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Economic Impact of the Recreational Fisheries on Local County Economies in the Channel Islands National Marine Sanctuary 2010, 2011 and 2012

U.S. Department of Commerce
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National Ocean Service
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Cover

A recreational fishing boat at Anacapa Island. Robert Schwemmer, West Coast Regional Maritime Heritage Coordinator.

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Abstract

This report estimates the economic impact or contribution of recreational fishing within the Channel Islands National Marine Sanctuary (CINMS). 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., private/rental boat and commercial passenger fishing vessels) from the State of California's Recreational Fishing Statistics Program and multiplying by NOAA's National Marine Fisheries Service's (NMFS or 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 three counties (study area) where most of the economic impact takes place. Economic impacts are estimated for 2010, 2011, 2012 and the 3-year average. Expenditure impacts are estimated separately for trip expenditures and durable good expenditures. Trip expenditure 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 3-year average for 2010 to 2012 finds the total economic impact/contribution from marine recreational fishing in CINMS to be more than $31.4 million in output, $18.7 million in value added, $11.0 million in income and more than 200 jobs. For the study period, the lowest levels of output, value added, income and jobs occurred in 2010. Annually, on average, CINMS accounted for 8.4% of the total person-days of marine recreational fishing from California Districts 1 and 2 and 1.3% of the entire State of California's total recreational fishing effort. Recreational private-rental boat fishing accounted for an average of 5.0% of person-days and commercial fishing passenger boats accounted for 11.5% of all person-days in Districts 1 and 2. Private-rental boat fishing in CINMS accounted for 2.5% and commercial passenger fishing vessels for 9.2% of the total State of California's fishing effort by mode of access.

Key Words

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

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Chapter 1 Introduction

This report is part of the Socioeconomic Research & Monitoring Program for Channel Islands National Marine Sanctuary (CINMS). 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 CINMS and the resulting economic impacts/contributions from 2010-2012. The data used to estimate the number of recreational fishing person-days in CINMS comes from the California Department of Fish and Wildlife (CDFW). The data are available from the Pacific RecFIN public web site or via written request to 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.

There is very little shore-mode fishing in CINMS, and it is not enough to be measurable in random surveys. 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 in effort estimation is to determine what counties should be included in the CINMS study area. A county was included in the study area if the sanctuary was adjacent to its full coastal boundary. Then, data from the American Community Survey (U.S. Department of Commerce, Bureau of the Census) were 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 area counties for the CINMS are Los Angeles, Santa Barbara, and Ventura County, listed in Table 1.1 below. Figure 1.1 presents the map of the study area and fishing block IDs that are included in the study area.
Additionally, the CDFW districts are also presented on the map. CDFW districts are used to geographically identify different regions along the coast. A more detailed description of this process can be found in Chen, Leeworthy and Schwarzmann (2015).

Table 1.1 The CINMS Study Area

County	*Coastal*
Los Angeles	Coastal
Santa Barbara	Coastal
Ventura	Coastal

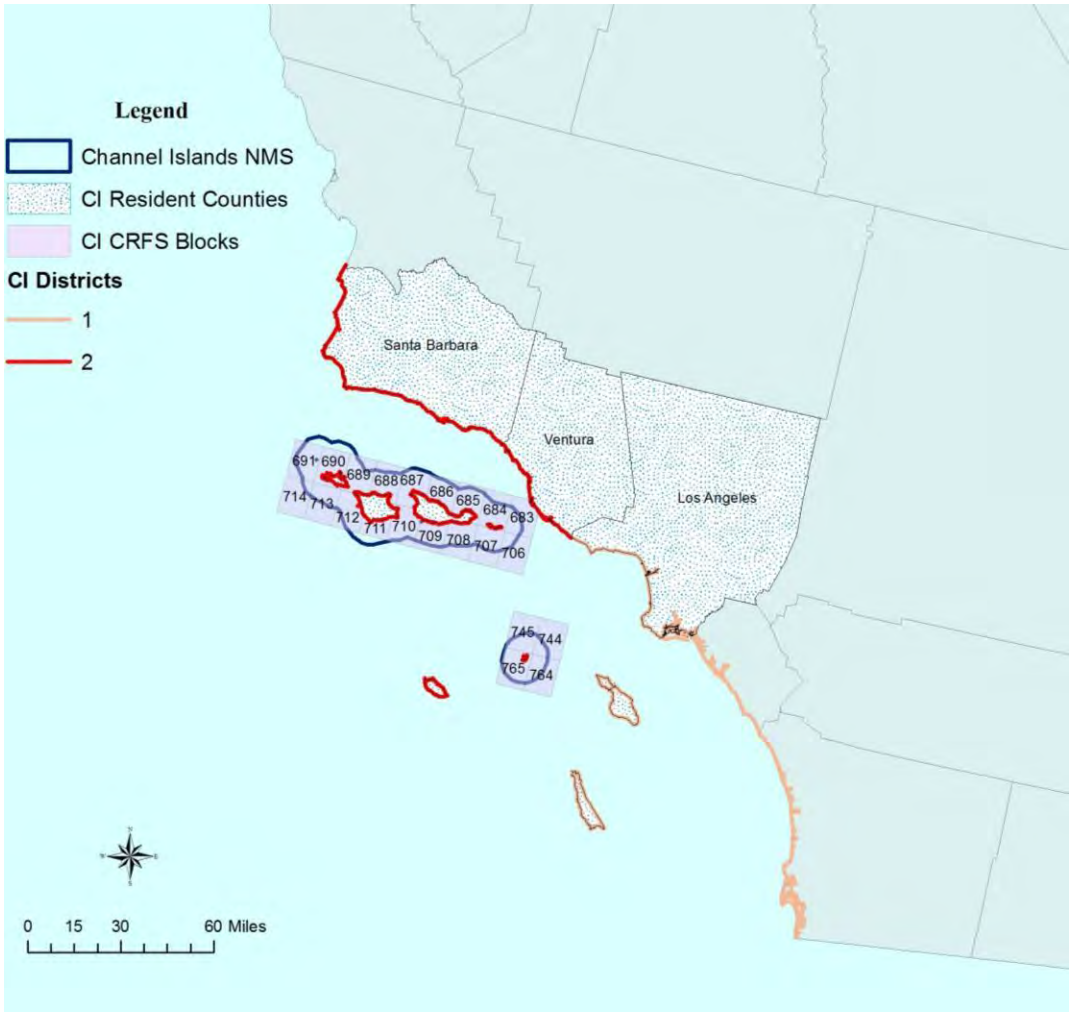

Figure 1.1 CINMS Study Area Map

Persons residing within the study area were considered residents, and persons residing outside of the three counties included in the study area were considered non-residents.

To estimate the economic impacts/contribution on the local counties of CINMS, CDFW data from years 2010-2012 were 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 of recreational fishing to the CINMS study area. 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 impacts/contributions of recreational fishing to the CINMS study area. 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 generally referred to as the "multiplier" impacts. For details on those impacts, see Chen, Leeworthy and Schwarzmann (2015).

Chapter 2 focuses on trends in person-days of recreational fishing within the sanctuary. For CINMS, two types of fishing were analyzed; private/rental boat and commercial passenger fishing vessels (CPFV). 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. Private boats are defined as boats belonging to an individual, not for rent or with paying passengers. Rental boat is defined as a boat that is rented without crew or a guide. The last section of Chapter 2 reviews CPFV. Two boat types fall into the CPFV category. The first is a charter boat, which operates under charter for a specified price, time, etc, and is usually 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 is often referred to as a head-boat (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
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

different types (modes) of recreational fishing and resident status. In addition, the annual expenditures on durable goods are also estimated.

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 3-year average.

Chapter 5 presents a summary and conclusions.

Chapter 2 Recreational Fishing Person-days

Private/rental Boat 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 that is counted as five person-days. Raw survey data were extrapolated from the CDFW, RecFIN web site and used to make population estimates of person-days in CINMS. 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 also include invertebrate recreational fishing person-day effort.

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. Figure 2.1 shows the number of person-days from 2004 to 2012.

For the 3-year period, 2010 to 2012, residents accounted for 80% of the person-days of private/rental boat fishing in CINMS. The average annual percentage was 91.3%. In 2011, residents accounted for 94.4% of the person-days of private/rental boat fishing in CINMS (Figure 2.2).

Person-days of private-rental boat fishing in CINMS, as a proportion of Districts 1 and 2 total person-days, ranged from a low of 2.8% in 2010 to a high of 6.5% in 2012, with a 3-year average of 5.0% (Table 2.2).

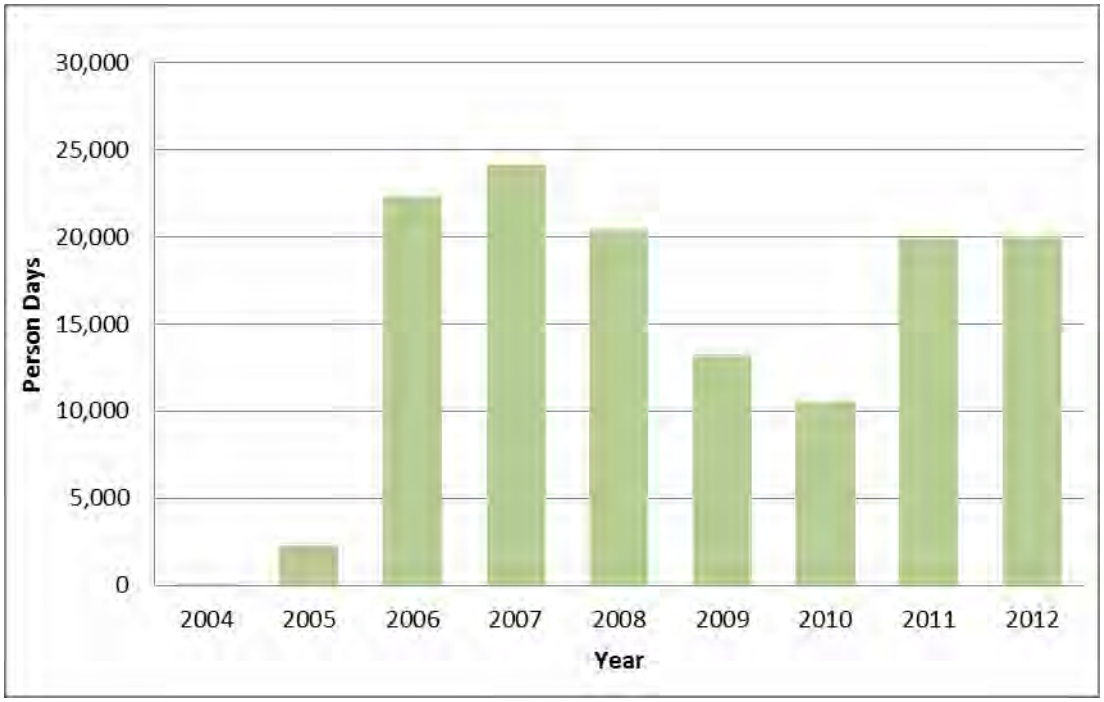

Figure 2.1 CINMS Private/rental Boat Fishing Person-days

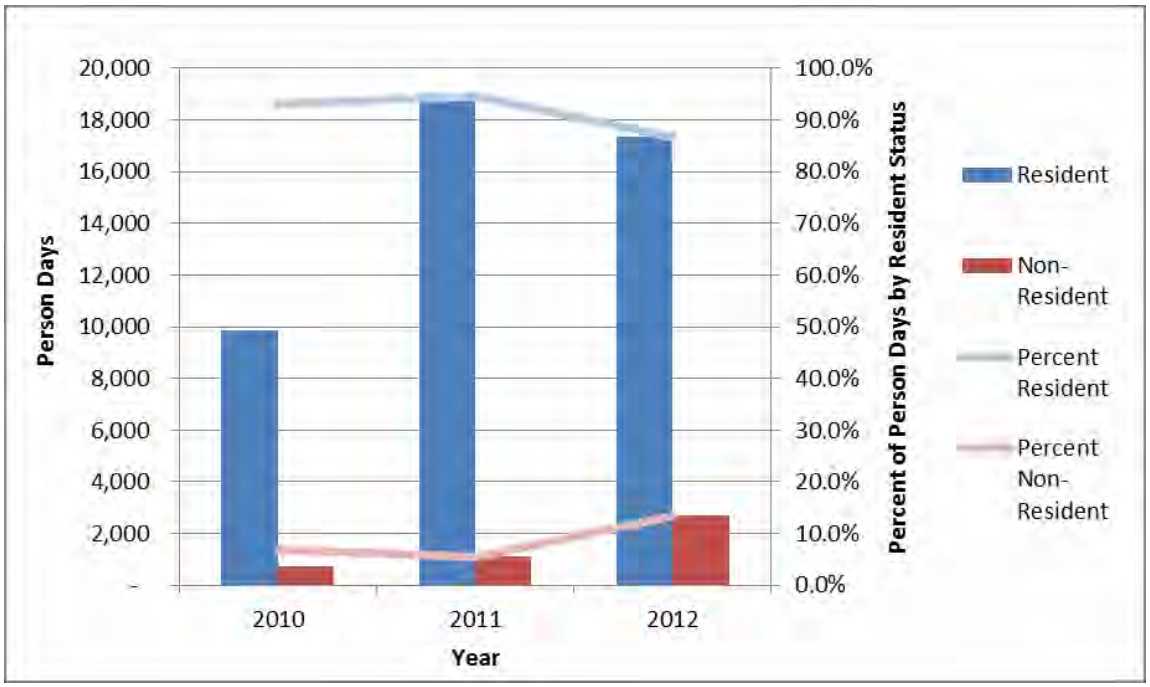

Figure 2.2 CINMS Private/rental Boat Fishing Person-days by Resident Status

Table 2.1 CINMS Private/rental Boat Fishing Person-days in Districts 1 and 2 by Resident Status

Year	Resident	Non-Resident	Total
2010	9,839	729	10,568
% in CINMS[1]			2.8%
2011	18,765	1,108	19,873
% in CINMS[2]			6.3%
2012	17,332	2,701	20,033
% in CINMS[3]			6.5%
Average	15,312	1,513	16,825
% in CINMS[4]			5.0%

Commercial Passenger Fishing Vessels – Person-days

From 2004 through 2012 the number of CPFV fishing person-days fluctuated, hitting a low in 2010. Since 2010, CPFV person-days have increased, reaching a high in 2012 (Figure 2.3).

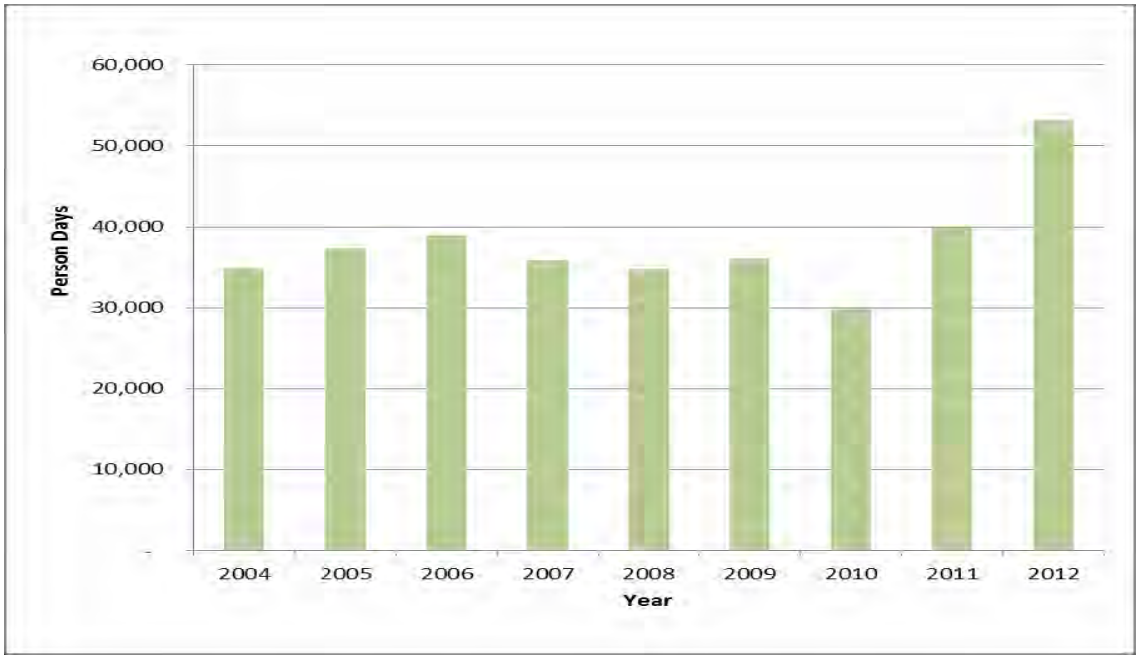

Figure 2.3 CINMS CPFV Fishing Person-days

[1] This is the 2010 number of total private-rental boating person-days in Districts 1 and 2. The value is 379,841 person-days.
[2] This is the 2011 number of total private-rental boating person-days in Districts 1 and 2. The value is 313,447 person-days.
[3] This is the 2012 number of total private-rental boating person-days in Districts 1 and 2. The value is 308,829 person-days.
[4] This is the average number of total private-rental boating person-days in years 2010, 2011 and 2012 in Districts 1 and 2. The value is 334,039 person-days.

Residents participated in a larger share of CPFV person-days when compared to non-residents. The total number of person-days for both residents and non-residents increased from 2010 to 2012. (Table 2.2 and Figure 2.4).

Table 2.2 CINMS CPFV Person-days in District 1 and 2 by Resident Status

Year	Resident	Non-Resident	Total
2010	22,996	6,838	29,834
% in CINMS[5]			13.9%
2011	30,933	8,993	39,926
% in CINMS[6]			8.9%
2012	38,582	14,554	53,136
% in CINMS[7]			13.1%
Average	30,837	10,128	40,965
% in CINMS[8]			11.5%

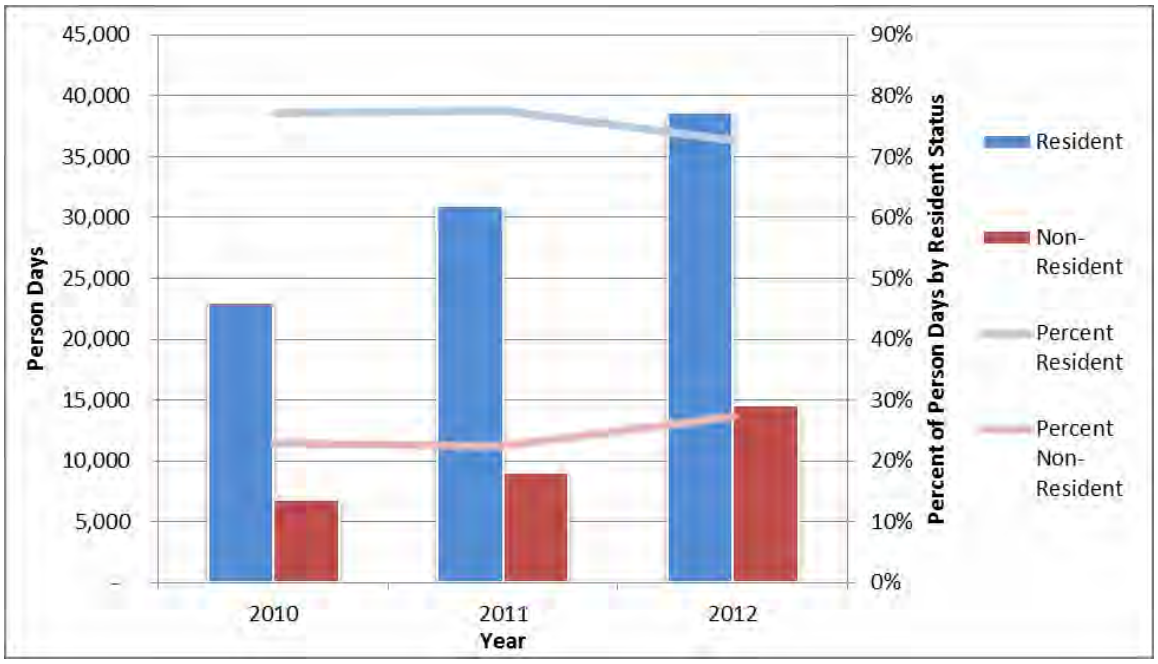

Figure 2.4 CINMS CPFV Fishing Person-days by Resident Status

[5] This is the 2010 number of total CPFV person-days in Districts 1 and 2. The value is 215,373 person-days. [6] This is the 2011 number of total CPFV person-days in Districts 1 and 2. The value is 446,808 person-days. [7] This is the 2012 number of total CPFV person-days in Districts 1 and 2. The value is 404,878 person-days. [8] This is the average number of total CPFV person-days in years 2010, 2011 and 2012 in Districts 1 and 2.
The value is 355,686 person-days.

Summary

On average, nearly one-tenth of total recreational fishing person-days that occurred in the Channel Islands Districts (1 and 2) occurred within CINMS (Table 2.2).

Table 2.3 CINMS Total Recreational Person-Days in Districts 1 and 2 by Fishing Mode and Year

Mode	2010	2011	2012	Average
Private/rental Boating	10,568	19,873	20,033	16,825
% in CINMS[9]	2.8%	6.3%	6.5%	5.0%
CPFV	29,834	39,926	53,136	40,965
% in CINMS[10]	13.9%	8.9%	13.1%	11.5%
Total of Both Modes	40,402	59,799	73,169	57,790
% in CINMS[11]	6.8%	7.9%	10.3%	8.4%

[9]The 2010 number of total private-rental person-days in Districts 1 and 2 is 379,841, 2011 had 313,447 person-days, 2012 had 308,829 person-days, and the average number across the study period of 2010 through 2012 is 334,039 person-days.

[10]The 2010 number of total CPFV person-days in Districts 1 and 2 is 215,373, 2011 had 446,808 person-days, 2012 had 404,878 person-days, and the average number across the study period of 2010 through 2012 is 355,686 person-days.

[11]The 2010 number of total recreational fishing person-days for private-rental and CPFV in Districts 1 and 2 is 595,214, 2011 had 760,255 person-days, 2012 had 713,707 person-days, and the average number across the study period of 2010 through 2012 is 689,725 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 3-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 CINMS study area. 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 varies 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 private/rental boat 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 CINMS study area.

Table 3.1 Percent of Trip-related Expenditure by Fishing Mode

	Residents		Non-Residents	
	Private/Rental	CPFV	Private/Rental	CPFV
Auto Fuel	23.8%	12.7%	27.5%	13.4%
Auto Rental	-	0.3%	6.9%	7.4%
Bait	13.6%	2.2%	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	16.9%	8.3%	11.0%	6.8%
Food from Restaurants	6.6%	7.9%	11.3%	7.3%
Gifts & Souvenirs	0.2%	0.9%	2.3%	7.9%
Ice	3.0%	1.1%	1.5%	0.5%
Lodging	1.4%	2.2%	10.4%	8.8%
Parking & Site Access	5.0%	1.9%	1.8%	2.4%
Public Transportation	0.0%	0.0%	10.5%	4.5%
Tournament Fees	0.3%	2.1%	0.1%	0.5%

Private/rental Boat Trip-related Expenditures

Over the 3-year period 2010 to 2012, residents accounted for between 80 and 90% of trip-related expenditures for those accessing CINMS via private/rental boat. This is largely driven by the greater number of person-days of fishing by residents. However, non-residents spent more money on auto rental, public transportation and gifts and souvenirs than residents.

Table 3.2 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	$289,442	$38,265	$552,000	$58,189	$509,845	$141,835
Auto Rental	$416	$10,188	$794	$15,492	$733	$37,761
Bait	$175,206	$7,683	$334,137	$11,683	$308,621	$28,478
Boat Fuel	$345,723	$14,350	$659,333	$21,822	$608,981	$53,191
Boat Rental	$9,260	$1,796	$17,659	$2,730	$16,311	$6,655
Charter Fees	$0	$0	$0	$0	$0	$0
Fish Processing	$0	$0	$0	$0	$0	$0
Food from Grocery Stores	$218,384	$16,214	$416,481	$24,656	$384,676	$60,098
Food from Restaurants	$84,898	$16,776	$161,910	$25,511	$149,545	$62,183
Gifts & Souvenirs	$2,289	$3,445	$4,365	$5,238	$4,032	$12,768
Ice	$38,391	$2,227	$73,217	$3,387	$67,625	$8,255
Lodging	$18,415	$15,335	$35,120	$23,320	$32,438	$56,842
Parking & Site Access	$63,986	$2,620	$122,028	$3,984	$112,709	$9,712
Public Transportation	$0	$15,512	$0	$23,589	$0	$57,499
Tournament Fees	$3,954	$193	$7,540	$293	$6,964	$714
Trip Total	$1,250,364	$144,604	$2,384,583	$219,895	$2,202,480	$535,993

Commercial Passenger Fishing Vessels Trip-related Expenditures

Over the 3-year period 2010 to 2012, residents accounted for about 65% of the trip-related expenditures for those accessing CINMS via the CPFV mode. This again is mostly driven by the greater number of total person-days of CPFV fishing by residents. However, non-residents had higher total expenditures on auto rental, gifts & souvenirs, lodging and public transportation than residents.

CPFV expenditures are the only profiles with charter fees and crew tips. Residents spent about 52% of their total expenditures on charter fees, while non-residents spent about 36%. Residents spent roughly 8% of their total expenditures on crew tips compared to less than 4% by non-residents (Table 3.3).

Table 3.3 CPFV Annual Trip-related Expenditures, 2010-2012 (2014 Dollars)

	2010		2011		2012	
CPFV	Resident	Non-Resident	Resident	Non-Resident	Resident	Non-Resident
Auto Fuel	$634,531	$362,177	$853,536	$476,327	$1,064,605	$770,840
Auto Rental	$15,319	$211,859	$20,606	$278,632	$25,702	$450,911
Bait	$117,446	$15,980	$157,982	$21,016	$197,049	$34,011
Charter Fees	$2,718,042	$1,032,109	$3,656,147	$1,357,402	$4,560,278	$2,196,689
Crew Tips	$424,314	$101,808	$570,762	$133,895	$711,906	$216,683
Fish Processing	$2,675	$795	$3,598	$1,046	$4,488	$1,693
Food from Grocery Stores	$440,119	$195,373	$592,022	$256,950	$738,424	$415,823
Food from Restaurants	$416,533	$209,328	$560,295	$275,303	$698,851	$445,524
Gifts & Souvenirs	$48,632	$226,465	$65,417	$297,841	$81,594	$481,997
Ice	$55,684	$15,401	$74,902	$20,255	$93,425	$32,780
Lodging	$115,258	$251,411	$155,038	$330,649	$193,377	$535,091
Parking & Site Access	$99,939	$68,764	$134,432	$90,436	$167,675	$146,354
Public Transportation	$0	$129,719	$0	$170,602	$0	$276,087
Tournament Fees	$113,799	$14,678	$153,075	$19,305	$190,930	$31,241
Trip Total	$5,202,290	$2,835,868	$6,997,813	$3,729,661	$8,728,304	$6,035,722

Durable Good Expenditures

Again, durable good expenditures are only calculated for residents of the study area, since non-residents are not likely to have made purchases in the CINMS study area. NMFS calculates the mean durable expenditures for all modes by participant. When estimating durable good expenditures, the expenditures 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 increased each year from 2010 through 2012, ranging from more than $4.9 million in 2010 to more than $8.4 million in 20102. The highest categories of spending were on durable tackle and rods and reels (Table 3.4).

Table 3.4 Durable Goods Expenditures, 2010-2012 (2014 Dollars)

	2010	*2011*	*2012*
Durable Tackle	$723,394	$1,094,884	$1,231,837
Rods & Reels	$969,960	$1,468,072	$1,651,706
Spearfishing Gear	$0	$0	$0
Binoculars	$29,217	$44,220	$49,752
Camping Equipment	$85,385	$129,233	$145,398
Clothing	$243,698	$368,846	$414,983
Club Dues	$46,505	$70,387	$79,191
License Fees	$254,569	$385,300	$433,496
Magazine Subscriptions	$40,616	$61,474	$69,164
Taxidermy	$10,041	$15,197	$17,098
New Boat Purchase	$278,048	$420,837	$473,477
Used Boat Purchase	$17,892	$27,081	$30,468
New Canoe Purchase	$8,380	$12,683	$14,270
Used Canoe Purchase	$0	$0	$0
New Accessory Purchase	$159,672	$241,670	$271,899
Used Accessory Purchase	$0	$0	$0
Boat Insurance	$172,355	$260,866	$293,497
Boat Maintenance	$359,809	$544,585	$612,705
Boat Registration	$44,920	$67,987	$76,492
Boat Storage	$629,176	$952,281	$1,071,397
Boat Purchase Fees	$11,098	$16,797	$18,898
New Vehicle Purchase	$247,775	$375,017	$421,925
Used Vehicle Purchase	$243,472	$368,503	$414,598
Vehicle Insurance	$183,227	$277,320	$312,009
Vehicle Maintenance	$63,114	$95,525	$107,474
Vehicle Registration	$57,905	$87,641	$98,604
Vehicle Purchase Fees	$40,088	$60,675	$68,264
New Home Purchase	$30,651	$46,391	$52,194
Second Home Property Taxes	$377	$571	$643
Total	$4,951,343	$7,494,046	$8,431,437

Summary

Trip-related Expenditures. Expenditures for both private/rental boat and CPFV have steadily increased from 2010 through 2012. The 3-year average across all modes was 13.4 million (Table 3.5). In each of the 3 years, CPFV fishing had the highest total trip-related expenditures, accounting for between 80 and 85% of trip-related expenditures.

Durable Good Expenditures. Total durable goods expenditures were roughly half of total trip-related expenditures. Over the 3-year period 2010 to 2012, durable goods expenditures accounted for between 32 and 36% of total expenditures. Total durable goods expenditures steadily increased over the 3-year period with a 3-year average of almost $7.0 million (Table 3.6).

Total Expenditures. Total expenditures followed the same patterns as trip-related and durable goods expenditures. Total expenditures rose from almost $14.4 million in 2010 to more than $25.9 million in 2012. The 3-year average was about $20.4 million (Table 3.7). This information is used to estimate the economic impacts/contribution associated with recreational fishing in CINMS. The findings are presented in the following chapter.

Table 3.5 Trip-related Annual Expenditures by Mode of Access, 2010-2012 (2014 Dollars)

Mode of Access	2010	2011	2012	Average
Private/rental Boat	$1,394,968	$2,604,478	$2,738,473	$2,245,973
CPFV	$8,038,158	$10,727,474	$14,764,025	$11,176,552
Total	$9,433,126	$13,331,952	$17,502,498	$13,422,525

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

	2010	2011	2012	Average
Total	$4,951,343	$7,494,046	$8,431,437	$6,958,942

Table 3.7 Total Annual Expenditures by Expenditure Type, 2010-2012 (2014 Dollars)

Mode of Access	2010	2011	2012	Average
Trip-related	$9,433,126	$13,331,952	$17,502,498	$13,422,525
Durable Goods	$4,951,343	$7,494,046	$8,431,437	$6,958,942
Total	$14,384,469	$20,825,998	$25,933,935	$20,381,467

Chapter 4 Market Analysis of Recreational Fishing

Using the person-day estimates from Chapter 2 and the expenditures from Chapter 3, data can be inputted to IMPLAN to estimate market benefits associated with recreational fishing in Channel Islands by mode of fishing. 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 12 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/contributions 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 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	The effect of spending by recreational fishermen at each business they purchase goods or services from within the study area.
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 within the study area.

Source: Day, 2011

Economic Impacts/Contributions

The economic impacts/contributions are limited to the study area defined by three local area counties (see Chapter 1). For each of the estimates of impacts/contributions on employment and income from recreational fishing in CINMS, we provide estimates of what proportion of the study area's total employment and income are accounted for by recreational fishing in CINMS. Because the study area is large, recreational fishing accounts for only fractions of a percent of the total study area's economy. However, the impacts are significant in absolute dollars. Table 4.3 provides the estimates of the study area's employment and income for 2010 to 2012 and the 3-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 CINMS study area (as defined in Table 1.1 and Figure 1.1).

Table 4.3 Employment and Income in CI study area

	2010	2011	2012	Average
Employment	6,097,118	6,230,645	6,358,142	6,228,635
Income	$459,484,242,000	$483,748,165,000	$504,555,495,000	$482,595,967,333

Source: Bureau of Economic Analysis

Total economic impacts/contributions steadily increased over the 3-year period. In 2010, CPFV accounts for the largest impact on output to the economy. The output of CPFV, when compared to the output of private-rental boating, accounts for more than 80% of the total output of recreational fishing within the CINMS study area in each of the 3 years of the study period. Tables 4.4 through 4.7 present the economic impacts/contributions of trip-related expenditures.

[14] % of CI is the percent Income or Employment in the Channel Islands study area (as defined by Table 1.1) that can be attributed to recreational fishing in Channel Islands National Marine Sanctuary.
[15] % of CI is the percent Income or Employment in the Channel Islands study area (as defined by Table 1.1) that can be attributed to recreational fishing in Channel Islands National Marine Sanctuary.

Table 4.4 2010 Trip-related Economic Impacts (2014 Dollars)[12]

2010				
	Output	Value Added	Income	Employment
Private/rental	$1,946,080	$1,145,460	$677,209	14
% of CI			0.0001%	0.0002%
CPFV	$13,295,223	$8,010,729	$4,830,079	121
% of CI			0.001%	0.002%
Total	$15,241,303	$9,156,189	$5,507,288	135
% of CI			0.001%	0.002%

Table 4.5 2011 Trip-related Economic Impacts (2014 Dollars) [13]

2011				
	Output	Value Added	Income	Employment
Private/rental	$4,322,249	$2,479,377	$1,453,027	27
% of CI			0.0003%	0.0004%
CPFV	$17,745,765	$10,692,437	$6,447,611	162
% of CI			0.001%	0.003%
Total	$22,068,014	$13,171,814	$7,900,638	189
% of CI			0.002%	0.003%

Table 4.6 2012 Trip-related Economic Impacts (2014 Dollars) [14]

2012				
	Output	Value Added	Income	Employment
Private/rental	$3,952,893	$2,287,602	$1,351,466	26
% of CI			0.0003%	0.0004%
CPFV	$24,384,153	$14,690,032	$8,848,451	222
% of CI			0.002%	0.003%
Total	$28,337,046	$16,977,634	$10,199,917	248
% of CI			0.002%	0.004%

[14] % of CI is the percent Income or Employment in the Channel Islands study area (as defined by Table 1.1) that can be attributed to recreational fishing in Channel Islands National Marine Sanctuary.
[15] % of CI is the percent Income or Employment in the Channel Islands study area (as defined by Table 1.1) that can be attributed to recreational fishing in Channel Islands National Marine Sanctuary.

Table 4.7 Average Trip-related Economic Impacts from 2010-2012 (2014 Dollars) [15]

Average from 2010-2012				
	Output	Value Added	Income	Employment
Private/rental	$3,407,074	$1,970,813	$1,160,567	22
% of CI			0.0002%	0.0004%
CPFV	$18,475,047	$11,131,066	$6,708,714	168
% of CI			0.001%	0.003%
Total	$21,882,121	$13,101,879	$7,869,281	191
% of CI			0.002%	0.003%

Economic Impact/Contribution 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 CINMS, on average, generated annual impacts of over $21.9 million in output, almost $13.1 million in value-added, more than $7.8 million in income, and 191 full and part-time jobs (Table 4.8).

[14] % of CI is the percent Income or Employment in the Channel Islands study area (as defined by Table 1.1) that can be attributed to recreational fishing in Channel Islands National Marine Sanctuary.
[15] % of CI is the percent Income or Employment in the Channel Islands study area (as defined by Table 1.1) that can be attributed to recreational fishing in Channel Islands National Marine Sanctuary.

Table 4.8 Economic Impact of Annual Trip-related Expenditures, 2010-2012 (2014 Dollars) [16]

Measure	2010	2011	2012	Average
Output	$15,241,303	$22,068,014	$28,337,046	$21,882,121
Value Added	$9,156,189	$13,171,814	$16,977,634	$13,101,879
Labor Income	$5,507,288	$7,900,638	$10,199,917	$7,869,281
% of CI	0.001%	0.002%	0.002%	0.002%
Employment	135	189	248	191
% of CI	0.002%	0.003%	0.004%	0.003%

Durable goods expenditures from recreational fishing in CINMS, on average, generated more almost $9.6 million in output, more than $5.6 million in value added, more than $3.1 million in income, and 53 full and part-time jobs (Table 4.9).

Table 4.9 Economic Impact of Annual Durable Goods Expenditures, 2010-2012 (2014 Dollars) [17]

Measure	2010	2011	2012	Average
Output	$6,803,334	$10,297,104	$11,585,115	$9,561,851
Value Added	$4,011,324	$6,071,291	$6,830,717	$5,637,777
Labor Income	$2,216,578	$3,354,875	$3,774,519	$3,115,324
% of CI	0.0005%	0.001%	0.001%	0.001%
Employment	38	57	64	53
% of CI	0.001%	0.001%	0.001%	0.001%

For all types of expenditures from recreational fishing in CINMS, on average, these expenditures generated more than $31.4 million in output, more than $18.7 million in value added, almost $11 million in income and 244 full and part-time jobs (Table 4.10).

Table 4.10 Economic Impact of Annual Total Expenditures, 2010-2012 (2014 Dollars) [18]

Measure	2010	2011	2012	Average
Output	$22,044,637	$32,365,118	$39,922,161	$31,443,972
Value Added	$13,167,513	$19,243,105	$23,808,351	$18,739,656
Labor Income	$7,723,866	$11,255,513	$13,974,436	$10,984,605
% of CI	0.002%	0.002%	0.003%	0.002%
Employment	173	246	313	244
% of CI	0.003%	0.004%	0.005%	0.004%

[16] % of CI is the percent Income or Employment in the Channel Islands study area (as defined by Table 1.1) that can be attributed to recreational fishing in Channel Islands National Marine Sanctuary.
[17] % of CI is the percent Income or Employment in the Channel Islands study area (as defined by Table 1.1) that can be attributed to recreational fishing in Channel Islands National Marine Sanctuary.
[18] % of CI is the percent Income or Employment in the Channel Islands study area (as defined by Table 1.1) that can be attributed to recreational fishing in Channel Islands National Marine Sanctuary.

Chapter 5 Conclusion

This report presents the results of the recreational fishing study completed for Channel Islands National Marine Sanctuary (CINMS) from 2010 through 2012. In total, CINMS accounted for 8.4% of the total person-days of marine recreational fishing from Districts 1 and 2, and 1.3% of the entire State of California's total marine recreational fishing effort. Recreational private-rental boating accounted for an average of 5.0%, and commercial fishing passenger boats accounted for 11.5% of all person-days in Districts 1 and 2. Private-boating in CINMS accounted for 2.5%, and commercial passenger fishing vessels for 9.2% of the total State of California's fishing effort by mode of access.

Chapter 3 discussed expenditures. Fuel was one of the largest expenditure categories for anglers, regardless of their mode of fishing. If the anglers fished 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, while non-residents tended to spend more on auto rental, lodging, public transportation and gifts & souvenirs.

Lastly, Chapter 4 presented the economic impacts/contributions of recreational fishing in CINMS. Although employment and income compose a small percentage of total employment and income in the study area, recreational fishing in CINMS still has a positive impact on the economy of the study area. In total, marine recreational fishing adds roughly $31.4 million in economic output; $18.7 million in value added; almost $11.0 million in income; and more than 200 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. 2014. 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- 2015-06. 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>