
**Regulatory Flexibility Analysis for the MPAs in Channel Islands National
Marine Sanctuary: A 10-year Review**

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Introduction

This document provides a detailed 10-year review and assessment of the net socioeconomic impacts of the regulations that created the Marine Protected Areas (MPAs) for Channel Islands National Marine Sanctuary (CINMS) required under the Regulatory Flexibility Act.¹

Background

The MPAs were designed in a process undertaken from 1999-2002. CINMS Sanctuary Advisory Council (SAC) created a working group (SAC-WG) called the Marine Reserve Working Group (MRWG) that had representation of all CINMS stakeholders. Stakeholders included representatives from the commercial fisheries, the recreational fisheries, non-consumptive recreation, environmental groups, scientists/researchers and agencies with management responsibilities. The MRWG was charged with developing a recommendation on a network of marine reserves (no-take areas) for CINMS Management. The MRWG was provided a physical science panel and a socioeconomic panel to provide information and tools to help design the regulatory alternative. During the process, the socioeconomic panel analyzed over 40 alternatives for the marine reserve network. Some areas were called “Marine Conservation Areas” and allowed some consumptive activities. The MRWG did not come to consensus on an alternative and the State of California and CINMS developed the final alternative adopted, which took into account many concerns of those potentially negatively affected. The goal was to achieve the ecological objectives, while minimizing socioeconomic impacts.

The State portions of the network of MPAs was finalized in 2003 by the State of California. The regulations for the Federal portions were not approved until 2007. Therefore, the Federal Regulatory Flexibility Act 10-year review was scheduled for 2017. However, the network was designed holistically for the State and Federal portions to achieve the ecological objectives based on the science, while minimizing socioeconomic impacts. In Leeworthy et al. (2005), a cumulative socioeconomic impact analysis was conducted and separate effects of the different portions were estimated. This analysis was used in the Initial and Final Regulatory Flexibility Act analyses done for the Federal portions of the reserves in 2007. However, the many factors that are important in determining what actually happens can only be analyzed for the entire network of MPAs. Therefore, in this 10-year assessment, the cumulative impacts of the State and Federal portions of the MPAs are evaluated.

In Leeworthy et al. (2005), a two-step analysis was conducted. In step 1, all activity displaced was counted as lost i.e. that the losses could not be mitigated or offset and people could not relocate their activities outside of the MPAs. The losses were labelled “maximum potential loss”. These losses tended to be quantitative. In step 2, the many factors that affect each activity were evaluated and a qualitative conclusion was reached on how likely the “maximum potential losses” were to occur.

Benefits and costs of the regulations are by their nature highly uncertain because they are projections of the future states of the world. For the application to the MPAs, one has to deal

¹ We would like to thank two peer reviewers for comments and suggestions.

with uncertainties of how the natural system and human system respond. Determination of the net effect is highly uncertain. The National Science Foundation (NSF) has recommended in the face of uncertainty to undertake monitoring to determine what actually happens and based on that, engage in adaptive management.

Below the application of monitoring will be discussed for three efforts. First, the California Department of Fish and Game (DFG), now the Department of Fish and Wildlife (DFW) conducted a five-year assessment of the State MPAs. This was done for the period 2000-2003 pre-implementation and 2004-2008 post implementation. Second, the DFG/DFW did a 10-year ecological assessment of the MPAs including the entire State and Federal portions. Third, ONMS conducted socioeconomic studies of the commercial and recreational fisheries. For the commercial fisheries 2000-2002 pre-implementation was compared with the 2003-2012 post-implementation period. For recreational fishing, data was not available for the same pre-implementation and post-implementation periods. DFW took over the recreational fishing statistics program from NOAA Fisheries in 2003-04, and in the first couple of years (2004 and 2005), the data for CINMS had some problems. Therefore, the post-implementation monitoring was limited to 2006 to 2012.

The assessment provided here first reviews step 1 projections of “maximum potential loss” for the commercial and recreational fisheries. For non-consumptive recreation, projections of the potential benefits are presented. Then the pre-post implementation comparisons are discussed. Here step 2 factors included in the Leeworthy et al. (2005) are discussed and supplemented by other factors that help explain our conclusions.

Five-year Assessment of the State Portions of the MPAs

Commercial fisheries

DFG/DFW conducted a pre-post implementation using data on five years before implementation of the State portions of the MPAs as found in Leeworthy and Wiley (2003), which estimated “maximum potential loss” (DFG 2008). Comparisons were then made with data for five years post implementation. Seven species/species groups were selected for the assessment using logbook data from the commercial fishers. The seven species/species groups were rock crab, spiny lobster, market squid, sea urchins, sea cucumbers, rockfish, and CA sheephead. The summary analysis did not present the actual numbers, but instead produced a bar chart showing the predicted changes from Leeworthy and Wiley (2003) for the CINMS, the actual changes for the post-implementation period for the CINMS and the State of California (CA).

For four of the seven species/species groups (rock crab, spiny lobster market squid and sea urchin, the losses did not occur. Instead, there were increases in the harvest values. For one species, sea cucumbers, there was a loss but less than projected and less than the decrease statewide. For CA sheephead and rockfish, the actual losses were greater than projected and greater than the statewide declines. CA sheephead and rockfish only made up 0.85% and 0.84% respectively of the total harvest value of commercial catch in CINMS pre-implementation, while sea cucumbers accounted for 1.22%. Thus, the fisheries that declined only amounted to a small percent of CINMS fisheries. Therefore, even in the short-term (first five years post-implementation), little to no losses actually occurred. Further, DFG concluded that the results pre to post implementation of the MPAs was not attributed to the MPAs but other factors including other fishery regulations, environmental changes, and market forces. All of these were discussed in step 2 of the analysis in Leeworthy et al. (2005), which came to the same qualitative conclusion. This will be discussed in more detail in the 10-year assessment below.

Recreational fisheries

DFG/DFW looked at fishing effort for the Commercial Passenger Fishing Vessels (CPFV) or charter/party boat operations in Leeworthy and Wiley (2003) and Leeworthy et al. (2005). CPFV are ‘for hire’ operations that take people out for recreational fishing for a price. For the pre-implementation period, 1998-2002 was used, while 2003 – 2007 was used for the post-implementation period. CPFV trips declined pre-implementation reaching its lowest point in 2003. CPFV trips then increased in 2004 and were flat from 2004 to 2007. Therefore again, the conclusion was there was little to no losses in the recreational fisheries.

Non-consumptive recreation

There are no institutions that collect use information for non-consumptive recreation. This is done on an as needed basis in one-off projects. In the 1999 MRWG process, data was compiled on use by the for-hire operations (charter/party/guide boats) that take people out for consumptive and non-consumptive recreation. There were 51 operations in total and 26 operations took people out for non-consumptive recreation (Leeworthy and Wiley, 2003 and Leeworthy et al., 2005). In 2006, as part of the Socioeconomic Research & Monitoring Plan for the CINMS, a

study was conducted on those accessing CINMS via private boats (LaFranchi and Pendleton (2008). Many did consumptive and non-consumptive activities. The DFG/DFW reported some of the activity from the private boats in their five-year assessment, but there was no time series data available to do a pre-post analysis of the implementation of the State MPAs.

DFG did report time-series data pre to post implementation on the number of boats observed and their change in number and spatial distribution using CINMS Sanctuary Aerial Monitoring and Spatial Analysis Program (SAMSAP) for years between 1997 and 2006. In SAMSAP, observers are able to distinguish between commercial fishing vessels, recreational fishing boats and non-consumptive recreational boats. SAMSAP conducted 175 days of surveying over this period, 97 before implementation and 78 post-implementation. The finding was the number of boats did not change but there was a change in the spatial distribution with more use in the Scorpion Marine Reserve along the northwestern shore of Santa Cruz Island and near Anacapa Island near the MPAs located there. Therefore, there were most likely benefits received by individuals in the form of consumer's surplus (net economic user value) as projected in Leeworthy et al. (2005), but not the projected benefits to local businesses in increased business and profits during the short-term five-year assessment.

10-year Assessment of the State and Federal Portions of the MPAs

Ecological Assessment

2013 marked the ten-year anniversary of the CINMS MPAs so the Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO) evaluated the ecological goals of the MPAs using ten years of monitoring data on the rocky reefs and kelp forest communities (PISCO 2014).

Monitoring showed an increase in both greater density (number of fish per area) and biomass (total weight per area) inside MPAs compared to outside reference areas. The average biomass of fish targeted by the commercial and recreational fisheries, such as rockfish, increased both inside and outside MPAs but the increase was much larger inside MPAs. Invertebrate species receiving high fishing pressure, such as, spiny lobster, sea cucumbers and sea urchins were more abundant in the MPAs.

The scientists concluded that the increase in targeted fish species outside MPAs suggested that shifting fishing effort has not overtaxed fish species in open areas near MPA boundaries. This was a concern expressed in Leeworthy and Wiley (2002) and Leeworthy et al. (2005) that displaced fishing effort could result in fish catch declines in the remaining open areas due to overfishing making projections of “maximum potential loss” underestimates of the actual impacts. This apparently did not occur.

The PISCO scientists also concluded that scientists are still working to understand whether the increase is related to changes in fishing patterns and MPAs, fish spilling over from MPAs to fished areas outside the MPAs, changes in ocean conditions, or a combination of these factors. We will give this more attention in the socioeconomic assessment.

A recent study McClatchie et al. (2017) studied the 500-year paleo-record of biomass of forage fish (anchovy, sardine and hake) in the southern California Current System (CSS). They found large fluctuations in biomass and lengthy recovery times from natural events. They uncovered boom and bust cycles with varying rates of recovery. They also added that although “reserve thresholds” cannot prevent collapses from occurring, “well designed reserve thresholds” and harvest rates would help protect the fishery and predators in the long term. Therefore, the MPAs should have a positive long-term effect on the Wetfish fishery, the benefits to other commercial and recreational fisheries, and the marine mammals and sea birds that support the non-consumptive recreation.

Socioeconomic Assessment

ONMS conducted studies of the commercial fisheries (Leeworthy et al. 2014) and the recreational fisheries (Leeworthy and Schwarzmann, 2015) for CINMS fulfilling needs expressed in the Socioeconomic Research & Monitoring Plan for CINMS and the West Coast Region Socioeconomic Research & Monitoring Plan (ONMS 2013). In 2012-2013, a University of California, Santa Barbara Bren School Project (Gornick et al. 2013) on the economic value of recreation use by those accessing CINMS from private boats was completed using the survey data obtained in the study by (Pendleton and LaFranchi, 2008). Estimates of non-consumptive recreational use via private boats was estimated using CINMS SAMSAP (Leeworthy 2013) to

aggregate sample to population estimates for the Bren School Project. For baseline estimates of socioeconomic impacts, projections of the impacts of the MPAs and discussions of other factors, information is summarized here from Leeworthy et al. 2005. This discussion is then extended to additional factors that have emerged that influence the outcomes post-implementation of the MPAs.

Commercial fisheries

For the pre-post implementation period changes in harvest pounds and harvest value (what the fishermen receive in revenue from their catch in CINMS), we use the estimates found in Leeworthy et al. (2014). In this study, the pre-implementation period was 2000-2002 and the post-implementation period was 2003-2012. We also focus on the seven species/species groups assessed by the DFG/DFW in the five-year assessment and add two important fisheries (Prawn & Shrimp and Wetfish (anchovies & sardines). In addition, we add the total for all commercial fisheries in CINMS.

Seven Species/Species Groups Monitored in five-year Assessment

- Pounds: 5 of 7 declined pre to post implementation
- Value: 4 of 7 increased pre to post implementation, 2 declined (Rockfish and CA sheephead) and 1 (urchin) was flat (Table 1).
- The sum of the value all seven species/species groups increased pre to post implementation of the MPAs. See Leeworthy et al. (2014) for detailed tables and figures by species/species groups' pre and post implementation of the MPAs.

As in the five-year assessment, CA sheephead and Rockfish accounted for a small share of the total value of the catch. CA sheephead accounted for 0.85% pre-implementation and 0.33% post-implementation. Rockfish accounted for 0.84% pre-implementation and 0.85% post-implementation. Thus, the two species/species groups that declined had little impact.

All Commercial Species

Wetfish and Prawn & Shrimp were ranked numbers 4 and 9 respectively pre-implementation of the MPAs. Prawn & shrimp both declined pre to post implementation in both pounds and value (Table 1). However, for all the commercial fisheries value increased pre to post implementation of the MPAs.

In Leeworthy et al. (2005), it was projected under “maximum potential loss” that the commercial fisheries would lose 12.5% of value of catch. However, it was concluded in step 2 of the analysis that those losses were not likely to occur. Under the Marine Life Management Act (MLMA), the open access fisheries and excess capacity that had led to overfishing was and is being addressed. The Asian markets for CINMS seafood has increased, especially for Spiny lobsters as pre-implementation demand was primarily for frozen tails and now a considerable portion of the catch is sold live for a much higher price per pound. The declines in pounds of Market Squid and Wetfish are partly due to new efforts to include ecosystem-based management in fishery management and the impacts of the new fishery management plans designed to reduce capacity in these fisheries. These two forage fish species/species groups have been reduced

through allocations to other fish species, marine mammals and sea birds that depend on these species for food.

In Leeworthy et al. (2005), profiles of the commercial fishing operations revealed that these operations were engaged in multiple-species fisheries with some depending on up to five species usually spread over different seasons. In 2003, there were 441 commercial fishing operations fishing in CINMS. Of those operations, 102 or 23% (that caught \$50,000 or more) accounted for 78% of harvest revenue. 266 or 60% (that caught less than \$20,000) accounted for 7.24% of all harvest revenue and 90 operations or 20.4% (that caught less than \$1,000) accounted for 0.22% of all harvest revenue. In 2012, there were only 240 operations fishing in CINMS because of the reductions in capacity in the fishery management plans. Many of the operations no longer operating were not dependent for their livelihoods on CINMS for their commercial catch. The fisheries have consolidated with the many part-time fishermen removed from the fisheries.

In 2003, 15.2% of the fishing operations depended on CINMS for 100% of their catch and 18.3% depended on CINMS for 5% or less of their catch. The 441 operations received only 47.68% of their total commercial fishing revenues from catch in CINMS. Thus, dependency on CINMS for their livelihoods was limited. It also demonstrates that fishermen had knowledge of other fishing grounds and the ability to relocate to other areas both inside and outside CINMS.

Conclusion: With a lower number of fishing operations and increased total revenue, revenue per fishing operation increased from \$48,609 pre-implementation to \$110,217 post implementation. In addition, although detailed costs-and-earnings data is not available pre to post implementation, we would expect, with the more efficient use of capital and labor, that profits per fishing operation increased pre to post-implementation of the MPAs. Therefore, we conclude there were no negative impacts as projected in step 1 of the analysis in Leeworthy et al. (2005) and instead there was a possible gain. As in the five-year assessment, this conclusion is primarily due to other factors with the difference being that the ecological assessment suggests some of the gain is attributable to the MPAs.

Table 1. Pre-Post Implementation of MPAs in CINMS: Commercial Fisheries

Species/Species Group	Pre-implementation 2000-2002		Post-implementation 2003-2012		Pounds Pre to Post + or -	Value Pre to Post + or -
	Average		Average			
	Average Pounds	Harvest Value (2013\$)	Average Pounds	Harvest Value (2013\$)		
Market Squid	85,896,990	11,326,160	54,521,864	16,169,627	-	+
Urchin	3,537,889	4,275,709	6,429,253	4,227,386	+	-
Spiny Lobster	162,089	1,455,451	152,358	1,936,039	-	+
Crab	372,460	637,709	502,510	786,561	+	+
Rockfish	59,446	281,770	33,302	149,486	-	-
Sea Cucumbers	299,519	377,549	218,535	441,050	-	+
CA Sheephead	50,494	213,413	17,586	80,149	-	-
Total Monitored ¹	90,378,887	18,567,761	61,875,408	23,790,298	-	+
Prawn & Shrimp	118,136	864,384	44,461	540,074	-	-
Wetfish (Anchovy-Sardines)	15,154,828	1,076,138	6,318,920	1,024,617	-	-
All Species	106,389,405	21,436,660	69,052,874	26,452,017	-	+

1. For first five-year monitoring, CA Dept. of Fish and Game (DFG) monitored seven species using logbook data. The same seven species are used for the 10-year post implementation period.

Recreational fisheries

Leeworthy et al. (2005) estimated the baseline for recreational fishing pre-implementation in 1999 based on surveys conducted in 2000. This information was put in a decision-support tool that was used in the MRWG process in assessing different spatial alternatives for the network of MPAs in the CINMS. In 1999, it was estimated there were 448,054 person-days of recreational fishing with 186,849 person-days via access through charter/party boats (CPFV boats in DFG/DFW data) and 261,205 person-days via access by private/rental boats. There were 25 operations with total revenue of almost \$9.4 million (2003\$) and a little over \$524 thousand in profits. In addition, with total spending by the anglers, the total impact on the three-county local area economy of Los Angeles, Ventura and Santa Barbara, including multiplier impacts, was \$26.4 million in income and 1,138 jobs (Table 2).

Table 2. Baseline Recreational Fishing in the CINMS 1999 in 2003 \$

Measure	Charter/Party Boat	Private/Rental Boat	Total
Person-days	186,849	261,205	448,054
Number of Operators	25	n/a	
Revenue ¹	\$9,496,133	n/a	
Profit	\$524,169	n/a	
Income ²	\$13,687,771	\$12,728,786	\$26,416,557
Jobs ³	676	462	1,138

1. Revenue for Charter/Party boat operations.

2. Income includes multiplier impacts on local area economy.

3. Number of full and part-time jobs and includes multiplier impacts on local area economy.

Source: Leeworthy et al. 2005

Leeworthy et al. (2005) also estimated the projected impacts post-implementation of the MPAs in the CINMS. As with the commercial fisheries, the quantitative information was based on step 1 analysis that estimated “maximum potential loss”. For the alternative adopted, it was estimated that 84,017 person-days of activity would be potentially impacted (18.8% of the use). For the 25 charter/party boat operations, the estimate was 33,132 person-days (17.7% of the use), while for those accessing the CINMS via private/rental boats 50,885 person-days were potentially lost (19.5% of the use). For the 25 charter/party operations, a little more than \$92 thousand in profits would be potentially lost. Accounting for the spending impacts by the anglers, the potential impact on the local three-county economy was estimated at \$4.66 million in income and 199 jobs (Table 3).

Table 3. Projected Impacts on Recreational Fishing Post-Implementation of the MPAs in the CINMS (2003 \$)

Measure	Charter/Party Boat	Private/Rental Boat	Total	Percent Impacted
Person-days	33,132	50,885	84,017	18.80%
Number of Operators	25	n/a		
Profit	\$92,026	n/a		17.60%
Income ¹	\$2,253,790	\$2,409,234	\$4,663,024	17.60%
Jobs ²	112	87	199	17.50%

1. Income includes multiplier impacts on local area economy.

2. Number of full and part-time jobs and includes multiplier impacts on local area economy.

Source: Leeworthy et al. 2005

Chen, Leeworthy and Schwarzmann (2015) is the technical appendix with more detailed estimates and explanation for the results summarized in Leeworthy and Schwarzmann (2015) for the study on the economic contribution of the recreational fisheries for years 2010 to 2012. In this study, estimates of recreational fishing use were updated using the recreational fishing data from the DFW for years 2004 to 2012 (post implementation of the CINMS MPAs). As noted above, the DFW data for the private/rental boat component was less reliable for years 2004 and 2005 because of the new effort taken over by DFW from NOAA Fisheries. The CPFV data were more reliable for these years since logbook data was available.

Conclusion: The CPFV data shows that for the 2004 to 2012 period CPFV person-days of use in CINMS was stable with some minor dips in the 2008-2010 recession, but were on a strong upward trend post-recession in 2011 and 2012 (Figure 1). The number of CPFV operations taking people out for recreational fishing varied from 58 in 2004 to 52 in 2012. This was twice the number identified in 1999. CPFV person-days in CINMS accounted for 4.85% of total State of CA CPFV person-days in 2004 and 10.83% in 2012. The trends statewide (Figure 2) show that the CINMS CPFV person-days were much more stable and showed less of a decline from 2005 to 2006 and remained closer to the pre-2006 levels over the 2006 – 2010 period and did not increased faster post-recession than the statewide numbers. Thus, CPFV data suggest, as in the five-year assessment, that there was no negative impact from the MPAs on this segment of the recreational fishing industry and a possible positive impact.

For the private/rental boat component of recreational fishing in the CINMS from 2006 to 2012, person-days reached a peak in 2007 before the recession and steadily declined during the 2008-2010 recession, then recovered in the 2011 and 2012 post recession period (Figure 3). Further, the baseline 1999 estimates of private/rental boat fishing in the CINMS was based on an experimental program and the new revised program reveals that the baseline 1999 numbers

estimated were grossly overestimated and the potential impact of the closed areas overestimated, so pre-post comparisons based on the 1999 numbers is not reliable. The trends statewide (Figure 4) are similar to those in the CINMS over the 2005 to 2012 period with market forces (recession of 2008 to 2010) being the dominant factor. As with the CPFV portion of the industry, there appears to be no negative impacts from the MPAs and potentially some positive impacts.

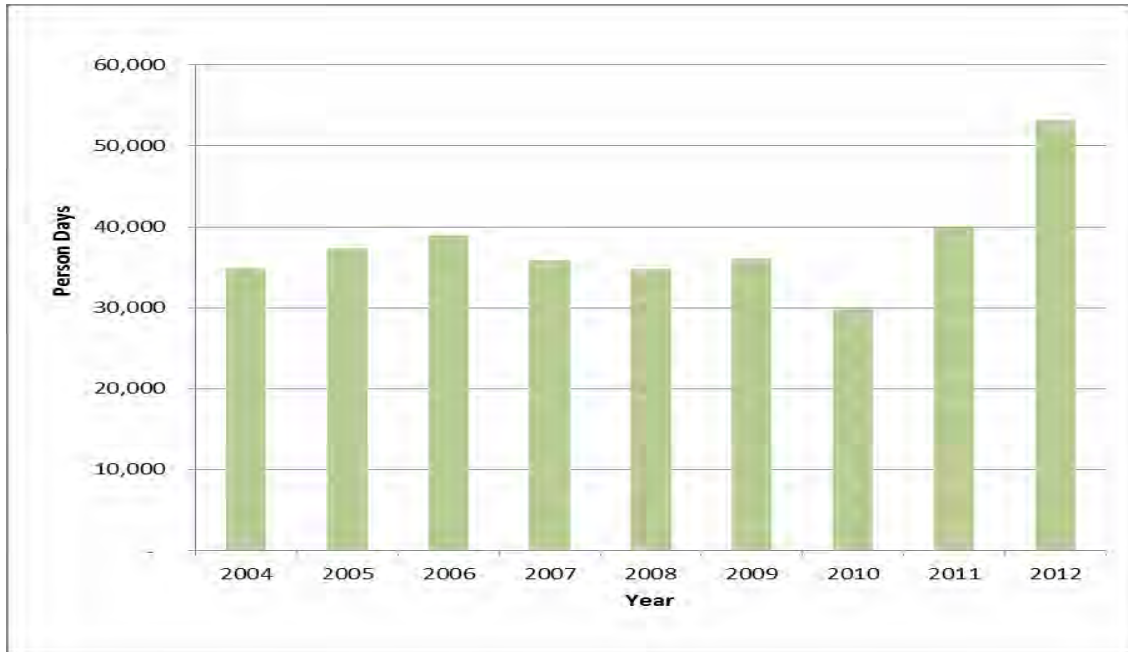


Figure 1 CPFV Person-days in the CINMS 2004 to 2012

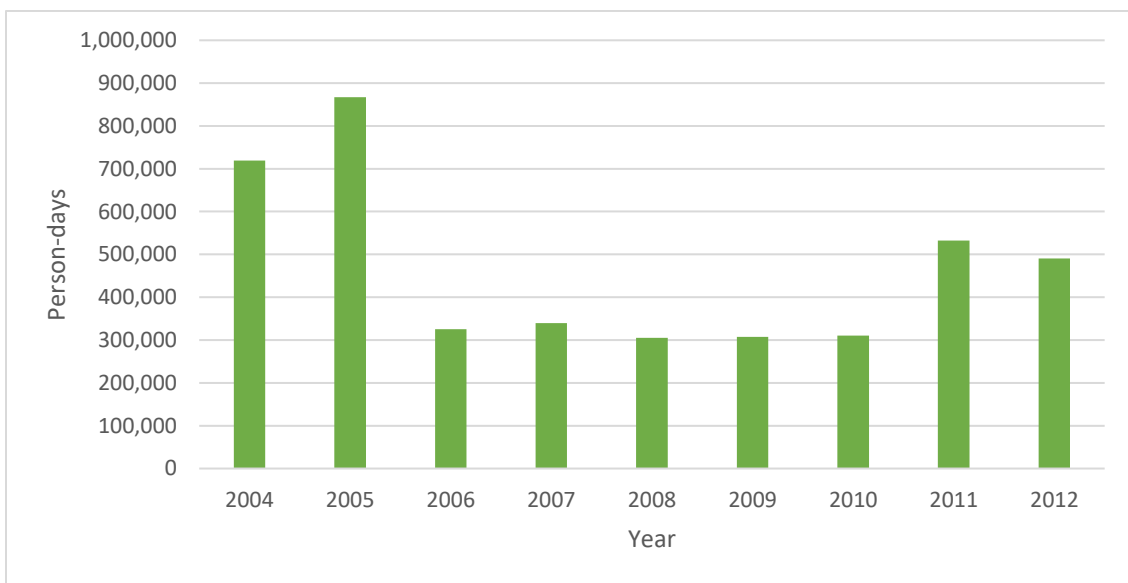


Figure 2 CPFV Person-days for All of California 2004 to 2012

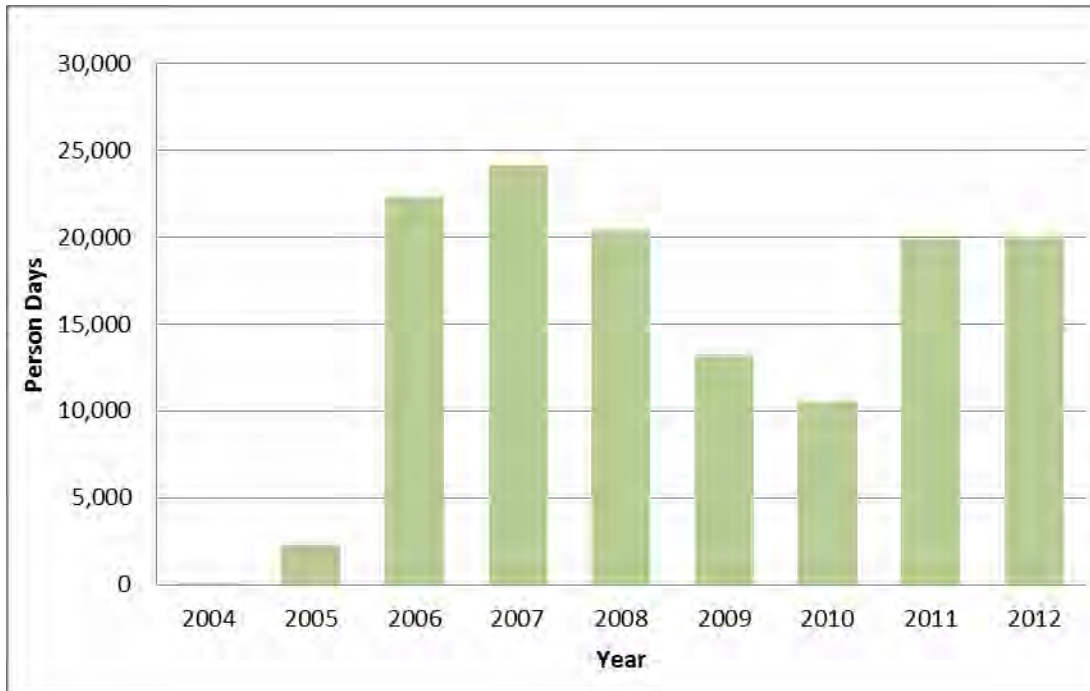


Figure 3 Private/Rental Boat Person-days in the CINMS 2004 – 2012

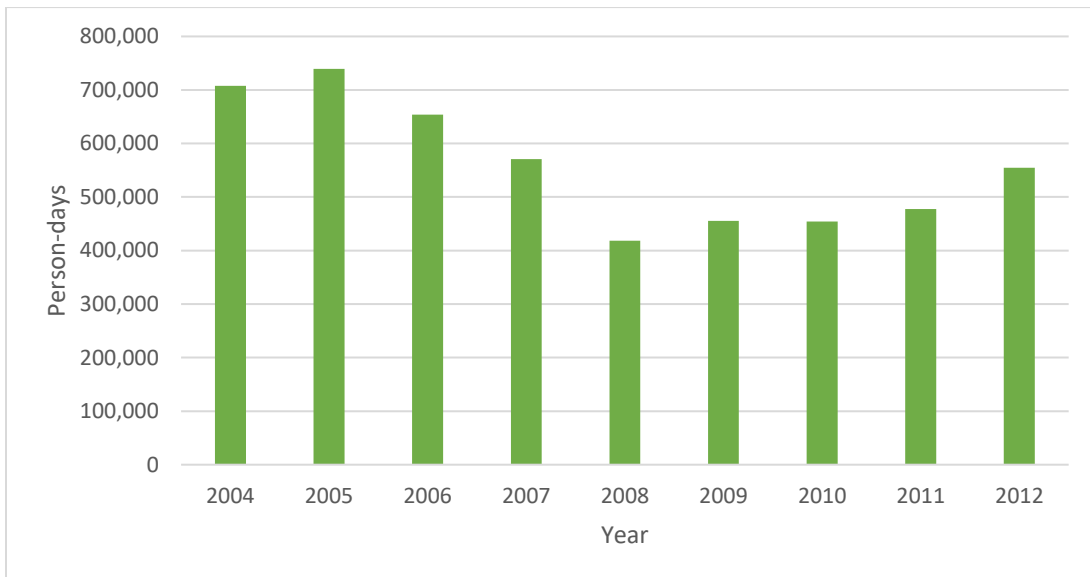


Figure 4 Private/Rental Boat Person-days for All of California 2004 to 2012

Non-consumptive recreation

Non-consumptive recreation was the primary use of CINMS that was expected to benefit from the MPAs. In 1999, as part of the MRWG process, spatial use was estimated, costs-and-earnings data was obtained, and a decision-support tool was developed to analyze spatial alternatives for the MPAs (Leeworthy et al., 2005). Surveys were limited to the for hire operations that take

people out for non-consumptive recreation. In 1999, 26 operations took people out for non-consumptive recreation in CINMS. There were 42,008 person-days in CINMS and these operations received a little over \$611 thousand in profits. Including spending by all passengers in the local three-county economy there was over \$7 million in sales, \$3.7 million in income and 200 jobs supported (Table 4).

Table 4. Baseline 1999 Non-consumptive Recreation from For Hire Operation in the CINMS (2003 \$)

Measurement	Whale Watching	Non-consumptive Diving	Sailing	Kayaking/Sightseeing	Total
Number of Operators ¹	8	7	8	4	26
Person-days	25,984	10,776	4,015	1,233	42,008
Sales	\$4,288,380	\$1,840,581	\$711,267	\$257,487	\$7,097,715
Income	\$2,255,682	\$967,704	\$373,781	\$135,056	\$3,732,223
Employment ²	119.2	52.2	20.4	8.5	200
Profit to Operators	\$275,878	\$195,922	\$137,119	\$2,672	\$611,591

1. Number of operations by activity do not add to the total because some operations do multiple activities.

2. Number of full and part-time jobs.

Source: Leeworthy et al. 2005.

In Leeworthy et al. (2005) projections were made of the benefits to the for-hire operations and the three-area local economy from expected changes in quality of the CINMS environment from the MPAs that would support this industry. It was estimated that there would be an increase of 7,554 person-days of activity per year and an increase in profits to the 26 operations of almost \$107 thousand or \$4,107 per operation per year. Total spending by the passengers would result in an annual increase in direct sales in the local area economy and an increase in income of almost \$679 thousand and 36 additional jobs (Table 5).

Table 5. Projected Increase in Annual Benefits for Non-consumptive Recreation from For Hire Operations in the CINMS due to the MPAs (2003 \$)

Measurement	Whale Watching	Non-consumptive Diving	Sailing	Kayaking/Sightseeing	Total
Number of Operators ¹	8	7	8	4	26
Person-days	4,311	2,398	487	358	7,554
Sales	\$716,841	\$417,278	\$82,310	\$74,859	\$1,291,288
Income	\$377,019	\$219,336	\$43,275	\$39,265	\$678,895
Employment ²	20	12	2	2	36
Profit to Operators	\$45,767	\$43,606	\$16,627	\$777	\$106,777

1. Number of operations by activity do not add to the total because some operations do multiple activities.

2. Number of full and part-time jobs.

Source: Leeworthy et al. 2005.

Conclusion: No studies have been completed post-implementation of CINMS MPAs to test whether these benefits actually occurred. In addition, unlike the commercial and recreational fisheries, there is no institution set up to estimate the uses for non-consumptive recreation. The study conducted by Chen et al. (2014) for the South Coast Region of CA did not have sample sizes large enough to include the CINMS. A study is currently underway for the “for-hire” industry, but is limited to whale watching to address the issue of whale strikes and the commercial ship traffic. The SAMSAP has not continued beyond 2009, so there is no information on access via private/rental boats for non-consumptive recreation. The economic model estimated in Gornik et al. (2013) showed that use and value of CINMS for non-consumptive recreation via access from private/rental boats was positively related to environmental resource attributes measured in the ecological monitoring. In the absence of data that suggest the contrary, it appears most probable that such entities benefited, *ceteris paribus* (all other things being constant), given the high likelihood that natural resource abundance significantly improved, as suggested by ecological monitoring data.

Overall Conclusion

There were no negative impacts on the small entities (primarily small businesses) due to the MPAs in CINMS in either the commercial fisheries or the recreational fisheries, including small businesses impacted indirectly in the local area economy through the multiplier process. Instead, there appears to be small benefits to these businesses. In the absence of data that suggest the contrary, it appears most probable that such entities benefited, *ceteris paribus* (all other things being constant), given the high likelihood that natural resource abundance significantly improved, as suggested by ecological monitoring data.

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