importance today, as the deadlines for mandates such as ACLs begin to lapse. A range of options is explored in this document (Table 1) for the Council to consider.

Table 1: Summary of Options

Option	Description
1	No Action -Continue to collect data under existing programs.
2	Develop Federal <u>Permits</u> and Catch Report for Each Existing Fishery Not Currently Federally Permitted - Require Federal permits and catch reports for all fisheries not currently permitted under Federal law.
3	Develop Federal <u>Surveys</u> for Each Existing Fishery Not Currently Federally Permitted - NMFS to develop voluntary surveys to collect fishing catch and effort information from all fisheries not currently permitted under Federal law.
4	Comprehensive Western Pacific Fishing Permits and Catch Reports - Require Federal Permits and catch reports for all harvest of Federal MUS <u>in Federal waters only</u> .
5	Comprehensive Western Pacific Fishing Permits and Catch Reports - Require Federal Permits and catch reports for all harvest of Federal MUS in <u>both local and Federal waters</u> .

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List of Acronyms

ABC	Allowable Biological Catch
ACL	Annual Catch Limit
ACT	Annual Catch Target
CHCRT	Currently Harvested Coral Reef Taxa
CNMI	Commonwealth of the Northern Mariana Islands
DAR	Hawaii Division of Aquatic Resources
DAWR	Guam Division of Aquatic and Wildlife Resources
DFW	CNMI Division of Fish and Wildlife
DMWR	American Samoa Department of Marine and Wildlife Resources
EEZ	Exclusive Economic Zone
FFA	Forum Fisheries Agency

FMP	Fishery Management Plan
FEP	Fishery Ecosystem Plan
HMRFS	Hawaii Marine Recreational Fishery Survey
MRFS	Marine Recreational Fishery Statistical Survey
MRIP	Marine Recreational Information Plan
MSA	Magnuson-Stevens Fishery Conservation and Management Act
MUS	Management Unit Species
NOAA	National Oceanic and Atmospheric Administration
NMFS	National Marine Fisheries Service
PHCRT	Potentially Harvested Coral Reef Taxa
PRIA	Pacific Remote Island Areas
WPacFIN	Western Pacific Fishery Information Network
WPRFMC or Council	Western Pacific Regional Fishery Management Council

2.0 Introduction

The issue of addressing gaps in fishery data collection has been around since the creation of the Western Pacific Regional Fishery Management Council (Council) in 1976 and its associated Fishery Management Plans (FMPs). The Council has continually struggled with addressing these gaps because of a shortage of resources and regional differences. In the Western Pacific Region, there are voluntary creel surveys for American Samoa, Guam and CNMI operated by the local agencies with assistance from the Western Pacific Fisheries Information Network (WPacFIN) with some Federal permits for longlining and bottomfish fishing, and commercial data collection through the markets and fish processors. In Hawaii, there is a mandatory Commercial Marine License (CML) for all of Hawaii's commercial fisheries and a voluntary recreational fishery survey. The differences in the types of data collected and the degree to which the information is provided (voluntary vs mandatory) in the WPR has made it difficult for stock assessments to be developed. In 2002, the Council, at its 122nd Meeting, was presented with options to address the data needs in the region. At that time, the Council decided to let each island area address its own needs in its own matter. In Guam, the Guam Fishermen's Cooperative Association, in conjunction with NOAA Fisheries, the Guam Department of Agriculture and Wildlife Resources, and the Council, developed a voluntary fishermen's survey to capture fishery data; In Hawaii, the Hawaii Marine Recreational Fishery Survey (HMRFS), an offshoot of the NOAA Fisheries Marine Recreational Fisheries Statistical Survey, was re-initiated to capture recreational fishery data; and American Samoa and the Commonwealth of the Northern Mariana Islands (CNMI) continued to rely on their creel surveys administered by WPacFIN.

As recent as its 95th meeting in June 2007, the Council's Scientific and Statistical Committee (SSC) has noted that adequate reporting of catch data are required for management decisions (ACLs, TACs, Quotas, Stock Assessments, etc.). The SSC has also recommended that fish catch be reported in the interest of gaining complete scientific information.

On July 31, 2007, Council staff met with NOAA Fisheries representatives to discuss the needs and issues facing the Western Pacific region's fisheries. At this meeting, NOAA stated that the Council should recommend reporting requirements for all harvests of federally managed species whether they are caught in State or Federal waters with the reason that it will provide comprehensive information regarding catches of these species.

The Council, at its 146th Meeting in October 2009, recommended NMFS, State, and Territory fishery agencies continue to revise existing programs to fill data gaps. In a subsequent Data Workshop held at the Council Office in November 2009, many gaps in the data collection programs were identified, particularly the usefulness of the data for new mandates such as Annual Catch Limits (ACLs) and catch shares.

The requirement for the Council to set ACLs in 2011 has brought about a renewed interest in capturing complete data for the purpose of setting appropriate Allowable Biological Catch by the Council's SSC and subsequent ACLs and/or Annual Catch Targets (ACTs) for each Management Unit Species (MUS) under Federal Management.

3.0 Purpose and Need for Action

The Council has authority over the fisheries in the US Exclusive Economic Zone (EEZ) around the State of Hawaii, the Territory of American Samoa, the Territory of Guam, the Commonwealth of the Northern Mariana Islands, and the U.S. Pacific Remote Island Areas (PRIA) of the Western Pacific Region. The Council provides management recommendations based upon the Fishery Ecosystem Plans (FEPs) implemented by the National Marine Fisheries Service (NMFS). The FEPs contain MUS that should be properly monitored to ensure the sustainability of the fishery.

Although much information is available on major fisheries under the Council's jurisdiction, detailed information on some smaller fisheries is incomplete. For most areas and fisheries under the Council's jurisdiction, a combination of creel surveys (for both commercial and recreational vessels), and various types of dealer reporting systems (for commercial catches only) are used to provide information to fishery managers. In Hawaii, recreational fisheries data are collected through HMRFS and the State requires reporting of fishing effort and catch by all commercial fishermen (i.e. those who sell one or more fish during the year). For most of the island areas, recreational fisheries data are available (Appendix A), however, some of the data are suspect (i.e. HMRFS) and much of the data comes from voluntary surveys.

All of these data collection programs provide basic information used in stock assessments and management decisions. However, there are many gaps in these programs where data are not collected such as the non-commercial sector of the bottomfish and pelagic fisheries using HMRFS in Hawaii and creel surveys in American Samoa, Guam, and CNMI. These data gaps include missing information from recreational (i.e. those who fish for sport or pleasure), subsistence (i.e. those who fish for food), and expense (i.e. those who sell fish only to recover their trip expenses) fishermen and it is anticipated that they do not provide the detailed biological, economic, and social information needed to ensure fully informed management decisions. The Hawaii recreational fishery data gap is being addressed through a new Marine Recreational Information Program (MRIP) initiative which would register Federal fishermen and improve the HMRFS survey. This data gap will not be completely filled however, as this program will mainly address EEZ fishing.

Individually, these gaps can be addressed through increased funding and resources. A better approach may be to have a single reporting requirement for all fishing of Federal MUS throughout the region that indicates who fished, where they fished, what they fished for (and caught), and their fishing effort or any other information needed.

In addition to filling data gaps, recent MSA mandates such as ACLs and the national initiative towards management by catch shares, has increased the need for complete catch data, particularly the missing data from recreational fisheries. Currently, ACLs (and potential catch shares) will be based on data in which there is little confidence and may not provide accurate estimates for sustainable fishing and/or the growth/development of fisheries in the WPR. These ACLs will also require information be provided on the catch and effort to ensure that they are not being exceeded and that Accountability Measures (AM) are properly instituted as needed.

The purpose of this options paper is to collect complete and accurate fishery data through the requirement of mandatory fishery reporting or the development of additional voluntary surveys to assist the Council in making management decisions and developing ACLs. When fisheries managers don't have complete data the fishery will be managed on the data that is available. This can result in overly restrictive management which is wasteful, or it can result in overfishing and declining catches. In either case, fishermen are the losers. It is in the long-term interest of all of the residents of the Western Pacific Region to have complete reports on fishery harvest so that the best data possible is being used to manage our valuable fisheries. These options will provide the information on fisheries in the WPR to develop accurate stock assessments that scientists and managers are confident in to be used for the development of accurate ACLs.

4.0 Objective

The objective of this options paper is to achieve complete and accurate fishery data collection for the purpose of improved fishery management through the development of accurate stock assessments and accurate ACLs.

5.0 Description of Options

The following options are proposed for consideration to achieve the objective:

5.1 Option 1: No Action

Under this option, the Council and NMFS would continue to collect data and information utilizing existing data collection and monitoring programs. Recreational data will be collected through the NMFS WPacFIN creel surveys in American Samoa, Guam and CNMI, while Hawaii will continue to be subject to the HMRFS and MRFSS programs.

5.2 Option 2: Develop Federal Permits and Catch Report for Each Existing Fishery Not Currently Federally Permitted

Under Option 2, Federal permits and catch reports would be required for all fisheries not currently permitted under Federal law. This includes non-longline pelagic and coral reef CHCRT harvest in the region, as well as bottomfish harvest in American Samoa, non-commercial bottomfish harvest in CNMI, and bottomfish harvest by vessels under 50' in Guam.

5.3 Option 3: Develop Federal Surveys to Collect Data from Each Existing Fishery Not Currently Federally Permitted.

Under this option, NMFS would develop voluntary surveys to collect fishing catch and effort information from all fisheries not currently permitted under Federal law. This includes non-longline pelagic and coral reef CHCRT harvest in the region, as well as bottomfish harvest in American Samoa, non-commercial bottomfish harvest in CNMI, and bottomfish harvest by vessels under 50' in Guam.

The survey may be implemented through an angler intercepts, mail, catch card/drop boxes, internet, or other means.

5.4 Option 4: Comprehensive Western Pacific Fishing Permits and Catch Reports

This option would require Federal Permits and catch reports for all harvest of Federal MUS in Federal waters only.

Under this option, existing Federal permits and reporting would be consolidated into one permit for harvest of Federal MUS with requirements to report catch regardless in the EEZ only.

5.5 Option 5: Comprehensive Western Pacific Fishing Permits and Fishing Catch Reports- Require Federal permits and catch reports for all fishing of Federal Management Unit Species in both local and Federal waters.

Under this option, existing Federal permits and reporting would be consolidated into one permit for harvest of Federal MUS with requirements to report all catch regardless of where it was caught (EEZ or State/Territorial waters).

6.0 Data Collection Programs in the Western Pacific Region

Table 2 illustrates the data collection systems in place for fisheries based in the western Pacific region. Fisheries that do not require Federal permits or data collection are presented in bold.

Table 2: Federal Permitting and Reporting Requirements for Fishermen by Island Area Fishery

Area and MUS by Fishery	Federal permit required for fishing in EEZ?	Federal logbook required for fishing in EEZ?	License or Reporting Required in Local Jurisdiction?
American Samoa			
Bottomfish MUS	No	No	No; Voluntary through creel and other surveys
Coral Reef MUS	<i>PHCRT-Yes</i> CHCRT-No	<i>PHCRT-Yes</i> CHCRT-No	No; Voluntary through creel and other surveys
Crustaceans MUS	Yes	Yes	No; Voluntary through creel and other surveys
Precious Corals MUS	Yes	Yes	No; Voluntary through creel and other surveys
Pelagic MUS	<i>Longline-Yes</i> Others-No	<i>Longline-Yes</i> Others-No	No; Voluntary through creel and other surveys
CNMI			
Bottomfish MUS	<i>Commercial-Yes</i> Non-comm-No	<i>Commercial-Yes</i> Non-comm-No	No; Voluntary through creel and other surveys
Coral Reef MUS	<i>PHCRT-Yes</i> CHCRT-No	<i>PHCRT-Yes</i> CHCRT-No	No; Voluntary through creel and other surveys

Area and MUS by Fishery	Federal permit required for fishing in EEZ?	Federal logbook required for fishing in EEZ?	License or Reporting Required in Local Jurisdiction?
Crustaceans MUS	Yes	Yes	No; Voluntary through creel and other surveys
Precious corals MUS	Yes	Yes	No; Voluntary through creel and other surveys
Pelagic MUS	<i>Longline-Yes Others-No</i>	<i>Longline-Yes Others-No</i>	No; Voluntary through creel and other surveys
Guam			
Bottomfish MUS	<i>Over 50'-Yes Others-No</i>	<i>Over 50'-Yes Others-No</i>	No; Voluntary through creel and other surveys
Coral Reef MUS	<i>PHCRT-Yes CHCRT-No</i>	<i>PHCRT-Yes CHCRT-No</i>	No; Voluntary through creel and other surveys
Crustaceans MUS	Yes	Yes	No; Voluntary through creel and other surveys
Precious corals MUS	Yes	Yes	No; Voluntary through creel and other surveys
Pelagic MUS	<i>Longline-Yes Others-No</i>	<i>Longline-Yes Others-No</i>	No; Voluntary through creel and other surveys
Hawaii			
Bottomfish MUS	<i>Commercial-No Non-Commercial-Yes</i>	<i>NWHI-No All others-Yes</i>	<i>NWHI-Yes Commercial-Yes Non-comm-No</i>
Coral Reef MUS	<i>PHCRT-Yes CHCRT-No</i>	<i>PHCRT-Yes CHCRT-No</i>	<i>Commercial-Yes Recreational- some through HMRFS</i>
Crustaceans MUS	Yes	Yes	<i>Commercial-Yes Recreational- some through HMRFS</i>
Precious Corals MUS	Yes	Yes	<i>Commercial-Yes Recreational-</i>

Area and MUS by Fishery	Federal permit required for fishing in EEZ?	Federal logbook required for fishing in EEZ?	License or Reporting Required in Local Jurisdiction?
			some through HMRFS
Pelagic MUS	<i>Longline-Yes</i> <i>Others-No</i>	<i>Longline-Yes</i> <i>Others-No</i>	<i>Commercial-Yes</i> <i>Recreational-</i> some through HMRFS
PRIA			
Bottomfish MUS	Yes	Yes	No
Coral Reef MUS	<i>PHCRT-Yes</i> <i>CHCRT-Yes in low use MPAs only</i>	<i>PHCRT-Yes</i> <i>CHCRT-Yes in low use MPAs only</i>	No
Crustaceans MUS	Yes	Yes	No
Precious Corals MUS	Yes	Yes	No
Pelagic MUS	Yes	Yes	No

From Table 2, the data not being collected by the Federal government includes all coral reef CHCRT, all non-longline pelagic, American Samoa bottomfish, and CNMI non-commercial bottomfish. Some of this data may be collected by existing creel surveys in the region (American Samoa bottomfish, CNMI non-commercial bottomfish, CHCRT, non-longline pelagic) and through HMRFS in the State of Hawaii (some CHCRT, non-longline pelagic) and other voluntary reporting such as those in Table 3.

Table 3 lists the methods of data collection for each type of fishery in each of the island areas. These methods include mandatory logbooks, voluntary creel surveys, permits, and secondary data collection systems.

Table 3: Current Data Collection Methods in Each Island Area

Area	Type of Fishery	Methods of Data Collection
Hawaii	Commercial	Federal logbooks, Federal Observers, HI dealer report, Federal Permit File, HI License File, HI Catch Report, Federal Sales Report
	Recreational	Federal Logbook (BF Non-commercial), MRFSS/HMRFS

Area	Type of Fishery	Methods of Data Collection
American Samoa	Commercial	Cannery Summaries, Federal Permit File, Federal Logbook, DMWR Commercial Purchase System, Daily Effort Census, Cannery Sampling Data, Offshore Creel Survey, Inshore Creel Survey
	Recreational	Offshore Creel Survey, Inshore Creel Survey
Guam	Commercial	Transshipment Files, Offshore Creel Survey, Commercial Landings System, Inshore Creel Survey, Guam Voluntary Data Collection Program
	Recreational	Offshore Creel Survey, Inshore Creel Survey, Guam Voluntary Data Collection Program
CNMI	Commercial	Offshore Creel Survey, DFW Commercial Purchase Invoices, DFW License File, CNMI Registration File, DFW Logbook, Dockside Sampling
	Recreational	Offshore Creel Survey
PRIAs	Commercial	Federal Longline Logbook, Federal Observers, State Catch Reports, Federal Troll/Handline Logbooks (pending)
	Recreational	USFWS Catch Reports, Midway Sportfishing Boat Trip Log
High Seas	Commercial	Federal High Seas Logbooks, FFA Logsheet, FFA Observers, Federal Port Samplers, Federal Local Logbook
	Recreational	NA

7.0 Impacts of the Options on the Affected Environment

This section describes impacts to the proposed options.

7.1 Option 1: No Action

Under this option, the Council and NMFS would continue to collect data and information utilizing existing data collection and monitoring programs. Recreational data will be collected

through the NMFS WPacFIN creel surveys in American Samoa, Guam and CNMI, while Hawaii will continue to be surveyed using the HMRFS and MRFSS programs.

Target/Non-target Species

The no action option would result in the Council continuing to manage species using data that may not be complete due to the lack of recreational or other fishery sector data that does not have a permitting or reporting requirement.

Protected Species

Protected species interactions would continue to be monitored by existing data collection and observer programs. Those fisheries where data are not currently being collected, may miss interactions with protected species.

Fishery Participation and Communities

There would be no impact to fishery participation and communities as a result of this option. However, if data are not collected and a fishery isn't monitored, stricter regulations (e.g. area closures, seasonal closures, quotas, limited entry, etc.) may impact fisher participation and communities in the future.

Administration and Enforcement

No additional administration or enforcement would be needed under this option.

7.2 Option 2: Develop Federal Permits and Catch Report for Each Existing Fishery Not Currently Federally Permitted

Under Option 2, Federal permits and catch reports would be required for all fisheries not currently permitted under Federal law. This includes non-longline pelagic and coral reef CHCRT harvest in the region, as well as bottomfish harvest in American Samoa, non-commercial bottomfish harvest in CNMI, and bottomfish harvest by vessels under 50' in Guam.

Target/Non-target Species

Requiring Federal permits and catch reporting for fisheries not already covered by existing data collection programs would allow for better management through better data for stock assessments and management decisions. Region-wide reporting for fisheries not currently captured under existing programs would allow for the collection of more complete data and more complete management decisions.

As noted in section 6, the main Federal permits and associated catch reporting forms that would be implemented would be for the small-boat pelagic fishery (i.e. trolling and handlines) as well as for the coral reef ecosystem MUS. Many of the pelagic species are highly migratory and are dependent upon international management measures, but recent research on yellowfin tuna may show that this pelagic species has a definitive home range. The coral reef ecosystem MUS are mainly found in local, state/territorial waters, but some of the species under the CHCRT are found in some parts of the EEZ.

Protected Species

Protection species interactions could be captured through reporting for the entire Western Pacific fisheries and could also continue to be monitored with current observer programs.

Fishery Participation and Communities

This option would only affect those participants that participate in fisheries that do not have existing data collection programs (see Table 2). People of the Western Pacific could continue to participate in fishing and the data monitoring would contribute to the better management of the fishery for the future. A large burden would be placed on all participants in a fishery that does not currently have a data collection program in place. These participants would need to attain, complete, and submit a fish catch report. Many of these participants have never applied for permits and have never been required to fill-out catch reports or logbooks. Although literacy rates in the island areas are over 90%, many of the subsistence fishing communities may not be as literate and not have the ability to properly fill out catch reports or even apply for a permit. Increased data collection could be used for localized management of fishery resources for communities.

Administration and Enforcement

The creation of more catch reports would require a large amount of administration. The NMFS would be tasked with providing catch reports to every angler in the Western Pacific region that fishes in the EEZ and is not currently captured under current data collection and monitoring programs. The NMFS would also be tasked with receiving the catch reports and storing the data.

It would be expected that if fishermen were required to report their catch, all fishermen would report all of their catch, but, as seen with other laws, there will be those that do not follow the laws. This being the case, increased enforcement costs would be needed to ensure that fishermen are in compliance with reporting regulations. Enforcement would be handled by NMFS Office for Law Enforcement on land and the US Coast Guard in the EEZ. A catch report would be needed by any fisherman taking Federal MUS in Federal or local waters that is not covered by existing data collection and monitoring programs. This option removes the confusion of EEZ vs State/Territorial water landings because all species in the Western Pacific region are Federal MUS under the Council's FMPs.

Under this option, new catch reports systems would need to be developed for those fisheries in which data are not currently collected. There would be no overlaps or duplicative catch reports.

7.3 Option 3: Develop Federal Surveys to Collect Data from Each Existing Fishery Not Currently Federally Permitted.

Under this option, NMFS would develop voluntary surveys to collect fishing catch and effort information from all fisheries not currently permitted under Federal law. This includes non-longline pelagic and coral reef CHCRT harvest in the region, as well as bottomfish harvest in American Samoa, non-commercial bottomfish harvest in CNMI, and bottomfish harvest by vessels under 50' in Guam.

Target/Non-target Species

Voluntary surveys for fisheries not already covered by existing data collection programs would allow for better management through better data for stock assessments and management decisions. Additional information will provide a better picture of the fishery participants, catch and effort, and monitoring.

Protected Species

Protection species interactions could be captured through any survey developed for these fisheries and would also continue to be monitored with current observer programs. However, the likelihood of fishery participants providing accurate information on protected species interactions may be low due to participants not wanting to incriminate themselves.

Fishery Participation and Communities

This option would only affect those participants that participate in fisheries that do not have existing data collection programs (see Table 2). People of the Western Pacific could continue to participate in fishing and the data monitoring would contribute to the better management of the fishery for the future. There would be less of a burden placed on fisheries participants and communities as these surveys would be voluntary.

Administration and Enforcement

The creation of surveys would require a large amount of administration and implementation. The NMFS would be tasked with surveying every angler in the Western Pacific region that fishes in the EEZ and is not currently captured under current data collection and monitoring programs. The NMFS would also be tasked with analysis and expansion of the survey as well as storing the data and developing catch estimates/reports.

Implementation of the survey may prove difficult in determining who would be targeted as many of the fisheries in the Western Pacific utilize multiple gears and target multiple species. No additional burden would be placed upon the enforcement agencies as surveys are by nature, voluntary.

7.4 Option 4: EEZ Comprehensive Western Pacific Fishing Permits and Catch Reports

This option would require Federal Permits and catch reports for all harvest of Federal MUS in Federal waters only.

Target/Non-target Species

A mandatory reporting requirement for all Federal MUS would allow for better management through better data for stock assessments and management decisions. Requiring reporting throughout the region would allow for the collection complete data and more complete management decisions. The data collected would not be confined to political boundaries and would allow stocks to be managed throughout their range through combined Federal and local efforts.

Protected Species

Protection species interactions would be captured through catch reports for the entire Western Pacific fisheries and would also continue to be monitored with current observer programs.

Fishery Participation and Communities

Under this option, people of the Western Pacific could continue to participate in fishing and the data monitoring would contribute to the better management of the fishery for the future. A burden would be placed on all Western Pacific region fishery participants, in having to attain, complete, and submit fishing catch reports. Increased data could be used for localized management of fishery resources for communities.

Administration and Enforcement

The creation of a Western Pacific catch report would require a large amount of administration. The NMFS would be tasked with providing catch reports to every angler that fishes in both Federal and local waters of the Western Pacific region. The NMFS would also be tasked with receiving the catch reports and storing the data.

A comprehensive fish catch report in the Western Pacific region would also be duplicative in some fisheries that already have local or Federal reports (i.e. Hawaii commercial fishery, American Samoa longline, Hawaii longline, Federal precious corals and crustaceans). These existing reports would need to either be removed or consolidated into the comprehensive catch report system.

Enforcement would be handled by NMFS Office for Law Enforcement on land and the US Coast Guard in the EEZ. This option removes the confusion of EEZ vs local water landings because virtually all species in the Western Pacific region are Federal MUS.

Catch reports without a permitting system in place may be a burden because it would be difficult to monitor and enforce without knowing who should be turning in a catch report.

7.5 Option 5: Comprehensive Western Pacific Fishing Permits and Fishing Catch Reports in local and Federal waters

This option would require Federal permits and catch reports for all fishing of Federal Management Unit Species in both local and Federal waters.

Target/Non-target Species

A mandatory permit and reporting requirement for Federal MUS would allow for better management through better data for stock assessments and management decisions. Requiring reporting throughout the region would allow for the collection of more complete data and more complete management decisions. The data collected may be confined to Federal jurisdiction only and not take into account the full range of a given species. The data collected would not be confined to political boundaries and would allow stocks to be managed throughout its range.

Protected Species

Protection species interactions would be captured through permits and reporting for fisheries in the EEZ of the Western Pacific and could also continue to be monitored with current observer programs.

Fishery Participation and Communities

Under this option, people of the Western Pacific could continue to participate in fishing and the data monitoring would contribute to the better management of the fishery for the future. Increased data collection could be used for localized management of fishery resources for communities. Similar to options 2 and 4, a burden would be placed on fishery participants, in having to attain, complete, and submit a fishing catch report and permit application. Also similar to option 4, fishery participants would need to attain a Federal fishing permit. However, under option 5, a permit would be needed for those participants fishing for Federal MUS in both local and Federal waters.

Administration and Enforcement

The creation of a Western Pacific fishing permit and catch report would require a large amount of administration. The NMFS PIRO permitting division would be tasked with providing permits to every angler in the Western Pacific region that fishes in the EEZ. The NMFS PIFSC would be tasked with receiving the catch reports at storing the data. In both offices, the numbers of permits and reports would be very large. The creation of a Western Pacific permit for the entire region would also likely entail removing permitting systems already in place.

In option 5, a permitting system would allow the NMFS and enforcement agencies to define the known universe of fishermen and to know who would be required to file a catch report. A Federal fishing permit for all participants fishing for Federal MUS would expand the known universe to all fishermen since virtually all of fisheries in the Western Pacific are Federal MUS fisheries. Under options 2 and 3, this universe of fishermen is unknown. Under option 4, this universe is confined to only boat-based fishermen in Federal waters.

A comprehensive fish catch report in the Western Pacific region would also be duplicative in some fisheries that already have local or Federal reports (i.e. Hawaii commercial fishery, American Samoa longline, Hawaii longline, Federal precious corals and crustaceans). These existing reports would need to either be removed or consolidated into the comprehensive catch report system. National Standard 7 was established to minimize costs and avoid unnecessary duplication, and has been handled in Hawaii by providing for commercial fisheries data collection in Federal waters (with the exception of longlining) to be substituted with State of Hawaii CML requirements. In other island areas, Federal permits were established for fisheries such as bottomfishing, even though creel surveys exist in these areas. The reason for this was that data wasn't being captured due to the landings being done during times where surveyors were not working. These "rare event" type of fisheries cause the data reports to show a fishery based on expansions of limited data.

Enforcement would be handled by NMFS Office for Law Enforcement on land and the US Coast Guard in the EEZ. A permit and catch report would be needed by every fisherman in the Western Pacific. There could be less confusion during dockside inspections because it wouldn't matter if the fish was caught in the EEZ or State/Territorial waters.

Table 4: Impacts of Options by Island Area

Island Area	Fisheries Affected	Option	Is data being collected from other programs?	Costs to Administer	Cost to Participants
American Samoa	ALL	No Action	Data collected through existing creel surveys for all affected fisheries	None to administer, but may include costs for upgrading current programs and enforcing current regulations for reporting	None
	Bottomfish, Non-longline Pelagic, Coral Reef CHCRT	Federal Permits	Data collected through existing creel surveys for all affected fisheries	Costs for developing and administering permits, developing and collecting logbooks, enforcing permits and logbook submission	Participants need to apply for (pay a fee) and receive a federal permit; Also need to fill out logbook and provide to NMFS monthly
	Bottomfish, Non-longline Pelagic, Coral Reef CHCRT	Federal Surveys	Data collected through existing creel surveys for all affected fisheries	Costs for developing and administering survey	None; Surveys are voluntary
	ALL	EEZ Permit and Reports	Data collected through existing creel surveys for all affected fisheries	Costs for developing and administering permits, developing and collecting logbooks, enforcing permits and logbook submission	Participants need to apply for (pay a fee) and receive a federal permit; Also need to fill out logbook and provide to NMFS monthly
	ALL	Comprehensive Permit and Reports	Data collected through existing creel surveys for all affected fisheries	Costs for developing and administering permits, developing and collecting logbooks, enforcing permits and logbook submission	Participants need to apply for (pay a fee) and receive a federal permit; Also need to fill out logbook and provide to NMFS monthly
	ALL	No Action	Data collected through existing creel surveys for all affected fisheries	None to administer, but may include costs for upgrading current programs and enforcing current regulations for reporting	None
Guam	Bottomfish Vessels under 50 feet, Non-longline Pelagic, Coral Reef CHCRT	Federal Permits	Data collected through existing creel surveys for all affected fisheries	Costs for developing and administering permits, developing and collecting logbooks, enforcing permits and logbook submission	Participants need to apply for (pay a fee) and receive a federal permit; Also need to fill out logbook and provide to NMFS monthly

Island Area	Fisheries Affected	Option	Is data being collected from other programs?	Costs to Administer	Cost to Participants
CNMI	Bottomfish Vessels under 50 feet, Non-longline Pelagic, Coral Reef CHCRT	Federal Surveys	Data collected through existing creel surveys for all affected fisheries	Costs for developing and administering survey	None; Surveys are voluntary
	ALL	EEZ Permit and Reports	Data collected through existing creel surveys for all affected fisheries	Costs for developing and administering permits, developing and collecting logbooks, enforcing permits and logbook submission	Participants need to apply for (pay a fee) and receive a federal permit; Also need to fill out logbook and provide to NMFS monthly
	ALL	Comprehensive Permit and Reports	Data collected through existing creel surveys for all affected fisheries	Costs for developing and administering permits, developing and collecting logbooks, enforcing permits and logbook submission	Participants need to apply for (pay a fee) and receive a federal permit; Also need to fill out logbook and provide to NMFS monthly
	ALL	No Action	Data collected through existing creel surveys for all affected fisheries	None to administer, but may include costs for upgrading current programs and enforcing current regulations for reporting	None
	Non-commercial Bottomfish, Non-longline Pelagic, Coral Reef CHCRT	Federal Permits	Data collected through existing creel surveys for all affected fisheries	Costs for developing and administering permits, developing and collecting logbooks, enforcing permits and logbook submission	Participants need to apply for (pay a fee) and receive a federal permit; Also need to fill out logbook and provide to NMFS monthly
	Non-commercial Bottomfish, Non-longline Pelagic, Coral Reef CHCRT	Federal Surveys	Data collected through existing creel surveys for all affected fisheries	Costs for developing and administering survey	None; Surveys are voluntary
	ALL	EEZ Permit and Reports	Data collected through existing creel surveys for all affected fisheries	Costs for developing and administering permits, developing and collecting logbooks, enforcing permits and logbook submission	Participants need to apply for (pay a fee) and receive a federal permit; Also need to fill out logbook and provide to NMFS monthly

Island Area	Fisheries Affected	Option	Is data being collected from other programs?	Costs to Administer	Cost to Participants
	ALL	Comprehensive Permit and Reports	Data collected through existing creel surveys for all affected fisheries	Costs for developing and administering permits, developing and collecting logbooks, enforcing permits and logbook submission	Participants need to apply for (pay a fee) and receive a federal permit; Also need to fill out logbook and provide to NMFS monthly
Hawaii	ALL	No Action	Data collected through existing state of Hawaii CML, Federal permits and HMRFS for all affected fisheries	None to administer, but may include costs for upgrading current programs and enforcing current regulations for reporting	None
	Commercial Bottomfish, Non-longline Pelagic, Coral Reef CHCRT	Federal Permits	Data collected through existing state of Hawaii CML for commercial non-pelagic longline, bottomfish and coral reef, and HMRFS for non-commercial non-longline pelagic and coral reef,	Costs for developing and administering permits, developing and collecting logbooks, enforcing permits and logbook submission	Participants need to apply for (pay a fee) and receive a federal permit; Also need to fill out logbook and provide to NMFS monthly
	Commercial Bottomfish, Non-longline Pelagic, Coral Reef CHCRT	Federal Surveys	Data collected through existing state of Hawaii CML for commercial non-pelagic longline, bottomfish and coral reef, and HMRFS for non-commercial non-longline pelagic and coral reef,	Costs for developing and administering survey	None; Surveys are voluntary
	ALL	EEZ Permit and Reports	Data collected through existing state of Hawaii CML, Federal permits and HMRFS for all affected fisheries	Costs for developing and administering permits, developing and collecting logbooks, enforcing permits and logbook submission	Participants need to apply for (pay a fee) and receive a federal permit; Also need to fill out logbook and provide to NMFS monthly
	ALL	Comprehensive Permit and Reports	Data collected through existing state of Hawaii CML, Federal permits and HMRFS for all affected fisheries	Costs for developing and administering permits, developing and collecting logbooks, enforcing permits and logbook submission	Participants need to apply for (pay a fee) and receive a federal permit; Also need to fill out logbook and provide to NMFS monthly

Appendix A: Marine Recreational Fisheries of the Western Pacific Region

(From 2009 Pelagics Annual Report)

Introduction

Fishing, either for subsistence or recreation continues to be an extremely important activity throughout the Western Pacific Region in the four major populated island areas of the Western Pacific Region, Hawaii, American Samoa, Guam and the Commonwealth of the Northern Mariana Islands (CNMI). Fish consumption in Micronesia and Polynesia typically averages about 130 lb/per capita/yr (Dalzell et al 1996) and even in more culturally diverse Hawaii, fish consumption is almost three times the US national average at about 42 lb/person/yr (Dalzell & Paty 1996).

Recreational fisheries in the Western Pacific Region

In Hawaii, recreational shoreline fishing was more popular than boat fishing up to and after WW II. Boat fishing during this period referred primarily to fishing from traditional canoes (Glazier 1999). All fishing was greatly constrained during WW II through time and area restrictions, which effectively stopped commercial fishing and confined recreational fishing to inshore areas (Brock 1947). Following WWII, the advent of better fishing equipment and new small boat hulls and marine inboard and outboard engines led to a growth in small vessel-based recreational fishing.

A major period of expansion of small vessel recreational fishing occurred between the late 1950s and early 1970s, through the introduction of fiberglass technology to Hawaii and the further refinement of marine inboard and outboard engines (Figure 1). By the early 1960s there were an estimated 5,300 small boats in the territory being used for recreational fishing. By the 1980s the number of recreational or pleasure craft had risen to almost 13,000 vessels and to about 15,000 vessels in the 1990s. There are presently some 26 fishing clubs in Hawaii, and a variety of different recreational fishing tournaments organized both by clubs and independent tournament organizers. Hawaii also hosts between 150 to 200 boat based fishing tournaments, about 30 of which are considered major competitions, with over 20 boats and entry fees of \geq \$100. This level of interest in recreational fishing is sufficient to support a local fishing magazine, Hawaii Fishing News, which besides articles of interest to recreational fishermen, includes a monthly roundup of the fishing activity and conditions at the major small boat harbors in the State. Further, a directory of the State's small boat harbors and launching ramps is published annually by Hawaii Ocean Industry and Shipping news (see December 2002/January 2003 issue).

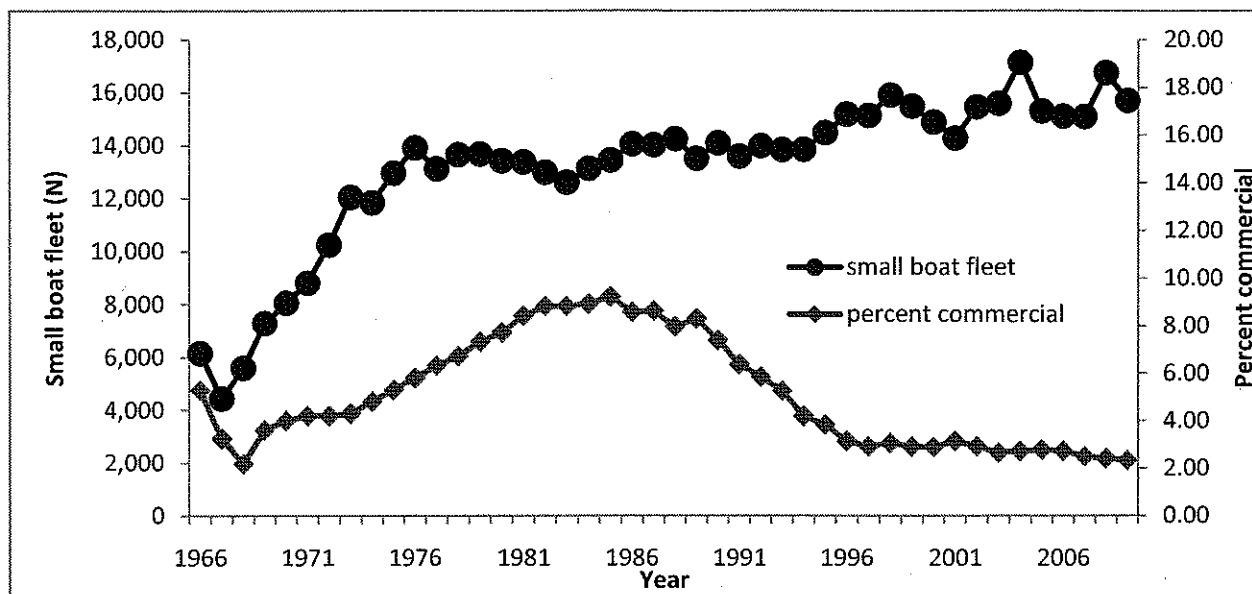


Figure 1 Annual number of small vessel fleet registrations in Hawaii, 1966-2009. Figure shows total fleet size, and percentage of vessels being registered for commercial fishing (Source: Hawaii Division of Boating and Ocean Resources)

Elsewhere in the region, recreational fishing is less structured. In Guam fishing clubs have been founded along ethnic lines by Japanese and Korean residents. These clubs had memberships of 10-15 people, along with their families. Four such clubs were founded in Guam during the past 20 years, but none lasted for more than a 2-3 years (Gerry Davis, Guam DAWR pers. comm.). There was also a Guam Boating Association comprising mostly fishermen, with several hundred members. This organization functioned as a fishing club for about 10 years and then disbanded. Some school groups and the boy scouts have formed fishing clubs focused on rod and reel fishing, and there is still one spear-fishing club that has only a handful of members, but appears to be still be active. There are also some limited fishing tournaments on Guam, including a fishing derby for children organized by the local Aquatic and Wildlife Resources Division. There are few fishing clubs in the in the Northern Mariana Islands. The Saipan Sportfishing Association (SSA) has been in existence for at least 16 years, and is the sponsor of the annual Saipan International Fishing Tournament, which is usually held in August or September. In 1997, the SSA listed approximately 40 members. There is also a Tinian Sportfishing Association, but the status of this club is unknown at this time.

A recent innovation in the Mariana Island is the publication of a free quarterly magazine, Mariana Fishing Magazine, which covers recreational fishing in both Guam and the CNMI.

The founding of the American Samoa Game Fishing Association in 1974 in Pago Pago led to fishing tournaments being held on a regular basis in the territory (Tulafono 2001). A total of 64 tournaments, averaging two to three tournaments per year and 10 to 20 vessels in each competition, were conducted in Pago Pago between 1974 and 1998. However interest in fishing tournaments waned during the late 1990s, with only three vessels participating in the last

tournament held in 1998. The reason for this decline was not entirely clear, but may be related to the expansion of the longline fishery in American Samoa and the shift from commercial trolling to longlining. According to Tulafono, fishermen were more interested in earning income and it was time consuming to switch from longline to troll gear for a weekend of tournament fishing. Tulafono (2001) noted that tag and release programs, which are gaining popularity with recreational and charter-vessel fishermen elsewhere in the U.S., would not be popular in American Samoa. In common with many Pacific islands, fish were caught to keep for food in American Samoa, and fish landings and their distribution through the community were important in order to meet social obligations. Releasing fish would be considered a failure to meet these obligations (Tulafono 2001). More recently, however, fishing tournaments

There is also some recreational fishing activity at some of the Pacific Remote Island Areas (PRIAs), namely at Midway, Wake, Johnston and Palmyra Islands. There are no resident populations at Howland & Baker and Jarvis Islands and fishing activity at these locations is likely minimal. There was a tourist facility at Midway until 2002, which operated a charter boat fishery targeting primarily pelagic fish at Midway Atoll. The company operated five vessels using for charter fishing at Midway: three 22-26 ft catamarans for lagoon and nearshore fishing operations and two 38 ft sportfishing vessels used for blue water trolling. In addition there were approximately seven small vessels maintained and used by Midway residents for recreational fishing. Of this total, three vessels engaged primarily in offshore trolling for PMUS including yellowfin tuna, wahoo and marlin. All vessels fishing at Midway were required to file a float plan prior to a fishing trip and complete the "Midway Sports Fishing Boat Trip Log" upon completion of each trip. The US Fish and Wildlife Service was responsible for compiling these catch data.

At Palmyra Atoll, an island privately owned by The Nature Conservancy, a 22 ft catamaran is used for offshore trolling and four small boats operated within the lagoon used for bonefish angling. There are several craft used for recreational fishing at the two military bases on Johnson and Wake Islands. These include eight Boston whalers, two cabin cruisers and a landing craft at Johnson, and two landing craft and two small vessels at Wake.

Recreational fisheries in the Western Pacific Region

Estimates of recreational catch for the Western Pacific are given in Table 1. The data for Guam, Northern Mariana Islands and American Samoa are based on the proportion of catches landed for sale and catches retained and not sold, in all landings sampled by creel surveys in each area. The ratio of unsold to sold catch in the samples was used in conjunction with the total catch estimate expanded from the creel survey data. This was adjusted downwards based on the creel surveys by the ratio of landings by vessels retaining 100 % of their catch to the total unsold catch. This accounts for that fraction of the catch not sold by commercial fishing vessels. The volume of fish landed by vessels retaining all their catch was labeled the nominal recreational catch.

The recreational catch for Hawaii is generated from the Hawaii Marine Recreational Fisheries Statistical Survey, which is a collaborative effort between the State of Hawaii's Division of Aquatic Resources and the National Marine Fisheries Service (NMFS) Office of Science and

Technology. This survey is part of the NMFS Marine Fisheries Recreational Statistical Survey (MRFSS) which is being modified following a review by the National Academy of Science in 2006, under the auspices of the Marine Recreational Improvement Program (MRIP).

Table 1. Estimated recreational fish catches in the four principal island groups of the Western Pacific Region in 2009

Location	Year	Total catch (lbs)	Unsold catch (lb)	Nominal recreational catch (lb)	Recr. catch as % of total catch	Recr. fishing trips
American Samoa	2009	10,640,460	2,827	2,732	0.03	44
Guam	2009	622,840	329,340	303,391	48.70	3,764
Hawaii	2009	51,178,951	NA	21,692,676	42.38	361,563
NMI	2009	404,633	91,082	85,423	21.11	4,212

Charter vessel sportsfishing

Tables 2-6 present summaries of the charter vessel sportsfishing in the Western Pacific. Charter fishing in Hawaii is more focused on catching blue marlin, which in 2004 formed about 50 % of the total annual charter vessel catch by weight, but in 2008 only formed about a quarter of the charter vessel catch and was superseded by yellowfin. Although commercial troll vessels also take blue marlin, these only form about a ten percent of their catch, with the majority of the target species being yellowfin, mahimahi, and wahoo (Table 3). Unlike other parts of the US, there is little recreational fishery interest in catching sharks in Hawaii.

Guam has a charter fishing sector, which unlike Hawaii caters for both pelagic and bottomfish fishing. Until recently the troll charter fishery was expanding, but, over the past three years the number of vessels involved, and level of fishing, has decreased in response to lower tourist volume from Japan due to the Asian economic recession in the late 1990s. Nonetheless, although compromising only 5 % of Guam's commercial troll fleet, the Guam troll charter industry accounts for 9.3 % of the troll catch and 30% and 20% of the Guam blue marlin and wahoo catch respectively. (See Guam module in this volume).

Charter fishing in NMI is limited, with about ten boats operating on Saipan, and a few vessels on Tinian conducting occasional fishing charters. Tourism is not a significant component of the American Samoa economy, and hence there is little charter fishing activity. There are few vessels suitable for charter-type operations and the American Samoa government does not actively promote tourism and sportsfishing as the local infrastructure for this is limited (Tulafono 2001).

Table 2. Estimated catches by pelagic charter fishing vessels in Guam, Hawaii and Northern Mariana Islands in 2009

Location	Catch (lb)	Effort (trips)	Principal species
Guam	50,945	1,891	Wahoo, Skipjack, Mahimahi, Blue marlin

Hawaii	515,894	8,640	Yellowfin, Blue marlin, Mahimahi, Wahoo
Northern Mariana Islands	4,691	94	Wahoo, Skipjack, Mahimahi, Blue marlin

Charter vessel fishing in the Western Pacific Region has elements of both recreational and commercial fishing. The primary motivation for charter patrons is recreational fishing, with the possibility of catching large game fish such as blue marlin. The charter vessel skipper and crew receive compensation in the form of the patron's fee, but are also able to dispose of fish on local markets, as is the case in Hawaii. The catch composition of charter vessel catch versus conventional commercial trolling in Hawaii reflects the different targeting in the two fisheries. Blue marlins are the dominant feature of charter vessels in Hawaii, while in Guam (Tables 3 & 4), composition of the charter catch is being broadly similar to the mix of species in the commercial troll catches

Table 3. Comparison of species composition of landings made by Hawaii pelagic charter vessels versus commercial troll vessels, 2009

Species	Charter vessels		Commercial vessels	
	Landings (lb)	Percent	Landings (lb)	Percent
Yellowfin tuna	770,737	33.40%	155,793	30.20%
Mahimahi	506,319	21.94%	123,496	23.94%
Wahoo	384,724	16.67%	43,584	8.45%
Skipjack	253,945	11.01%	33,458	6.49%
Blue marlin	222,276	9.63%	131,515	25.49%
Bigeye tuna	103,736	4.50%	6,851	1.33%
Striped marlin	13,554	0.59%	7,294	1.41%
S.N. spearfish	5,565	0.24%	5,679	1.10%
Other	46,458	2.01%	8,224	1.59%
Total	2,307,314	100.00%	515,894	100.00%

Table 4. Comparison of species composition of landings made by Guam pelagic charter vessels versus commercial troll vessels, 2009

Species	Charter		Commercial	
	Landings (lb)	Percent	Landings (lb)	Percent
Mahimahi	22,588	41.79%	124,061	18.63%
Blue Marlin	12,194	22.56%	20,411	3.07%
Wahoo	9,035	16.72%	121,698	18.28%
Skipjack Tuna	8,381	15.51%	322,682	48.46%

Yellowfin Tuna	1,214	2.25%	49,065	7.37%
Others	637	1.18%	27,925	4.19%
Total	54,049	100.00%	665,842	100.00%

In Hawaii there is considerable variation in charter vessel catches between the various islands (Table 5), with the largest charter vessel fishery based on the island of Hawaii. In 2008, charter vessel catches on the island of Hawaii accounted for nearly 40% of the total charter vessel landings within the state, with Oahu, Kauai, and Maui County charter vessels forming the remaining charter vessel catch.

Table 5. Charter vessel catches in Hawaii by island, 2009

Island	Catch	Percent	Trips	Percent	CPUE (lb/trip)
Hawaii	169,151	32.79%	4,052	46.90%	41.75
Kauai	75,520	14.64%	1,284	14.86%	58.82
Maui County*	48,617	9.42%	1,230	14.24%	39.53
Oahu	222,605	43.15%	2,074	24.00%	107.33
Total	515,894	100.00%	8,640	100.00%	59.71

* DAR confidentiality protocols prevent reporting 2007 charter vessel activity for Molokai and Lanai separately, and these are aggregated with data for Maui, reported collectively as Maui County

Most charter vessel fishing on the island of Hawaii is conducted from Kona's small boat harbor at Honokohau, and about one thirds of the charter vessel catch comprises blue marlin (Table 6). Blue marlin used to amount to about two-thirds of the catch, but this number has fallen considerably with the spread of a stronger catch and release ethic for billfish by charter vessel operators at Honokohau. Elsewhere, yellowfin and mahimahi dominate charter vessel landings, with blue marlin comprising between 12% and 24% of catches. Other important species in the charter vessel catches, depending on location, comprise , wahoo, spearfish and skipjack.

Table 6. Composition of charter vessel catches in the Main Hawaiian Islands, 2009

Hawaii	Landings (lb)	Percent	Kauai	Landings (lb)	Percent
Blue marlin	61,829	36.55%	Yellowfin tuna	27,534	36.46%
Yellowfin tuna	45,937	27.16%	Skipjack	17,061	22.59%
Mahimahi	26,036	15.39%	Mahimahi	12,459	16.50%
Wahoo	17,196	10.17%	Blue marlin	9,384	12.43%
Bigeye tuna	4,930	2.91%	Wahoo	6,788	8.99%
Spearfish	4,216	2.49%	Striped marlin	713	0.94%
Skipjack	4,064	2.40%	Kahala	490	0.65%
Striped marlin	2,874	1.70%	Kawakawa	379	0.50%
Other	2,070	1.22%	Other	713	0.94%

Total	169,151	100.00%		75,520	100.00%
Maui	Landings (lb)	Percent	Oahu	Landings (lb)	Percent
Mahimahi	19,983	8.98%	Yellowfin tuna	77,473	34.80%
Blue marlin	10,084	4.53%	Mahimahi	65,017	29.21%
Wahoo	9,320	4.19%	Blue marlin	50,218	22.56%
Yellowfin tuna	4,850	2.18%	Skipjack	12,168	5.47%
Bigeye tuna	1,147	0.52%	Wahoo	10,280	4.62%
Striped marlin	847	0.38%	Striped marlin	2,860	1.28%
Kawakawa	211	0.09%	Spearfish	1,253	0.56%
Spearfish	210	0.09%	Kawakawa	1,133	0.51%
Skipjack	166	0.07%	Bigeye tuna	774	0.35%
Other	1,799	0.81%	Other	1,429	0.64%
Total	48,617	100.00%	Total	222,605	100.00%

Recreational Fishing Data Collection in Hawaii

Recreational fish catches in Hawaii are monitored through the Hawaii Marine Recreational Fishing Survey (HMRFS), a collaborative project of the NMFS Office of Science and Technology and the Hawaii Division of Aquatic Resources. This project is a segment of the nationwide Marine Recreational Fisheries Statistical Survey (MRFSS), which has been used by NMFS to estimate recreational catches in most of the coastal states of the US.

The MRFSS program uses a triple survey approach that has been developed over the 20+ years of its history. For each two-month survey period (wave) a random sample of households is called by telephone to determine how many have done any fishing in the ocean, their mode of fishing (private boat, rental boat, charter boat, or shoreline), what methods were used, and how much effort (number of trips and hours) was expended. Concurrently, surveyors are sent out to boat launch ramps, small boat harbors, and shoreline fishing sites to interview fishermen to fill out intercept survey forms. The intercept survey collects data on fishing area, fishing methods, trip/effort, species caught, and lengths and weights of fish. The sites are randomly selected, but stratified by fishing pressure so that the sites with the highest pressures are likely to be surveyed more often. In addition the charter boat operators are surveyed by a separate survey. This additional survey of the charter fleet serves the same function as the random digit dialing household survey and is necessary because out of town fishers that charter vessels wouldn't be covered by randomly calling the Hawaiian populace. The telephone and charter survey data are used to estimate total statewide fishing effort and the intercept surveys provide detailed catch and trip information. Data from the three surveys are combined and expanded by computer to yield statewide estimates of total effort and catch by species, mode, and county.

NMFS and HDAR contributed joint funding for intercept surveys and charter boat surveys on the islands of Oahu, Hawaii, and Maui. NMFS also funded the Random Digit Dialing household telephone survey via a national contractor beginning in January 2001. The HMRFS project commenced in July 2001 but took until 2003 until annual results were first reported from this initiative.

In 2006, the MRFSS survey was reviewed by the National Research Council of the National Academy of Sciences (NRC 2006). The reviewers were critical of the statistical methods employed to generate expansions of the survey data to annual recreational catch estimates for each state. Consequently, NMFS is conducting an overhaul of the MRFSS survey to respond to the NRC criticisms. As such, readers of this report should understand that there is uncertainty surrounding the various expansions from the HMRFS survey and figures reported here may change as new methods are developed to conduct the expansions from survey data. However, Table 7 provides summaries of the recreational boat and shoreline fish catch between 2003 and 2008 for pelagic and other species of fish.

Table 7. Recreational fish catches in Hawaii between 2003 and 2008. Source: HMRFS

Year	(Fish type)	Boat –based (lbs)	Shore-based (lbs)	Total
2003	Pelagic	14,905,992	422,434	15,328,426
	Others	517,119	1,429,637	1,946,756
	Total	15,423,111	1,852,071	17,275,182
2004	Pelagic	12,210,684	120,780	12,331,464
	Others	1,193,998	1,148,203	2,342,202
	Total	13,404,683	1,268,983	14,673,666
2005	Pelagic	12,804,980	229,060	13,034,040
	Others	795,859	1,015,650	1,811,509
	Total	13,600,839	1,244,710	14,845,549
2006	Pelagic	11,830,852	258,802	12,089,653
	Others	856,243	1,519,289	2,375,533
	Total	12,687,095	1,778,091	14,465,186
2007	Pelagic	13,956,647	114,831	14,071,478
	Others	404,284	346,457	750,741
	Total	14,360,931	461,288	14,822,219
2008	Pelagic	21,802,390	56,937	21,859,327
	Others	231,584	773,611	1,005,195
	Total	22,033,974	830,548	22,864,522
2009	Pelagic	17,071,412	66,635	17,138,048
	Others	272,841	369,993	642,834
	Total	17,344,253	436,629	17,780,882

Figures 2-5 summarize aspects of the boat-based recreational fishery landings for six major pelagic fish species in Hawaii (blue marlin, striped marlin, mahimahi, skipjack, yellowfin and wahoo) between 2003 and 2009, while Figure 6 shows the bimonthly distribution of boat-based fishing effort over the same time period. Skipjack tuna are the most commonly recreationally caught pelagic fish (Figure 2) followed by yellowfin tuna, mahimahi and wahoo. In terms of weight, however, yellowfin tuna dominates recreational pelagic fish catches (Figure 3).

Although blue marlin numbers in the catch are small compared to other species, the much greater average weight (Figure 3) means that it can comprise a significant fraction of the recreational catch by weight. Average weights for most species tended to be relatively similar between years for mahimahi, skipjack and wahoo, but may vary considerable between years for blue marlin, striped marlin and yellowfin tuna. This is also reflected in the nominal catch rate (lbs/trip) in Figure 4, where yellowfin catch rate was much higher in 2003 than in 2004 and 2005, and increased to a new maximum in 2008. The distribution of fishing recreational fishing effort shows that boat based activity is highest in the summer and fall when the weather is at its most clement in Hawaii.

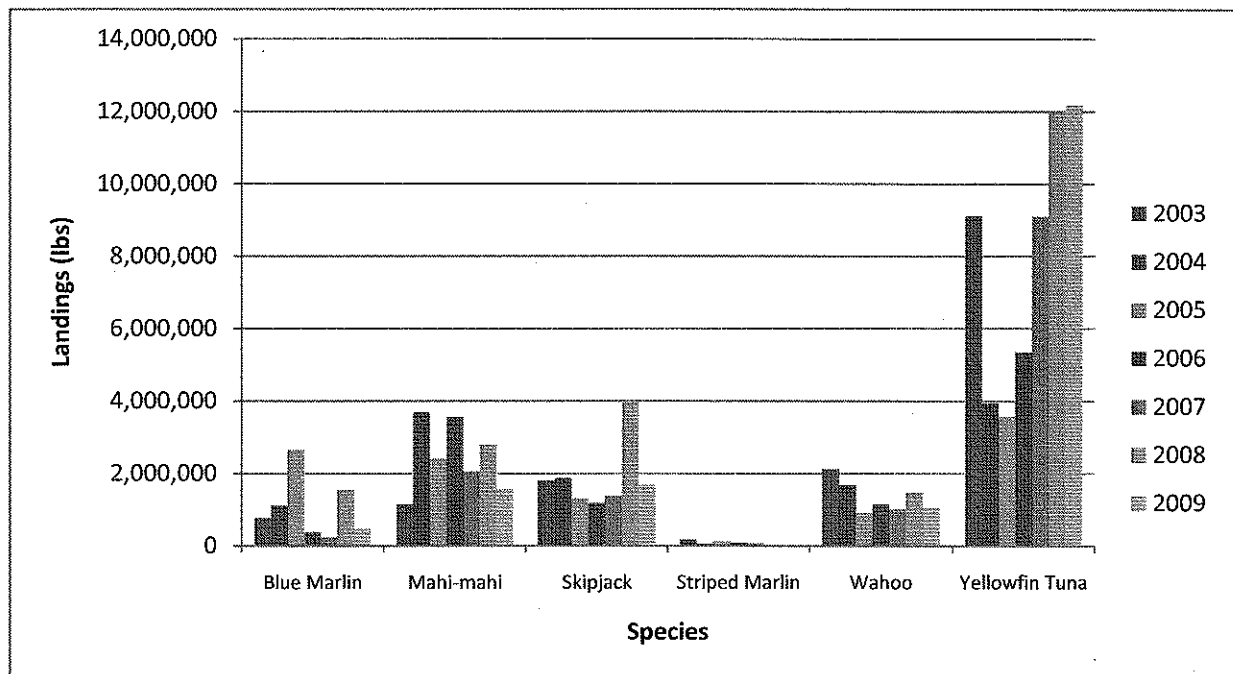


Figure 2. Annual recreational fishery landings by weight of six major pelagic fish species in Hawaii between 2003 and 2008

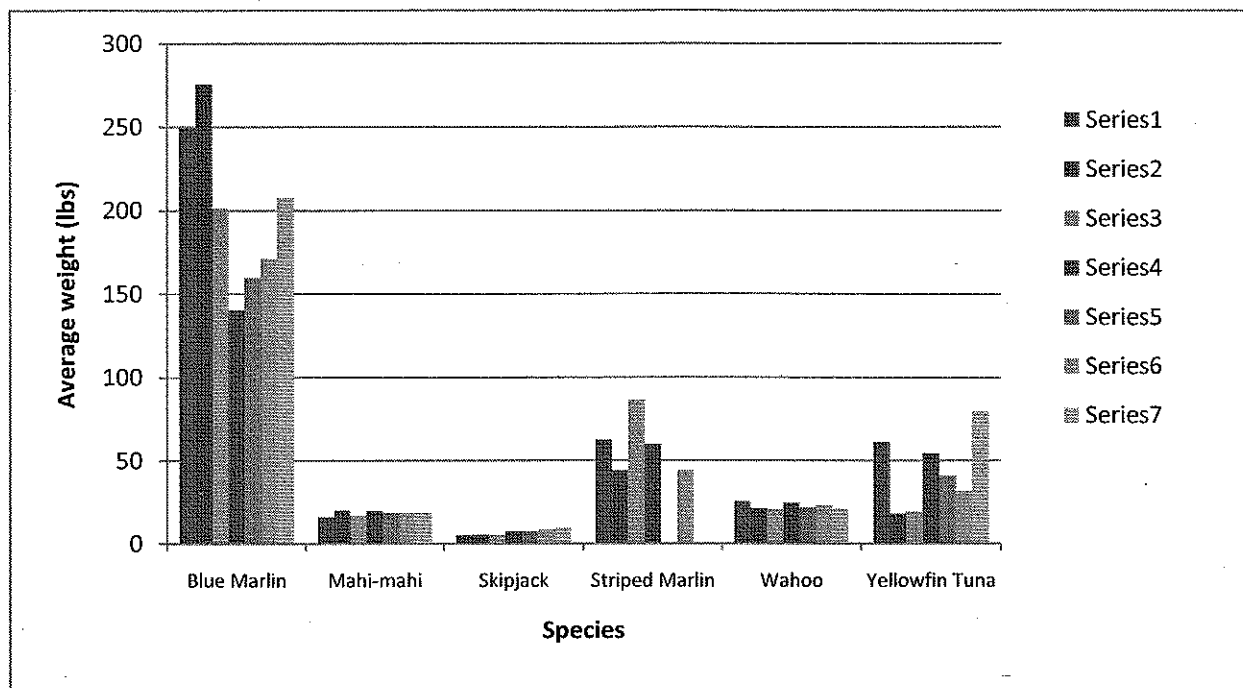


Figure 3. Average weight of six major pelagic fish species caught by recreational fishing in Hawaii between 2003 and 2008

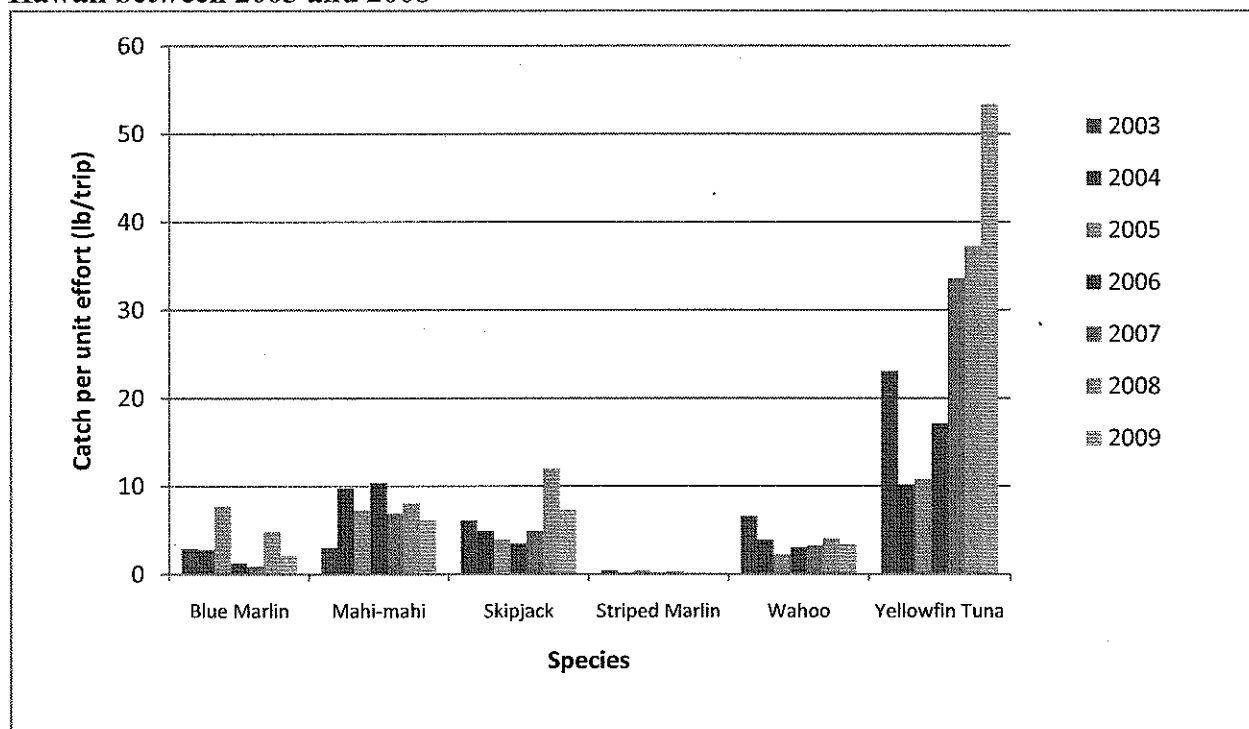


Figure 4. Annual recreational catch per unit effort (lbs per trip) for six major pelagic species in Hawaii between 2003 and 2008

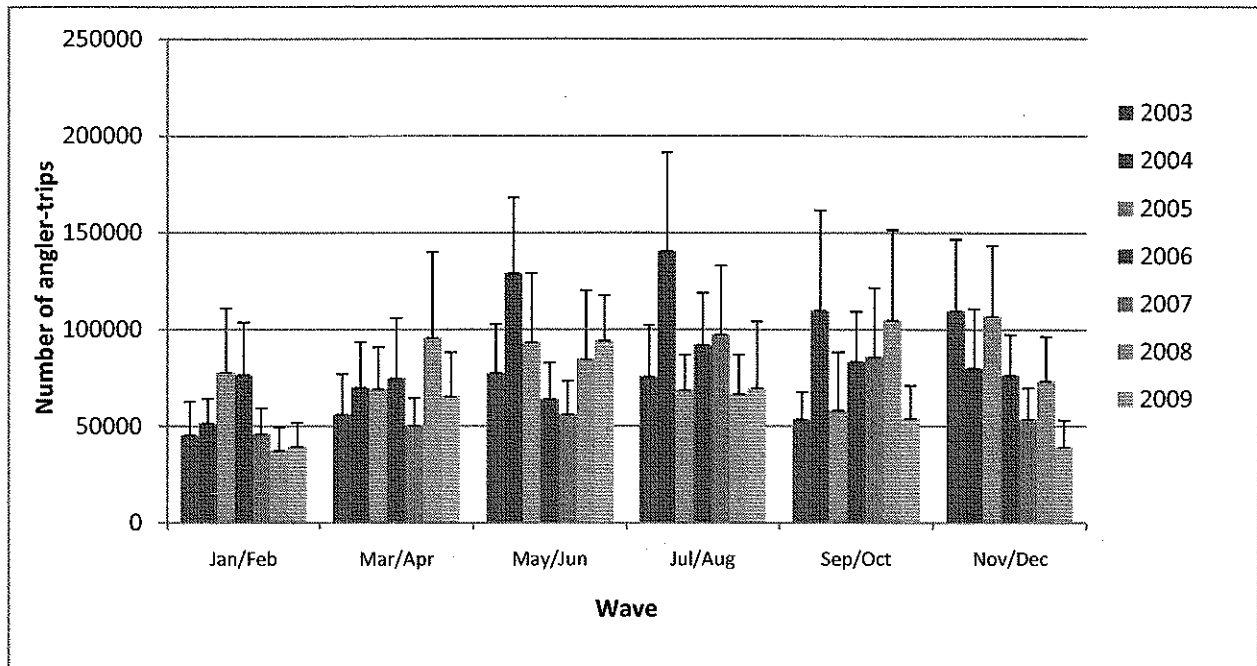


Figure 5. Annual private vessel recreational fishing effort in Hawaii between 2003 and 2008

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