Marine Sanctuaries Conservation Series ONMS 2015-07

Economic Impact of the Recreational Fisheries on Local County Economies in California's National Marine Sanctuaries 2010, 2011 and 2012

U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Ocean Service
Office of National Marine Sanctuaries

June 2015

About the Marine Sanctuaries Conservation Series

The Office of National Marine Sanctuaries, part of the National Oceanic and Atmospheric Administration, serves as the trustee for a system of 14 marine protected areas encompassing more than 170,000 square miles of ocean and Great Lakes waters. The 13 national marine sanctuaries and one marine national monument within the National Marine Sanctuary System represent areas of America's ocean and Great Lakes environment that are of special national significance. Within their waters, giant humpback whales breed and calve their young, coral colonies flourish, and shipwrecks tell stories of our maritime history. Habitats include beautiful coral reefs, lush kelp forests, whale migrations corridors, spectacular deep-sea canyons and underwater archaeological sites. These special places also provide homes to thousands of unique or endangered species and are important to America's cultural heritage. Sites range in size from one square mile to almost 140,000 square miles and serve as natural classrooms, cherished recreational spots, and are home to valuable commercial industries.

Because of considerable differences in settings, resources and threats, each marine sanctuary has a tailored management plan. Conservation, education, research, monitoring and enforcement programs vary accordingly. The integration of these programs is fundamental to marine protected area management. The Marine Sanctuaries Conservation Series reflects and supports this integration by providing a forum for publication and discussion of the complex issues currently facing the sanctuary system. Topics of published reports vary substantially and may include descriptions of educational programs, discussions on resource management issues, and results of scientific research and monitoring projects. The series facilitates integration of natural sciences, socioeconomic and cultural sciences, education, and policy development to accomplish the diverse needs of NOAA's resource protection mandate. All publications are available on the Office of National Marine Sanctuaries Web site (http://www.sanctuaries.noaa.gov).

Economic Impact of the Recreational Fisheries on Local County Economies in California's National Marine Sanctuaries 2010, 2011 and 2012

Vernon R. Leeworthy & Danielle Schwarzmann

NOAA's Office of National Marine Sanctuaries
Conservation Science Division

U.S. Department of Commerce
Penny Pritzker, Secretary

National Oceanic and Atmospheric Administration
Kathryn Sullivan, Ph.D.
Under Secretary of Commerce for Oceans and Atmosphere

National Ocean Service
Russell Callender, Ph.D., Acting Assistant Administrator

Office of National Marine Sanctuaries
John Armor, Acting Director

Silver Spring, Maryland
June 2015

Disclaimer

Report content does not necessarily reflect the views and policies of the Office of National Marine Sanctuaries or the National Oceanic and Atmospheric Administration, nor does the mention of trade names or commercial products constitute endorsement or recommendation for use.

Report Availability

Electronic copies of this report may be downloaded from the Office of National Marine Sanctuaries web site at http://sanctuaries.noaa.gov.

Cover

Kelp bass. Steve Lonhart, Monterey Bay national Marine Sanctuary.
Kelp rockfish in the Channel Islands National Marine Sanctuary. Claire Fackler, NOAA National Marine Sanctuaries.

Suggested Citation

Leeworthy, V., & Schwarzmann, D. 2015. Economic Impact of the Recreational Fisheries on Local County Economies in California's National Marine Sanctuary 2010, 2011 and 2012. *Marine Sanctuaries Conservation Series ONMS-2015-07. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Office of National Marine Sanctuaries, Silver Spring, MD. 27 pp.*

Contact

Dr. Vernon R. (Bob) Leeworthy
Chief Economist
Office of National Marine Sanctuaries
1305 East West Highway, SSMC4, 11th floor
Silver Spring, MD 20910
Telephone: (301) 713-7261
Fax: (301) 713-0404
E-mail: Bob.Leeworthy@noaa.gov

Dr. Danielle N Schwarzmann
Economist
Office of National Marine Sanctuaries
1305 East West Highway
Silver Spring, MD 20910
Telephone: (301) 713-7254
Fax: (301) 713-0404
Danielle.Schwarzmann@noaa.gov

Acknowledgements

We would like to acknowledge Cheryl Chen with Point97 and Connie Ryan and Kevin Hitchcock with California Department of Fish and Wildlife.

Abstract

This report estimates the economic impact or contribution of recreational fishing within California's national marine sanctuaries. The methodology applies the IMPLAN input-output model to estimates of total annual expenditures derived by taking estimates of person-days by mode of access (e.g. shore, private/rental boat and commercial passenger fishing vessels) from the State of California's Recreational Fishing Statistics Program and multiplying by NOAA Fisheries' expenditure profiles by mode of access. The IMPLAN model is then used to calculate output, income, value- added and employment for the collection of nine counties (study area) where most of the economic impact takes place. Economic impacts are estimated for 2010, 2011, 2012 and the three-year average. Expenditure impacts are estimated separately for trip expenditures and durable good expenditures. Trip expenditures' impacts are appropriate for analyzing regulations or other policy/management alternatives that involve small or marginal changes in fishing effort. This report also presents the trends in person–days of recreational fishing by mode from 2004 through 2012.

The three-year average for 2010 to 2012 finds the total economic impact/contribution from recreational fishing in California sanctuaries to be $213.1 million in output, $129.0 million in value-added, $74.6 million in income and more than 1,370 jobs. During the study period, 2010 saw the lowest levels of output, value added, income and jobs. In total California sanctuaries accounted for 13.4% of the total person-days of recreational fishing from California on average each year. Shore fishing in California sanctuaries accounted for 9.9%, private-rental boat fishing accounted for 25.8% and commercial passenger fishing vessels accounted for 22.3% of total California person-days by mode of access.

Key Words

Economic impact, income, jobs, California, recreational fishing, output, value-added, person-days.

Table of Contents

List of Figures and Tables

Figure/Table Number and Title **Page**

Chapter 1 Introduction

This report is part of the Socioeconomic Research & Monitoring Program for California's national marine sanctuaries. Socioeconomic priorities were established for all West Coast Region (WCR) sanctuaries in the "*Office of National Marine Sanctuaries West Coast Region Socioeconomic Plan FY2013 – FY2014* (Office of National Marine Sanctuaries, 2012)". This report also supports a "national" Office of National Marine Sanctuaries (ONMS) priority to document the connection between the national marine sanctuary resource uses and local, regional and national economies.

Sources of Information and Estimation of Effort

This report addresses magnitude of recreational fishing in California sanctuaries and the resulting economic impacts/contributions from 2010-2012. The data used to estimate the number of recreational fishing person-days in California sanctuaries comes from the California Department of Fish and Wildlife (CDFW). The data are available from the Pacific RecFIN public site or via written request to the CDFW. Data presented in this report are from years 2004-2012, and the economic analysis is for years 2010 -2012. The RecFIN data are used to show trends in the number of recreational fishing person-days within the sanctuary by resident and non-resident status.

To obtain estimates of recreational shore fishing within California sanctuaries, data sent to ONMS from CDFW was used to determine if an access point is within the sanctuary. The data from CDFW contained GIS layers with the California Recreational Fishing Survey (CRFS) district and site locations of man-made structures and beach/bank sites. If an access point was in the sanctuary or within a 1.25 mile buffer of the sanctuary's border, then the location was considered to be in California sanctuaries.

For boat modes, the amount of fishing effort that takes place in national marine sanctuaries is based on the best overlay of CDFW ten-minute by ten-minute blocks on sanctuary boundaries. See Chen, Leeworthy and Schwarzmann (2015) for detailed methods of estimation.

The next step is to determine what counties should be included in the California sanctuaries study area. If the sanctuary was adjacent to the full coastal boundary of a county it was included in the study area. Then, data from the American Community Survey (U.S. Department of Commerce, Bureau of the Census) was used to determine the percentage of workers from neighboring counties that worked within the coastal counties. If more than one percent of workers in a non-adjacent county worked in an adjacent coastal county, the non-adjacent county was included in the study area. This inclusion was made to account for the majority of multiplier impacts from spending in local area counties.

The study areas for each of the four California NMS are presented below in Table 1.1. Figure 1.1, 1.2, 1.3 and 1.4 present the maps of the study areas and fishing block IDs that are included in within each of the study areas. Additionally, the CDFW districts are also presented on the maps. CDFW districts are used to geographically identify different regions along the coast.

The impacts of recreational fishing to California are the summation of the individual impacts of the four California sanctuaries; Greater Farallones National Marine Sanctuary (GFNMS), Monterey Bay National Marine Sanctuary (MBNMS), Cordell Bank National Marine Sanctuary (CBNMS) and Channel Islands National Marine Sanctuary (CINMS). Greater Farallones National Marine Sanctuary and Cordell Bank National Marine Sanctuary were recently expanded, this analysis reflects the expansion areas. A more detailed description of this process and results can be found in Chen, Leeworthy and Schwarzmann (2015).

Table 1.1 The California sanctuaries Study Areas

County	Greater Farallones	Monterey Bay	Cordell Bank	Channel Islands	Coastal County
Alameda	No	Yes	No	No	Non-Coastal
Contra Costa	Yes	Yes	No	No	Non-Coastal
Los Angeles	No	No	No	Yes	Coastal
Marin	Yes	No	Yes	No	Coastal
Mendocino	Yes	No	No	No	Coastal
Monterey	No	Yes	No	No	Coastal
San Francisco	Yes	Yes	No	No	Coastal
San Luis Obispo	No	Yes	No	No	Coastal
San Mateo	No	Yes	Yes	No	Coastal
Santa Barbara	No	No	No	Yes	Coastal
Santa Clara	No	Yes	No	No	Non-Coastal
Santa Cruz	No	Yes	No	No	Coastal
Solano	Yes	Yes	No	No	Non-Coastal
Sonoma	Yes	No	Yes	No	Coastal
Ventura	No	No	No	Yes	Coastal

If a person lives within one of the study areas, they were considered a resident of California sanctuaries. If the person lived outside one of the fifteen counties presented in Table 1.1 then they were considered a non-resident of the sanctuaries' study areas.

To estimate the economic impacts/contributions on the local counties of California sanctuaries, CDFW data from years 2010-2012 was used in conjunction with Angler Expenditure Profiles developed by the National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries Service (NMFS) (Lovell et al., 2013).

The IMPLAN model was used to estimate the market economic impacts/contributions of recreational fishing to the California sanctuaries study areas. IMPLAN is an input-output model developed to estimate the impacts of changes in a specified region (Day, 2011). The 2009 IMPLAN data set was used to estimate the economic recreational fishing impacts. These economic estimates take into account recreational fin-fishing and recreational invertebrate fishing.

The economic estimates in this report include both the direct and indirect impacts of recreational fishermen's expenditures throughout the economy. The direct effect considers the initial expenditures made by fishermen. The indirect effect considers the initial expenditures' backward linkages in other industries; the flow of spending is traced back through the supply chain. They are called indirect effects because spending by fishermen is stimulating increased production in other industries within the study area. Lastly, induced effects account for increased employee income, and consequently employee spending, resulting from the directly and indirectly affected industries within the study area (Day, 2011). The addition of the indirect and induced impacts is what is generally referred to as the "multiplier" impacts. The break-out of these impacts/ contributions is not presented here. For those details, see Chen, Leeworthy and Schwarzmann (2015).

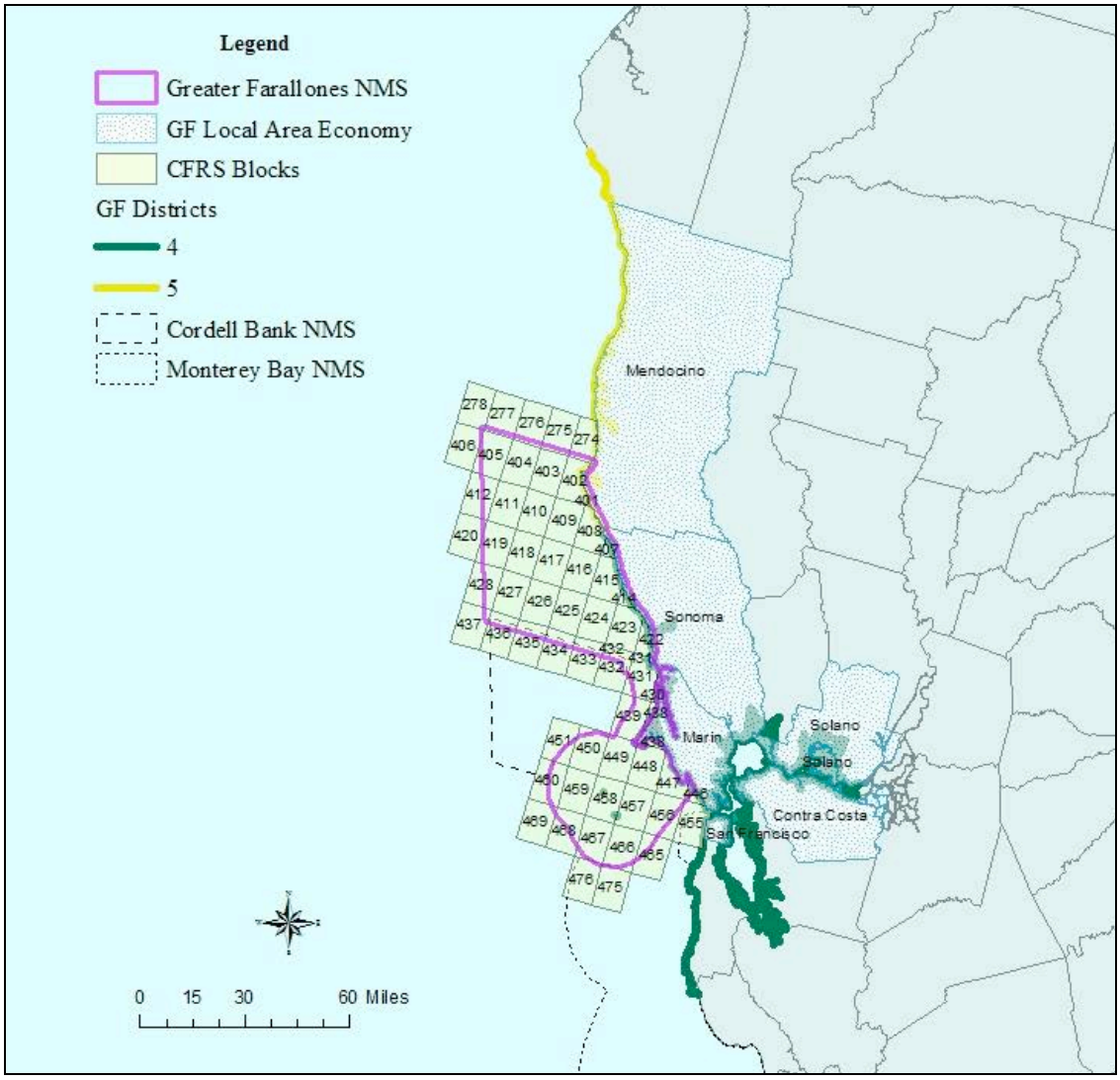


Figure 1.1 GFNMS Study Area Map

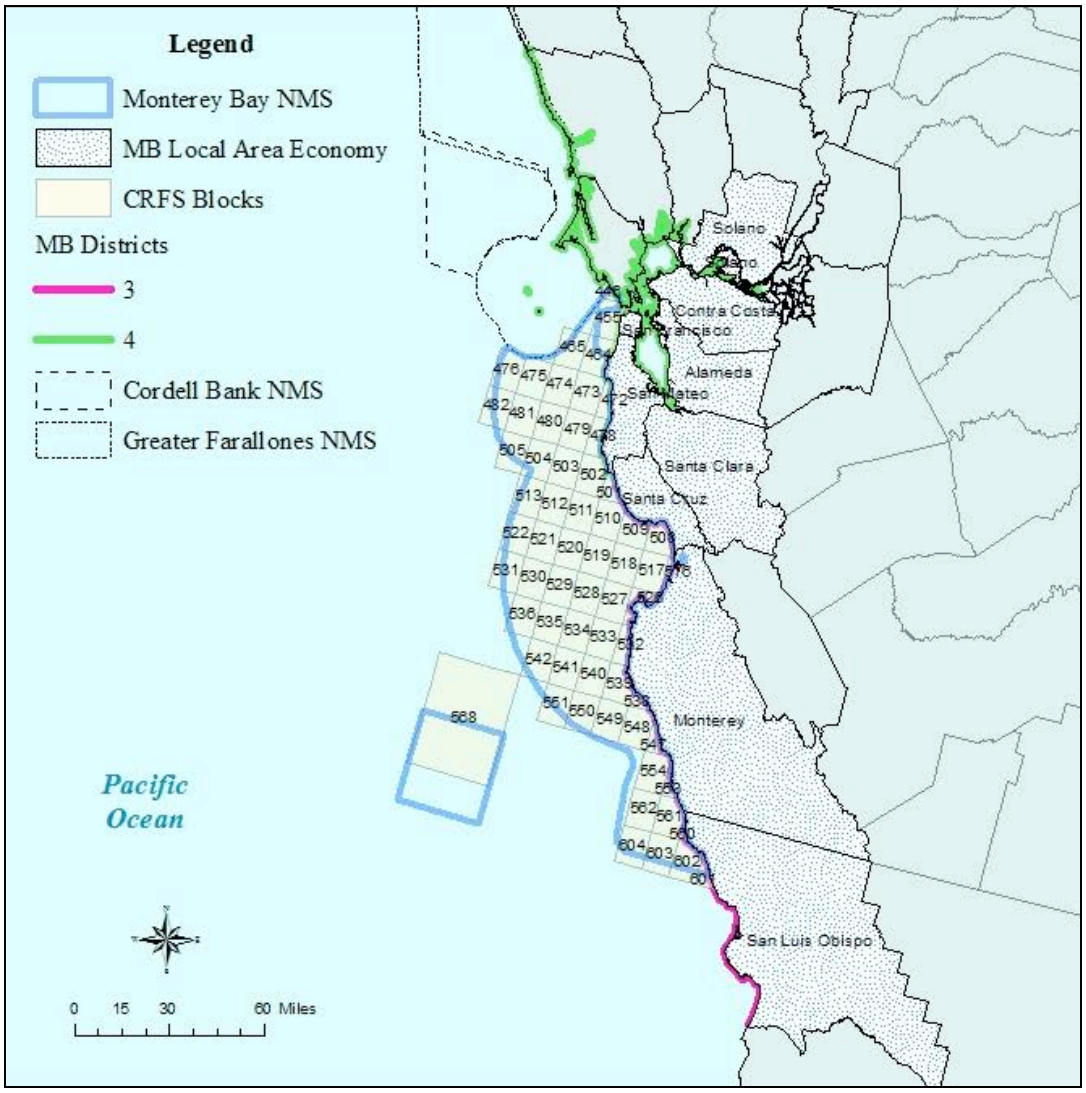


Figure 1.2 MBNMS Study Area Map
(Block 568 only partly covers Davidson Seamount. It is the best overlay that can be done with CDFW blocks).

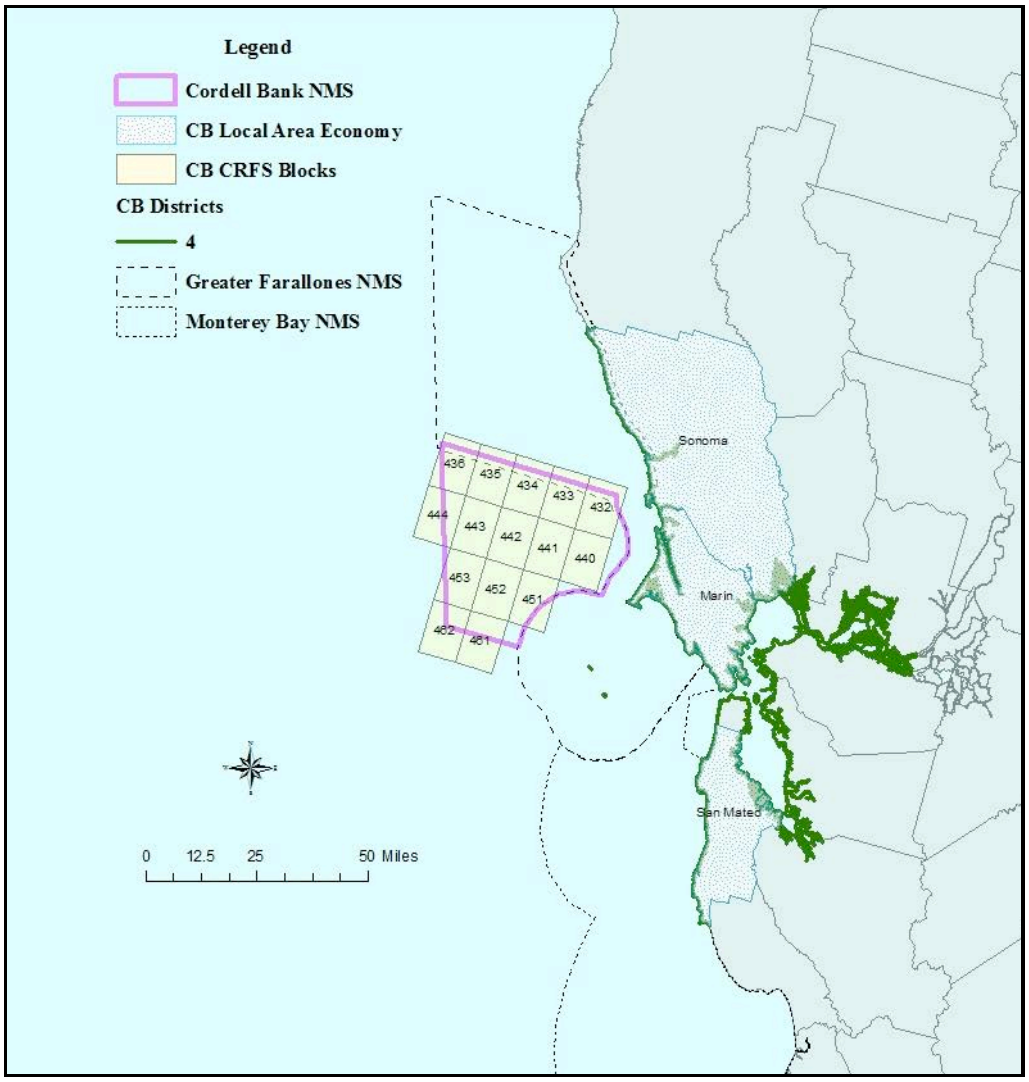


Figure 1.3 CBNMS Study Area Map

Figure 1.4 CINMS Study Area Map

Chapter 2 focuses on trends in person-days of recreational fishing within the sanctuary. There are three types of fishing that were analyzed; shore-mode fishing, private/rental boat and commercial passenger fishing vessels. It is customary to group together private boats and rental boats, both the State of California CDFW and NOAA Fisheries analyze these two forms of boating as a unit. Shore fishing is defined as fishing accessed on beaches, banks and man-made structures. Private boats are defined as boats belonging to an individual not for rent or with paying passengers. Rental boats are defined as a boat that is rented without crew or a guide. The last section of Chapter 2 reviews Commercial Passenger Fishing Vessels (CPFV). There are two types of boats that fall into the CPFV category. The first is a charter boat, which is operating under charter for a specified price, time, etc. It usually means the boat is closed to anyone not in the group hiring the charter boat. The second type, a party boat, is a boat on which fishing space and privilege are provided for a fee per angler and are often referred to as head-boats

(RecFIN, 2014). The terminology to describe person-days and mode of access is presented in Table 1.2.

Table 1.2 Definition of Key Terms (adapted from RecFin, 2014)

Term	Definition
Person-Days	The number of days (not trips) a person fishes
Shore Fishing	Fishing accessed on beaches, banks and man-made structures.
Private-Rental Boat Fishing	Private boats are defined as belonging to an individual not for rent or with paying passengers. Rental boats are defined as a boat that is rented without crew or a guide.
Commercial Passenger Vehicle Fishing (CPFV)	There are two categories. The first is a charter boat, operating under charter for a specified price, time, etc. A party boat, is a boat on which fishing space and privilege are provided for a fee per angler.

Chapter 3 presents and discusses expenditure profiles of recreational anglers in California. NOAA produces estimates of expenditures by person-day based on the three types of recreational fishing and resident status. In addition, the annual expenditures on durable goods are also estimated and discussed by each mode.

Chapter 4 presents the results of the IMPLAN model. These results include total output, value added, income and employment (measured in number of full and part-time jobs) resulting from recreational fishing in the sanctuary. Results are estimated by mode for each year from 2010-2012 and a three-year average.

Chapter 5 presents a summary and conclusions.

Chapter 2 Recreational Fishing Person-days

Shore Angler Person-days

Person-days are defined as the number of days a person fishes. If a person takes a one week trip and fishes for five days, then that would be counted as five person-days. Raw survey data was extrapolated from the CDFW, RecFIN website and used to make population estimates of person-days in the California sanctuaries. A more detailed explanation of the process can be found in Chen, Leeworthy and Schwarzmann (2015). The person-day trends account for recreational fin-fishing from 2004 through 2012, but beginning in 2010 through 2012 the CRFS data includes invertebrate recreational fishing person-day effort too.

Figure 2.1 presents the number of person-days of recreational shore fishing in California's NMS from 2004 to 2012. Only two of the four NMS are adjacent to the shoreline; Monterey Bay National Marine Sanctuary (MBNMS) and Greater Farallones National Marine Sanctuary (GFNMS). From 2004 to 2012 the number of person-days varied, reaching a low point in 2010. Person-days were highest in 2011, and have seen a significant increase from 2010 to 2012 exceeding the level achieved in 2004.

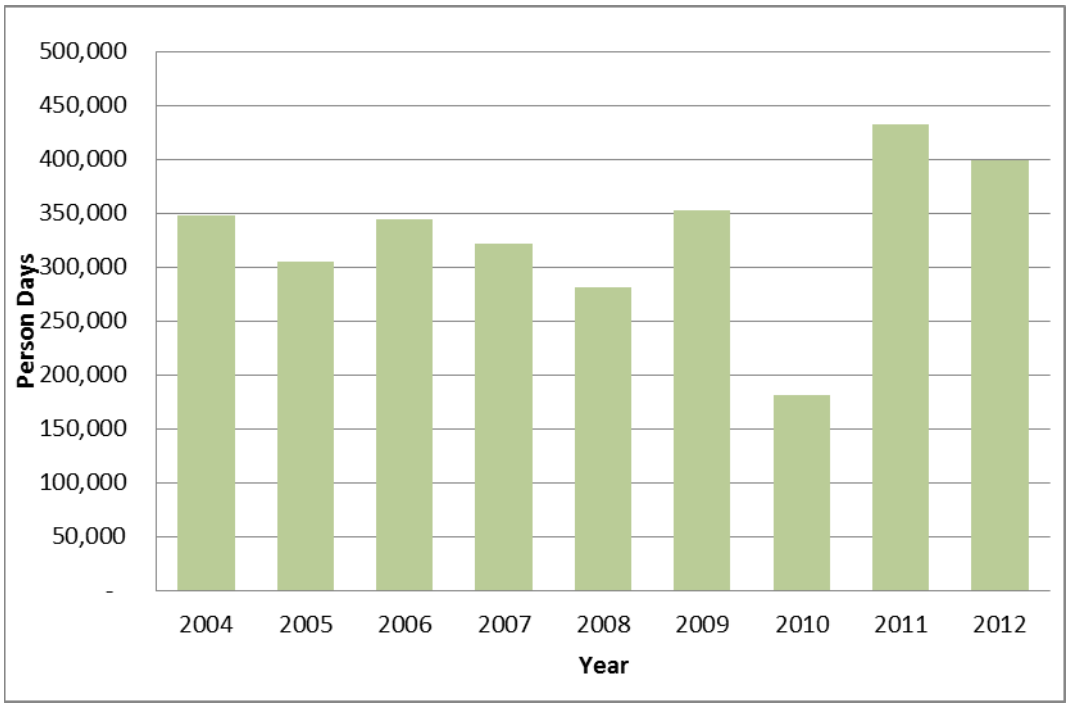


Figure 2.1 California sanctuaries Shore Fishing Person-days

Next, the person-days were analyzed by resident or non-resident status. As is evident in Table 2.1 and Figure 2.2, most of those accessing the shore for recreational fishing are residents of the study area.

For estimating the economic impacts/contributions of recreational fishing, we limited this to years 2010, 2011, and 2012 and then report the three-year average. Table 2.1 reports the person-days for shore mode access for the three years and the average and the proportion of all shore mode person-days in California that took place in California sanctuaries. The proportion of shore mode person-days in California accounted for in California sanctuaries varied from a low of 6.1% in 2010 to a high of 14.2% in 2011 with a three-year average of 9.9%.

From 2010 to 2012 more than 90% of total shore anglers in the sanctuaries were residents. Overall, from 2004 to 2012 the number of shore angler person-days has increased within California sanctuaries, as has the percentage of residents fishing from the shore.

Table 2.1 California sanctuaries Shore Fishing Person-days in California by Resident Status

Year	Resident	Non-Resident	Total
2010	163,785	17,605	181,390
% in sanctuaries[1]			6.1%
2011	412,186	19,945	432,130
% in sanctuaries[2]			14.2%
2012	371,730	27,751	399,482
% in sanctuaries[3]			9.5%
Average	315,900	21,767	337,667
% in sanctuaries[4]			9.9%

[1] This is the 2010 number of total shore mode person-days in California. The value is 2,992,337 person-days.
[2] This is the 2011 number of total shore mode person-days in California. The value is 3,045,134 person-days.
[3] This is the 2012 number of total shore mode person-days in California. The value is 4,226,709 person-days.
[4] This is the average number of total shore mode person-days in years 2010, 2011 and 2012 in California. The value is 3,421,393 person-days.

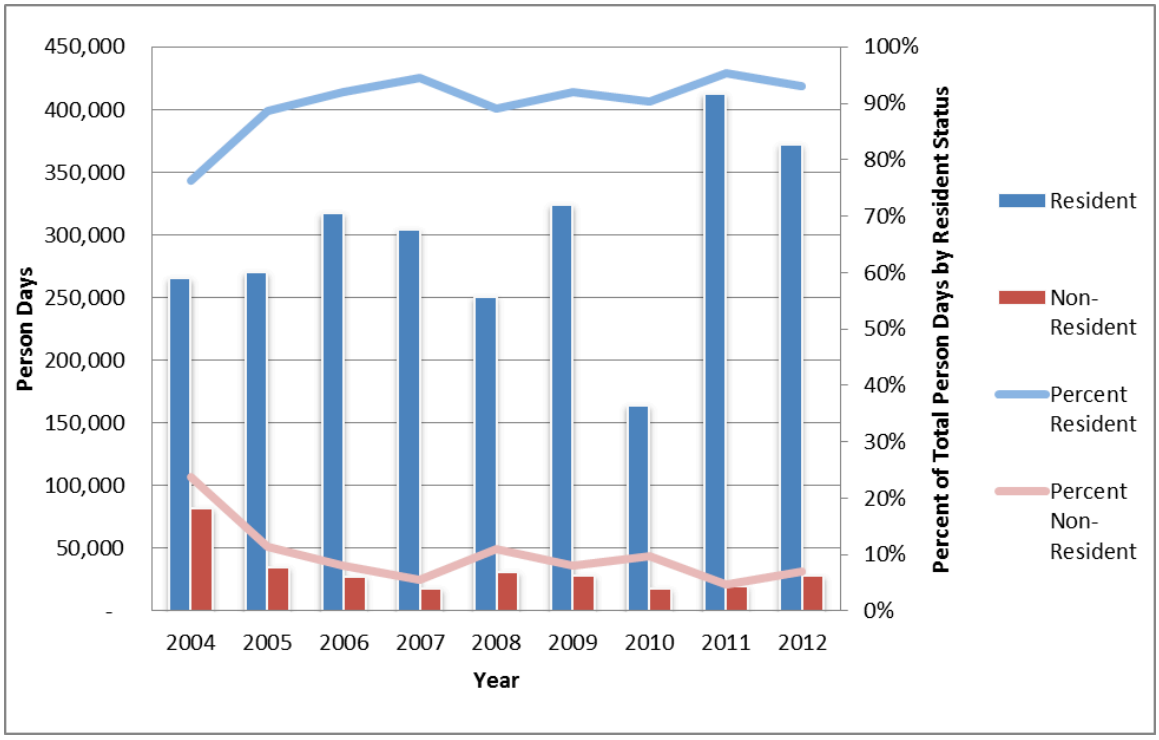


Figure 2.2 California sanctuaries Shore Fishing Person-days by Resident Status

Private/rental Boat Person-days

As previously discussed private boats are defined as boats belonging to an individual not for rent or with paying passengers. A rental boat is defined as a boat that is rented without crew or a guide. With the exception of 2004, private/rental boat person-days, takes the shape of 'U' from 2005 through 2012, with the minimum number of person-days having occurred in 2008 (Figure 2.3).

Residents accounted for more than 75% of total private-rental boat trips 2010 to 2012 in California sanctuaries (Figure 2.4). In 2011, residents made the highest percentage of private-rental boat person-days out of the three years, accounting for 82.9% of total person-days. The three-year average was 79%.

For the three years 2010 to 2012, person-days of private-rental boat fishing in California sanctuaries as a proportion of California total person-days ranged from a low of 18.0% in 2011 to a high of 33.1% in 2012 with a three-year average of 25.8% (Table 2.2).

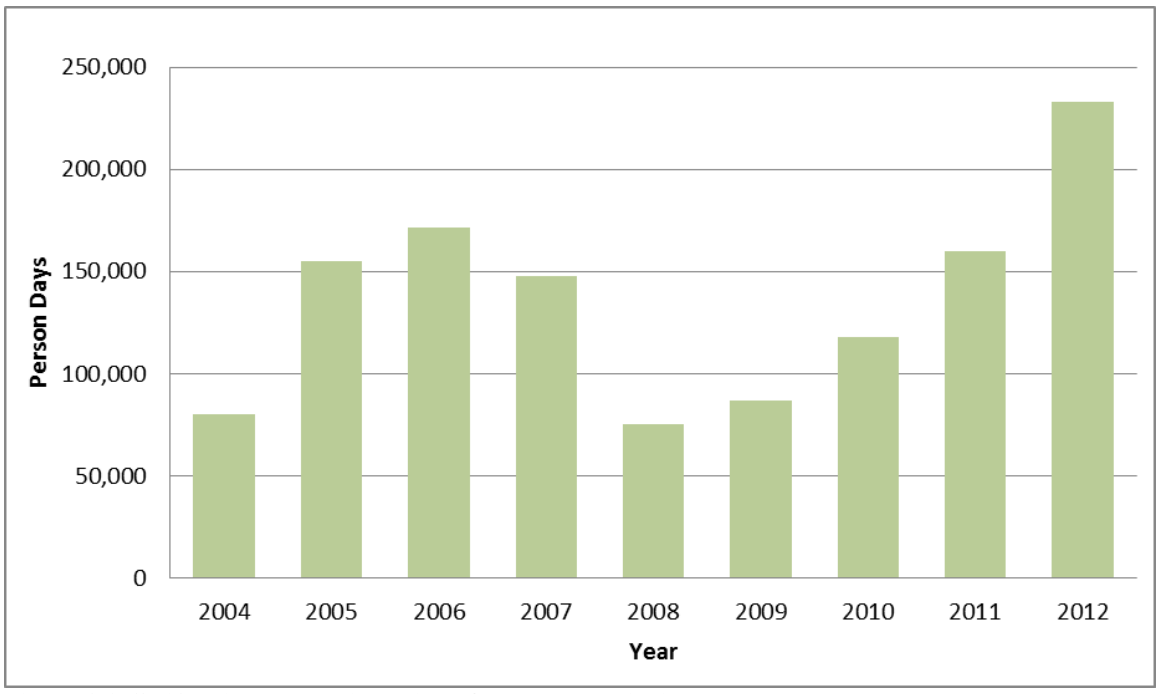


Figure 2.3 California sanctuaries Private/rental Boat Fishing Person-days

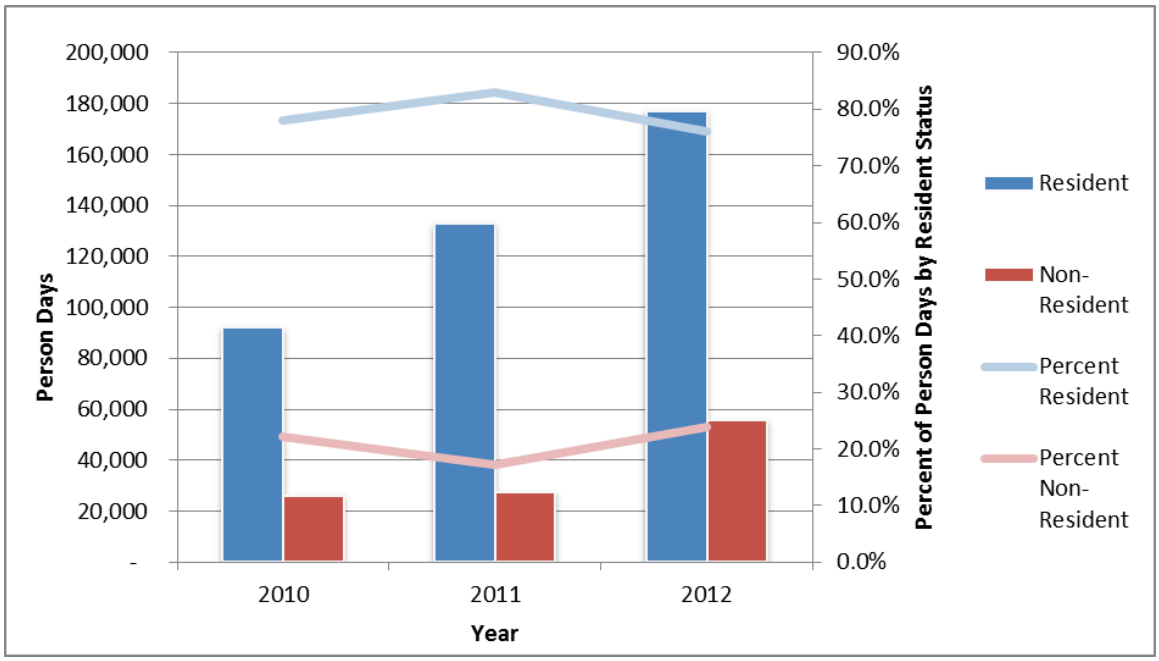


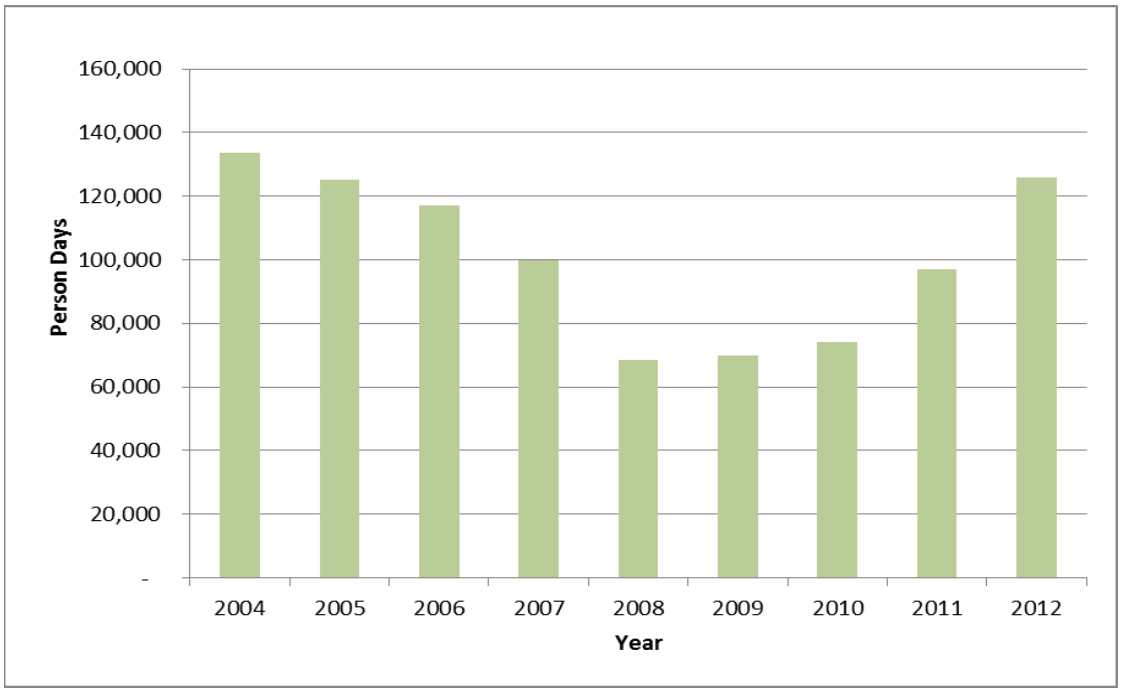
Figure 2.4 California sanctuaries Private/rental Boat Fishing Person-days by Resident Status

Table 2.2 California sanctuaries Private/rental Boat Fishing Person-days in California by Resident Status

Year	Resident	Non-Resident	Total
2010	91,993	26,078	118,071
% in sanctuaries[5]			18.0%
2011	132,748	27,440	160,188
% in sanctuaries[6]			25.8%
2012	177,230	55,588	232,818
% in sanctuaries[7]			33.1%
Average	133,990	36,369	170,359
% in sanctuaries[8]			25.8%

Commercial Passenger Fishing Vessels – Person-days

From 2004 through 2008 the number of CPFV fishing person-days declined, but from 2008 through 2012 the number of person-days has been increasing reaching the level in 2005 (Figure 2.5).



[5] This is the 2010 number of total private-rental boating person-days in California. The value is 654,783 person-days.
[6] This is the 2011 number of total private-rental boating person-days in California. The value is 620,603 person-days.
[7] This is the 2012 number of total private-rental boating person-days in California. The value is 704,076 person-days.
[8] This is the average number of total private-rental boating person-days in years 2010, 2011 and 2012 in California. The value is 659,821 person-days.

Figure 2.5 California sanctuaries CPFV Fishing Person-days

There was less of a difference in the percentage of non-residents and residents using CPFV to fish recreationally than the other two modes of fishing. The difference in total person-days between residents and non-residents has been declining for the study period 2010 through 2012 nearing parity (Figure 2.6).

Table 2.3 California sanctuaries CPFV Person-days in California by Resident Status

Year	Resident	Non-Resident	Total
2010	42,201	32,066	74,267
% in sanctuaries[9]			23.9%
2011	53,262	43,821	97,083
% in sanctuaries[10]			18.2%
2012	64,642	61,332	125,974
% in sanctuaries[11]			25.7%
Average	53,368	45,740	99,108
% in sanctuaries[12]			22.3%

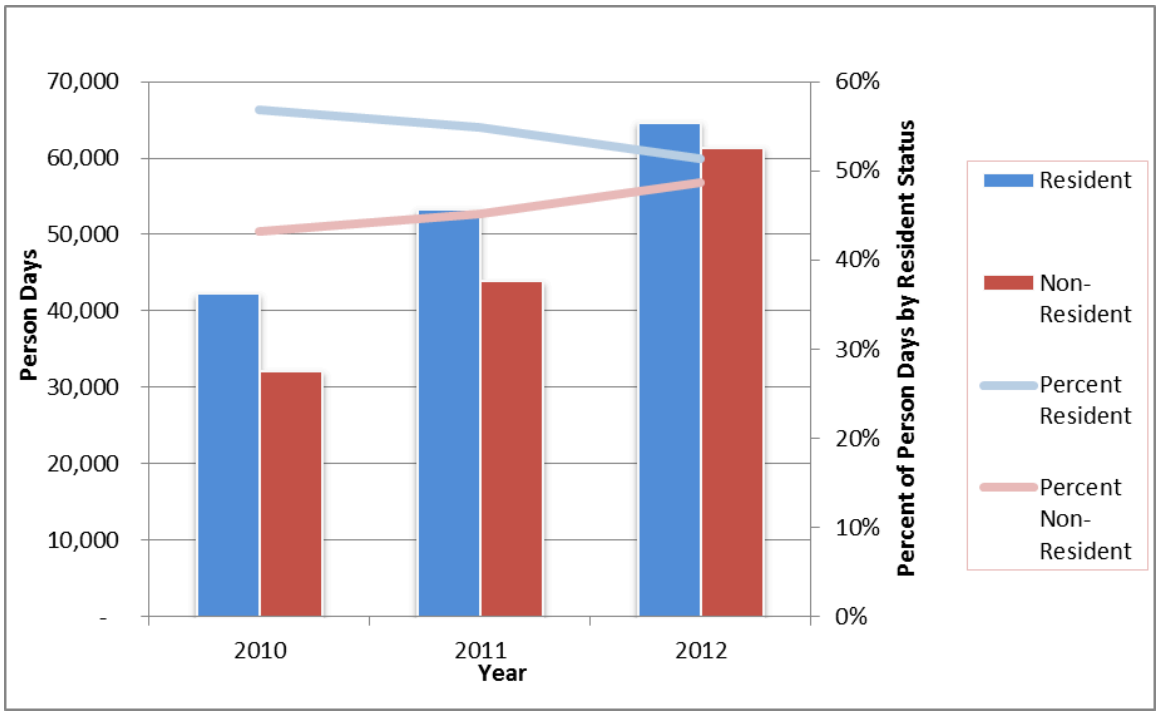


Figure 2.6 California sanctuaries CPFV Fishing Person-days by Resident Status

[9] This is the 2010 number of total CPFV person-days in California. The value is 310,161 person-days.
[10] This is the 2011 number of total CPFV person-days in California. The value is 532,268 person-days.
[11] This is the 2012 number of total CPFV person-days in California. The value is 490,539 person-days.
[12] This is the average number of total CPFV person-days in years 2010, 2011 and 2012 in California. The value is 444,323 person-days.

Summary

On average, nearly one-seventh of total recreational fishing person-days that occurred in California were within the sanctuaries. For the three years 2010 to 2012, the average annual share of California recreational fishing in California sanctuaries was 9.9% for shore fishing, 25.8% for private-rental boat fishing, and 22.3% for CPFV fishing.

Table 2.4 California sanctuaries Total Recreational Person-Days in California by Fishing Mode and Year

Mode	2010	2011	2012	Average
Shore	181,390	432,130	399,482	337,667
% in sanctuaries[13]	6.1%	14.2%	9.5%	9.9%
Private/rental Boating	118,071	160,188	232,867	170,375
% in sanctuaries[14]	18.0%	25.8%	33.1%	25.8%
CPFV	74,267	97,083	125,974	99,108
% in sanctuaries[15]	23.9%	18.2%	25.7%	22.3%
Total of All Modes	373,729	689,402	758,324	607,151
% in sanctuaries[16]	9.4%	16.4%	14.0%	13.4%

[13]The 2010 number of total shore mode person-days in California is 2,992,337, 2011 had 3,045,134 person-days, 2012 had 4,226,709 person-days, and the average number across the study period of 2010 through 2012 is 3,421,393 person-days.

[14]The 2010 number of total private-rental person-days in California is 654,783, 2011 had 620,603 person-days, 2012 had 704,076 person-days, and the average number across the study period of 2010 through 2012 is 659,821 person-days.

[15]The 2010 number of total CPFV person-days in California is 310,161, 2011 had 532,268 person-days, 2012 had 490,539 person-days, and the average number across the study period of 2010 through 2012 is 444,323 person-days.

[16]The 2010 number of total recreational fishing person-days in California is 3,957,281, 2011 had 4,198,004 person-days, 2012 had 5,421,325 person-days, and the average number across the study period of 2010 through 2012 is 4,525,537 person-days.

Chapter 3 Recreational Fishing Expenditures

Total expenditures were estimated using the Angler Expenditure Profiles developed by NOAA Fisheries (Lovell et al., 2013). This is based on survey data collected by NOAA from anglers and is completed approximately every five years. The latest year Angler Expenditure Profiles were completed was 2011 and those estimates are used here. Total expenditures are estimated by fishing mode and residential status for years 2010, 2011, and 2012, plus the three-year average. In addition, estimates are made separately for trip-related expenditures and durable goods expenditures. Trip-related expenditures are made by fishing mode, while durable goods expenditures are made across all modes. Durable good expenditures are only estimated for residents, since non-residents are not likely to have made purchases within the California sanctuaries' study areas. Total expenditures are equal to person-days multiplied by expenditure per person-day and are converted to 2014 dollars for all years using the consumer price index (CPI). Gasoline expenditures were converted to 2014 dollars using the gasoline adjustment factor provided by the CPI to account for the increased volatility of prices relative to other goods and services (See Chen, Leeworthy and Schwarzmann 2015).

Table 3.1 shows how the percentage of trip-related expenditure by type has variation in both mode and residential status. For example, the percentage spent on auto-fuel by residential status does not vary much, but across modes of fishing the variation is greater. The shore fishermen spend a higher percentage of their total expenditures on auto fuel when compared to those who are using CPFVs. In regards to food purchases, residents spend a larger portion of their expenditures on grocery store purchases regardless of the mode of fishing. Alternatively, non-residents are spending a larger portion of their expenditures on food from restaurants when compared to residents of the sanctuary.

Table 3.1 Percent of Trip-related Expenditure by Fishing Mode

	Resident			Non-Resident		
	Shore	Private/Rental	CPFV	Shore	Private/Rental	CPFV
Auto Fuel	28.8%	23.8%	12.7%	30.0%	27.5%	13.4%
Auto Rental	-	-	0.3%	1.8%	6.9%	7.4%
Bait	18.8%	13.6%	2.2%	8.8%	5.2%	0.6%
Boat Fuel	-	28.5%	-	-	10.3%	-
Boat Rental	-	0.7%	-	-	1.2%	-
Charter Fees	-	-	51.3%	-	-	35.9%
Crew Tips	-		8.0%	-	-	3.5%
Fish Processing	-	-	0.1%	-	-	0.0%
Food from Grocery Stores	29.1%	16.9%	8.3%	14.2%	11.0%	6.8%
Food from Restaurants	9.9%	6.6%	7.9%	17.2%	11.3%	7.3%
Gifts & Souvenirs	1.6%	0.2%	0.9%	9.6%	2.3%	7.9%
Ice	2.4%	3.0%	1.1%	2.4%	1.5%	0.5%
Lodging	5.5%	1.4%	2.2%	14.6%	10.4%	8.8%
Parking & Site Access	3.7%	5.0%	1.9%	0.7%	1.8%	2.4%
Public Transportation	0.0%	0.0%	0.0%	0.9%	10.5%	4.5%
Tournament Fees	0.1%	0.3%	2.1%	0.1%	0.1%	0.5%

Shore Angler Trip-related Expenditures

Over the three-year period from 2010 to 2012, residents accounted for between 91 and 96% of all trip-related spending by those who access the California sanctuaries via shore modes of fishing. This is due mostly to the fact that residents account for a greater number of person-days of shore fishing. However, non-residents had higher total trip-related expenditures for shore fishing for auto rental and public transportation. Residents tend to spend a higher percentage of trip-related expenditures on food from grocery stores (29.6%) than non-residents (14.4%), while non-residents spend a larger portion of trip-related expenditure on food from restaurants (17.5%) than residents (10%) (Table 3.2).

Table 3.2 Shore Angler Annual Trip-related Expenditures, 2010-2012 (2014 Dollars)

	2010		*2011*		*2012*	
Shore	*Resident*	*Non-Resident*	*Resident*	*Non-Resident*	*Resident*	*Non-Resident*
Auto Fuel	$3,301,796	$325,789	$8,309,413	$369,078	$7,493,836	$513,545
Auto Rental	$0	$20,478	$0	$23,198	$0	$32,279
Bait	$2,284,344	$101,085	$5,748,834	$114,516	$5,184,592	$159,341
Fish Processing	$0	$0	$0	$0	$0	$0
Food from Grocery Stores	$3,538,222	$163,449	$8,904,373	$185,166	$8,030,419	$257,645
Food from Restaurants	$1,198,458	$198,074	$3,016,068	$224,392	$2,720,044	$312,226
Gifts & Souvenirs	$197,434	$110,951	$496,867	$125,693	$448,100	$174,894
Ice	$296,151	$27,179	$745,300	$30,791	$672,150	$42,843
Lodging	$666,772	$168,661	$1,678,015	$191,071	$1,513,319	$265,862
Parking & Site Access	$445,092	$7,633	$1,120,129	$8,647	$1,010,190	$12,031
Public Transportation	$0	$9,866	$0	$11,177	$0	$15,553
Tournament Fees	$15,587	$1,117	$39,226	$1,265	$35,376	$1,761
Total	$11,943,855	$1,134,282	$30,058,225	$1,284,995	$27,108,025	$1,787,979

Private/rental Boat Trip-related Expenditures

Over the three-year period 2010 to 2012, residents accounted 67 to 75% of all trip-related expenditures for those who accessed the California sanctuaries via private/rental boats for fishing. Again, this is mostly due to the greater number of person-days of fishing by residents. However, non-residents had greater total trip-related expenditures for auto rental, gifts & souvenirs, lodging and public transportation. Fuel expenditures are the largest portion of expenditures for both residents and non-residents (Table 3.3).

Table 3.3 Private/rental Boat Annual Trip-related Expenditures, 2010-2012 (2014 Dollars)

	2010		*2011*		*2012*	
Private/rental	*Resident*	*Non-Resident*	*Resident*	*Non-Resident*	*Resident*	*Non-Resident*
Auto Fuel	$2,706,143	$1,369,241	$3,905,033	$1,440,763	$5,213,562	$2,918,706
Auto Rental	$3,891	$364,540	$5,615	$383,580	$7,496	$777,061
Bait	$1,638,094	$274,922	$2,363,801	$289,281	$3,155,890	$586,029
Boat Fuel	$3,232,337	$513,498	$4,664,345	$540,320	$6,227,310	$1,094,584
Boat Rental	$86,574	$64,250	$124,928	$67,605	$166,790	$136,956
Charter Fees	$0	$0	$0	$0	$0	$0
Fish Processing	$0	$0	$0	$0	$0	$0
Food from Grocery Stores	$2,041,781	$580,176	$2,946,329	$610,479	$3,933,618	$1,236,714
Food from Restaurants	$793,756	$600,306	$1,145,405	$631,660	$1,529,220	$1,279,623
Gifts & Souvenirs	$21,400	$123,260	$30,881	$129,698	$41,229	$262,743
Ice	$358,941	$79,691	$517,959	$83,854	$691,522	$169,872
Lodging	$172,175	$548,741	$248,452	$577,402	$331,706	$1,169,706
Parking & Site Access	$598,235	$93,755	$863,265	$98,652	$1,152,537	$199,849
Public Transportation	$0	$555,083	$0	$584,075	$0	$1,183,225
Tournament Fees	$36,964	$6,894	$53,340	$7,254	$71,214	$14,695
Trip Total	$11,690,289	$5,174,356	$16,869,351	$5,444,623	$22,522,093	$11,029,764

Commercial Passenger Fishing Vessels Trip-related Expenditures

Unlike shore and private/rental boat modes of fishing, non-residents who accessed the California sanctuaries via CPFV had higher trip-related expenditures than residents. Over the three-year 2010 to 2012 period, non-residents accounted for between 58 and 63% of all trip-related expenditures. However, residents had higher trip-related expenditures for bait, crew tips and tournament fees.

CPFV expenditures are the only profiles with charter fees and crew tips. Although non-residents spend more total on charter fees, residents are spending more than 52% of their total expenditures on charter fees, while non-residents spent 36%. Residents spent roughly 8% of their total expenditures on crew tips compared to less than 4% for non-residents. Non-residents spent 12 to 15 times more than residents on gifts and souvenirs. Further they are spending five to seven times more on lodging than residents (Table 3.4).

Table 3.4 CPFV Annual Trip-related Expenditures, 2010-2012 (2014 Dollars)

	2010		2011		2012	
CPFV	Resident	Non-Resident	Resident	Non-Resident	Resident	Non-Resident
Auto Fuel	$1,164,467	$1,698,344	$1,469,684	$2,320,946	$1,783,672	$3,248,434
Auto Rental	$28,113	$993,465	$35,482	$1,357,656	$43,062	$1,900,202
Bait	$215,533	$74,934	$272,025	$102,403	$330,142	$143,326
Charter Fees	$4,988,050	$4,839,834	$6,295,433	$6,614,057	$7,640,429	$9,257,164
Crew Tips	$778,685	$477,406	$982,781	$652,416	$1,192,749	$913,135
Fish Processing	$4,909	$3,730	$6,195	$5,097	$7,519	$7,134
Food from Grocery Stores	$807,691	$916,157	$1,019,389	$1,252,009	$1,237,178	$1,752,337
Food from Restaurants	$764,406	$981,597	$964,759	$1,341,439	$1,170,876	$1,877,504
Gifts & Souvenirs	$89,248	$1,061,956	$112,640	$1,451,256	$136,705	$2,031,206
Ice	$102,189	$72,221	$128,972	$98,697	$156,527	$138,138
Lodging	$211,517	$1,178,934	$266,956	$1,611,116	$323,990	$2,254,950
Parking & Site Access	$183,404	$322,452	$231,475	$440,659	$280,928	$616,755
Public Transportation	$0	$608,285	$0	$831,275	$0	$1,163,469
Tournament Fees	$208,839	$68,830	$263,577	$94,063	$319,889	$131,652
Trip Total	$9,547,050	$13,298,146	$12,049,367	$18,173,090	$14,623,666	$25,435,406

Durable Good Expenditures

Durable good expenditures are only calculated for residents of the study area, since it is not likely that non-residents purchased these kinds of items in the study areas of each sanctuary. NMFS calculates the mean durable expenditures for all modes by participant. When estimating durable good expenditures they are not disaggregated by fishing mode, but presented as the expenditure value for all modes. We converted the mean durable good expenditures by participant to durable good expenditures by person-day. See Chen, Leeworthy and Schwarzmann (2015) for detailed methods of this approach.

Total durable good expenditures were relatively low in 2010, but rose significantly in 2011 and 2012. This is because there were more person-days of fishing in 2011 and 2012 than 2010. The highest spending categories were for rods & reels, durable tackle and boat storage. See **Error! Reference source not found.** for a more detailed breakdown of durable goods for the study period.

Table 3.5 Durable Goods Expenditures, 2010-2012 (2014 Dollars)

	2010	*2011*	*2012*
Durable Tackle	$6,564,792	$13,178,865	$13,518,281
Rods & Reels	$8,802,384	$17,670,847	$18,125,952
Spearfishing Gear	$0	$0	$0
Binoculars	$265,140	$532,271	$545,979
Camping Equipment	$774,867	$1,555,552	$1,595,614
Clothing	$2,211,558	$4,439,718	$4,554,061
Club Dues	$422,032	$847,232	$869,052
License Fees	$2,310,215	$4,637,772	$4,757,216
Magazine Subscriptions	$368,593	$739,953	$759,010
Taxidermy	$91,121	$182,925	$187,636
New Boat Purchase	$2,523,286	$5,065,515	$5,195,974
Used Boat Purchase	$162,373	$325,964	$334,359
New Canoe Purchase	$76,048	$152,667	$156,599
Used Canoe Purchase	$0	$0	$0
New Accessory Purchase	$1,449,023	$2,908,923	$2,983,841
Used Accessory Purchase	$0	$0	$0
Boat Insurance	$1,564,122	$3,139,986	$3,220,855
Boat Maintenance	$3,265,268	$6,555,048	$6,723,870
Boat Registration	$407,645	$818,349	$839,426
Boat Storage	$5,709,765	$11,462,394	$11,757,603
Boat Purchase Fees	$100,712	$202,180	$207,388
New Vehicle Purchase	$2,248,554	$4,513,988	$4,630,244
Used Vehicle Purchase	$2,209,502	$4,435,592	$4,549,828
Vehicle Insurance	$1,662,779	$3,338,041	$3,424,010
Vehicle Maintenance	$572,758	$1,149,815	$1,179,428
Vehicle Registration	$525,485	$1,054,914	$1,082,083
Vehicle Purchase Fees	$363,797	$730,325	$749,135
New Home Purchase	$278,158	$558,403	$572,785
Second Home Property Taxes	$3,426	$6,877	$7,054
Total	$44,933,402	$90,204,119	$92,527,284

Summary

Trip-related Expenditures. Total trip-expenditures have increased from 2010 to 2012. Additionally, total trip-expenditures have nearly doubled from 2010 to 2012 (Table 3.6). The three-year average was more than $79.7 million with CPFV accounting for the largest percentage of total trip-related expenditures.

Durable Good Expenditures. Total durable goods expenditures increased from 2010 through 2012. Additionally, total durable good expenditures have more than doubled from 2010 to 2012. The average total durable good expenditures for the study period were $75.9 million (Table 3.7).

Total Expenditures. Total expenditures followed the same patterns as trip-related and durable goods expenditures; increasing from 2010 through 2012. Total expenditures rose from $97.7 million in 2010 to more than $195.0 million in 2012. The three-year average was $155.6 million (Table 3.8). This information was used to estimate the economic impacts/ contributions associated with recreational fishing in California sanctuaries. The findings are presented in the following chapter.

Table 3.6 Trip-related Annual Expenditures by Mode of Access, 2010-2012 (2014 Dollars)

Mode of Access	2010	2011	2012	Average
Shore	$13,078,137	$31,343,220	$28,896,004	$24,439,121
Private/rental Boat	$16,864,645	$22,313,974	$33,551,857	$24,243,492
CPFV	$22,845,196	$30,222,457	$40,059,072	$31,042,242
Total	$52,787,979	$83,879,651	$102,506,932	$79,724,854

Table 3.7 Annual Durable Goods Expenditures by Mode of Access, 2010-2012 (2014 Dollars)

	2010	2011	2012	Average
Total	$44,933,402	$90,204,119	$92,527,284	$75,888,268

Table 3.8 Total Annual Expenditures by Expenditure Type, 2010-2012 (2014 Dollars)

Mode of Access	2010	2011	2012	Average
Trip-related	$52,787,979	$83,879,651	$102,506,932	$79,724,854
Durable Goods	$44,933,402	$90,204,119	$92,527,284	$75,888,268
Total	$97,721,381	$174,083,770	$195,034,216	$155,613,122

Chapter 4 Market Analysis of Recreational Fishing

Using the person-day estimates from Chapter 2 and the expenditures from Chapter 3, this data can be inputted to IMPLAN to estimate market benefits associated with recreational fishing in California sanctuaries by mode of fishing. First, it may be useful to discuss some IMPLAN terminology. Table 4.1 provides a more detailed explanation of the terminology used in this report, as defined by IMPLAN.

Table 4.1 IMPLAN Economic Indicators' Definitions

Indicator	*Definitions and Relationships*
Employment	Total annual average jobs. This includes self-employed and wage and salary employees, and all full-time, part-time and seasonal jobs, based on a count of full-time/part-time averages over twelve months
Labor Income	Defines the total value paid to local workers within a region. Labor income is the income source for induced household spending estimations. Labor Income = Employee Compensation + Proprietor Income
Value Added	Comprised of Labor Income, Indirect Business Taxes (IBT), and Other Property Type Income (OPTI), Value Added demonstrates an industry's value of production over the cost of its purchasing the goods and services required to make its products. Value Added is often referred to as Gross Regional Product (GRP). Value Added = Labor Income + IBT + OPTI
Output	The total value of an industry's production, comprised of the value of Intermediate Inputs and Value Added. In IMPLAN this is typically viewed as the value of a change in sales or the value of increased production. However, annual production is not always equal to annual sales. If production levels are higher than sales, surpluses become inventory. Because inventory does not drive additional impacts in the year it was produced, in IMPLAN Direct industry sales = Direct Output. Output = Intermediate Inputs + Value Added

Source: Day, 2011

Impacts are defined as direct, indirect or induced. In short, direct effects are those that occur within the sector of the expenditure. Indirect effects occur as a result of spending within the primary sector on goods and services from other sectors. Induced impacts result from the wage earners within the study area spending their money on goods and services within the region. The indirect plus induced make-up what is generally referred to as the "multiplier" effects. Table 4.2 explains these types of impacts in more detail.

Table 4.2 Impact Type Definitions

Type of Impact	*Definition*
Direct Effect	Reports the information entered into the Events field and the underlying regional relationships of the Sectors selected for the Event.
Indirect Effect	The result of a Sector purchasing goods and services to produce their product from other industries located within the study area.
Induced Effect	Results from spending of employee wages that stem from both the direct and indirect effects.

Source: Day, 2011

Economic Impacts/Contributions

The economic impacts/contributions are limited to the study areas of each sanctuary (see Chapter 1). For each of the estimates of impacts/contributions on employment and income from recreational fishing in California sanctuaries, we provide estimates of what proportion of the study area's total employment and income are accounted for by recreational fishing in California sanctuaries. Because the study area is very large, recreational fishing accounts for only fractions of a percent of the total study area's economy, however in absolute dollars the impacts/contributions are significant. Table 4.3 provides the estimates of the study area's employment and income for 2010 to 2012 and the three-year average.

The employment numbers presented here are the total full-time, part-time and seasonal jobs created each year within the study area. The percentages presented under Income and Employment are the percent of total income or employment that can be attributed to recreational fishing in the California sanctuaries study area (as defined in Chapter 1).

Table 4.3 Employment and Income in CA Study area

	2010	2011	2012	Average
Employment	19,808,693	20,182,463	20,653,860	20,215,005
Income	$1,579,148,473,000	$1,683,203,700,000	$1,768,039,281,000	$1,676,797,151,333

Source: Bureau of Economic Analysis

Total economic impacts/contributions steadily increased over the three-year period. In all three years of the study period, CPFV accounts for the largest impact on output to the economy. Tables 4.4 through 4.7 present the economic impacts/contributions of trip-related expenditures.

Table 4.4 2010 Trip-related Economic Impacts (2014 Dollars)[17]

2010				
	Output	Value Added	Income	Employment
Shore	$16,132,081	$9,906,878	$5,922,077	115
% of CA			0.000%	0.001%
Private/rental	$20,757,907	$12,503,783	$7,448,880	137
% of CA			0.000%	0.001%
CPFV	$35,272,391	$21,624,756	$13,037,588	305
% of CA			0.001%	0.002%
Total	$72,162,379	$44,035,417	$26,408,545	556
% of CA			0.002%	0.003%

Table 4.5 2011 Trip-related Economic Impacts (2014 Dollars) [18]

2011				
	Output	Value Added	Income	Employment
Shore	$39,730,947	$24,292,570	$14,501,504	277
% of CA			0.001%	0.001%
Private/rental	$29,802,325	$17,671,145	$10,469,923	186
% of CA			0.001%	0.001%
CPFV	$46,578,062	$28,558,213	$17,214,007	403
% of CA			0.001%	0.002%
Total	$116,111,334	$70,521,928	$42,185,434	866
% of CA			0.003%	0.004%

Table 4.6 2012 Trip-related Economic Impacts (2014 Dollars) [19]

2012				
	Output	Value Added	Income	Employment
Shore	$36,024,816	$22,086,215	$13,195,874	254
% of CA			0.001%	0.001%
Private/rental	$44,294,988	$26,315,425	$15,618,344	279
% of CA			0.001%	0.001%
CPFV	$61,435,366	$37,674,854	$22,697,898	534
% of CA			0.001%	0.003%
Total	$141,755,170	$86,076,494	$51,512,116	1,067
% of CA			0.003%	0.005%

[17] % of CA is the percent Income or Employment in the California study area (as defined by Table 1.1) that can be attributed to recreational fishing in California sanctuaries.
[18] % of CA is the percent Income or Employment in the California study area (as defined by Table 1.1) that can be attributed to recreational fishing in California sanctuaries.
[19] % of CA is the percent Income or Employment in the California study area (as defined by Table 1.1) that can be attributed to recreational fishing in California sanctuaries.

Table 4.7 Average Trip-related Economic Impacts from 2010-2012 (2014 Dollars) [20]

Average from 2010-2012				
	Output	Value Added	Income	Employment
Shore	$30,629,281	$18,761,888	$11,206,485	215
% of CA			0.001%	0.001%
Private/rental	$31,618,407	$18,830,118	$11,179,049	200
% of CA			0.001%	0.001%
CPFV	$47,761,940	$29,285,941	$17,649,831	414
% of CA			0.001%	0.002%
Total	$110,009,628	$66,877,946	$40,035,365	830
% of CA			0.002%	0.004%

Economic Impact/Contributions by Type of Expenditure

When analyzing the economic impacts of regulations and policy/management strategies, it is important to distinguish between trip-related expenditures and durable good expenditures, and their associated impacts/contributions on the local area economies. For small or marginal changes in fishing effort, it is not appropriate to include durable goods expenditures and their associated impacts/contributions on the local area economies. So here we provide a break-down of the economic impacts/contributions by these two types of expenditures. By normalizing these estimates by person-days of activity one can derive multipliers for regulatory or policy/management analyses. (See Chen, Leeworthy and Schwarzmann, 2015).

Trip-related expenditures from recreational fishing in California sanctuaries, on average, generated annual impacts/contributions of over $110.0 million in output, more than $66.9 million in value-added, $40.0 million in income, and roughly 800 full and part-time jobs (Table 4.8).

Table 4.8 Economic Impact of Annual Trip-related Expenditures, 2010-2012 (2014 Dollars) [21]

Measure	2010	2011	2012	Average
Output	$72,162,379	$116,111,334	$141,755,170	$110,009,628
Value Added	$44,035,417	$70,521,928	$86,076,494	$66,877,946
Labor Income	$26,408,545	$42,185,434	$51,512,116	$40,035,365
% of CA	0.002%	0.003%	0.003%	0.002%
Employment	556	866	1067	830
% of CA	0.003%	0.004%	0.005%	0.004%

[20] % of CA is the percent Income or Employment in the California study area (as defined by Table 1.1) that can be attributed to recreational fishing in California sanctuaries.
[21] % of CA is the percent Income or Employment in the California study area (as defined by Table 1.1) that can be attributed to recreational fishing in California sanctuaries.

Durable goods purchases, on average generated, on average, almost $103 million in output, more than $62 million in value added, more than $34.5 million in income and over 540 full and part-time jobs annually in California sanctuaries study area (Table 4.9).

Table 4.9 Economic Impact of Annual Durable Goods Expenditures, 2010-2012 (2014 Dollars) [22]

Measure	2010	2011	2012	Average
Output	$67,473,232	$119,384,620	$122,285,522	$103,047,791
Value Added	$41,733,652	$71,432,460	$73,094,702	$62,086,938
Labor Income	$24,100,606	$39,343,894	$40,246,612	$34,563,704
% of CA	0.002%	0.002%	0.002%	0.002%
Employment	379	621	638	546
% of CA	0.002%	0.003%	0.003%	0.003%

In total, recreational fishing in California sanctuaries, on average, generated annual impacts/contributions of $213.1 million in output, almost $129 million in value-added, almost $74.6 million in income, and more than 1,370 full and part-time jobs annually in the California sanctuaries study area (Table 4.10).

Table 4.10 Economic Impact of Annual Total Expenditures, 2010-2012 (2014 Dollars) [23]

Measure	2010	2011	2012	Average
Output	$139,635,611	$235,495,954	$264,040,692	$213,057,419
Value Added	$85,769,069	$141,954,388	$159,171,196	$128,964,884
Labor Income	$50,509,151	$81,529,328	$91,758,728	$74,599,069
% of CA	0.003%	0.005%	0.005%	0.004%
Employment	936	1,487	1,705	1,376
% of CA	0.005%	0.007%	0.008%	0.007%

[22] % of CA is the percent Income or Employment in the California study area (as defined by Table 1.1) that can be attributed to recreational fishing in California sanctuaries.
[23] % of CA is the percent Income or Employment in the California study area (as defined by Table 1.1) that can be attributed to recreational fishing in California sanctuaries.

Chapter 5 Conclusion

This report presents the results of the recreational fishing study completed for California's National Marine Sanctuaries from 2010 through 2012. In total California sanctuaries accounted for 13.4% of the total person-days of recreational fishing in California each year on average. Recreational shore fishing accounted for an average of 9.9% of person-days, private/rental boat 25.8% of person-days, and commercial fishing passenger boats 22.3% of person-days of in California each year of the study period.

Chapter 3 discussed expenditures. Fuel was one of the largest expenditure categories for anglers, regardless of their mode of fishing. If the angler was fishing using a private/rental boat, then fuel expenditures composed more than half of their total expenditures. Additionally, residents tended to spend a larger percentage of total expenditures on grocery store food when compared to non-residents. Residents had more total trip-related spending on shore and private/rental boat modes, but non-residents had higher trip-related expenditures for the CPFV mode of fishing. In all modes of fishing, non-residents had higher trip-related expenditures for auto rental and public transportation and for lodging in the private/rental boat mode of fishing. For durable goods purchases, the highest expenditures were for rods & reels, durable tackle and boat storage.

Lastly, Chapter 4 presented the economic impacts/contributions of recreational fishing in California sanctuaries. Although, employment and income compose a small percentage of total employment and income in the Study area, recreational fishing in California sanctuaries still has a positive impact on the economy of the study area. In total, recreational fishing adds roughly $213.1 million in economic output, $129.0 million in value-added, roughly $74.6 million in income; and more than 1,370 full- and part-time jobs to the study area annually.

Glossary of Terms

(adapted from RecFin, 2014 and Day, 2011)

Commercial Passenger Fishing Vessel (CPFV) –There are two categories. The first is a charter boat, which operates under charter for a specified price, time, etc. A party boat is a boat on which fishing space and privilege are provided for a fee per angler.

Durable Goods –Goods that do not quickly wear out and typically last for a long period of time, such as a boat.

Employment –The total annual average jobs. This includes the self-employed in addition to wage and salary employees, and all full-time, part-time and seasonal jobs, based on a count of full-time and part-time job averages over twelve months.

Intermediate Inputs -Goods and service required to create a product.

Labor Income – Is equivalent to employee compensation + proprietor (business owner) income.

Output –The total value of an industry's production, comprised of the value of intermediate inputs and value added.

Person-Days –The number of days (not trips) a person fishes.

Private-Rental Fishing –A private boat is defined as belonging to an individual; it is neither for rent nor for transporting paying passengers. A rental boat is defined as a boat that is rented without crew or a guide; it does not transport paying passengers.

Shore Mode Fishing –Fishing accessed on beaches, banks and man-made structures.

Trip-Related Expenditures – Expenditures on goods and services for specific trip, such as food or live bait.

Value Added –Value added demonstrates an industry's value of production over the cost of the goods and services required to make its products. Value Added is often referred to as Gross Regional Product.

References

Chen, Cheryl, Vernon R Leeworthy, Danielle Schwarzmann. 2015. Technical Appendix: Economic Impact of the Recreational Fisheries on Local County Economies in California National Marine Sanctuaries, 2010, 2011 and 2012. *Marine Sanctuaries Conservation Series ONMS- 20015-06. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Office of National Marine Sanctuaries, Silver Spring, MD. 168pp.*

Day, Francis. (2011). Principles of Impact Analysis & IMPLAN Applications. First Edition. MIG.

Lovell, Sabrina, Scott Steinback, and James Hilger. 2013. The Economic Contribution of Marine Angler Expenditures in the United States, 2011. U.S. Dep. Commerce, NOAA Tech. Memo. NMFS-F/SPO-134.

North American Industry Classification System (NAICS). < http://www.naics.com/search/>

RecFIN. (2014). Pacific States Marine Fisheries Commission. <http://www.recfin.org/>

United States Department of Commerce, Bureau of Economic Analysis (BEA). Regional Data – Personal Income & GDP. <http://bea.gov/iTable/iTable.cfm?reqid=70&step=1&isuri=1&acrdn=5#reqid=70&step=1&isuri=1>

United States Department of Labor. Bureau of Labor Statistics (BLS). < http://data.bls.gov/pdq/querytool.jsp?survey=cu>