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# **An Economic and Spatial Baseline of Coastal Recreation in the South Coast of California**

## **Report to The California Sea Grant College Program**

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**Authors:**

Cheryl Chen  
Taylor Hesselgrave  
Noah Enelow  
Charles Steinback  
Kristen Sheeran

**Contributing Authors:**

Michael Mertens  
Nick Lyman

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## EXECUTIVE SUMMARY

Coastal recreation provides significant economic and social benefits to coastal communities and to the state of California as a whole. These benefits include, for example, the financial impact of direct expenditures (e.g., hotel stays, dining, shopping) and non-market benefits such as enhanced human well-being. To understand the impact recently established marine protected areas (MPA) might have on future coastal recreation use patterns in the region it is necessary to establish a baseline of how many people use the coast, what they do, and the economic contributions of these different types of uses—especially in a geospatial context.

This study is a part of a larger baseline marine protected areas monitoring effort, entitled the South Coast MPA Baseline Program, tasked with characterizing the ecological and socioeconomic conditions and changes within the South Coast region since MPA implementation. To investigate coastal recreation patterns in the South Coast region, we utilized a standing internet panel hosted by Knowledge Networks (KN) designed to be demographically representative and surveyed 4,492 individuals in select South Coast region counties. The data collected established a baseline characterization of coastal visitation and recreation statistics and a spatial baseline of coastal recreation use patterns in the region.

Coastal trips to Los Angeles were the most popular among respondents, constituting approximately 31.3 percent of total coastal trips respectively. Day trips were most prevalent (no nights spent), constituting 63.9 percent of total trips. The top five most popular coastal recreational activities among survey respondents were beach going (75 percent of the coastal recreators in the study population participated in this activity in the last 12 months), scenic enjoyment (58.2 percent), biking or hiking (29.3 percent), sitting in a car watching the scene (26.1 percent), and swimming or body surfing in the ocean (25.2 percent). Spatial data sets and maps displaying the extent and intensity of use are provided for coastal recreation overall and the top ten most popular coastal recreation activities.

For coastal recreation trips overall, approximately 10.4 percent of trips (or approximately 12.6 million trips) conducted by the study population occur within the South Coast MPA network. Point Dume SMCA was the most popular MPA for overall coastal recreation with 3.2 percent of trips (or approximately 3.9 million trips) occurring there. Point Dume was also the most popular MPA for 7 out of the 10 most popular coastal recreation activities. Crystal Cove SMCA was the most popular MPA for tide pooling with approximate 22.3 percent of tide pooling trips occurring there. Dana Point SMCA was the most popular MPA for biking and hiking with approximately 7.0 percent of trips occurring there and Matlahuayl SMR was the most popular for surfing with an estimated 8.9 percent of surfing trips occurring there.

This study also estimated the total number of coastal visitation trips and direct trip expenditures per year among the study population. Survey respondents took an average of 7.14 coastal trips per year, which results in 120.9 million trips per year among the study population. With respondents spending an average of \$60.21 per trip, we estimated that the study population's total annual coastal visitation trip expenditures were approximately \$7.3 billion. Additionally, we also asked respondents if they were aware of the recently established marine protected area (MPA) networks in the South Coast region. Approximately 18.5% (n=681) of coastal recreation users were aware of the South Coast MPA network.

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## **The South Coast MPA Baseline Program**

This study is a part of a larger baseline marine protected areas (MPAs) monitoring effort, entitled the South Coast MPA Baseline Program, tasked with characterizing the ecological and socioeconomic conditions within the South Coast region. Specifically, this study addresses the Baseline Program objectives by describing human use patterns across the study region and establishing initial data points for long-term tracking of conditions and trends in the South Coast. This study is also a part of a three-part study conducted by Point 97 to provide baseline estimates of the quantity, spatial distribution, and economic value of human uses—specifically human use in three specific sectors: coastal recreation, commercial fishing, and commercial passenger fishing vessels in the South Coast region.

## **Point 97**

Point 97 is a high-tech spin-off of Ecotrust, delivering impact technology solutions and engagement strategies for coastal and marine planning in regions around the world. Working to improve marine and coastal management practices, Point 97 helps partners and clients strengthen coastal communities and ocean ecosystems, bridge different ocean user perspectives and implement management decisions in an inclusive and transparent way. Learn more at [pointnineseven.com](http://pointnineseven.com)

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For questions or comments, please contact Cheryl Chen, Lead Project Manager, at Point 97,  
721 NW 9<sup>th</sup> Avenue, Suite 200  
Portland, OR 97209; 503-467-0812; [cheryl@pointnineseven.com](mailto:cheryl@pointnineseven.com)

## 1. INTRODUCTION

The South Coast region of California, which spans from Point Conception to the north and the California/Mexico border to the south (Figure 1) is well known for its abundant coastal recreation opportunities. These recreation opportunities provide significant economic and social benefits to both visitors and resident coastal communities such as the financial impact of direct expenditures (e.g., hotel stays, dining, shopping) and non-market benefits such as enhanced human well-being. To better understand changes in coastal recreation use patterns and its associated benefits over time, it is necessary to establish a baseline of how many people use the coast, what they do, and the economic contributions of these different types of uses—especially in a geospatial context.

On January 1, 2012, as part of the Marine Life Protection Act (MLPA) Initiative, the California Fish and Wildlife Commission (CFWC) designated 50 marine protected areas (MPAs) within the South Coast state waters of California. This study is a part of the baseline marine protected area monitoring effort to characterize the ecological and socioeconomic conditions and changes within the South Coast Region since MPA implementation. Thus this coastal recreation study is designed to establish a baseline characterization of participation rates and the economic value of coastal recreation and provide a spatial baseline of coastal recreation use patterns in the South Coast region.

Specifically, this report provides four sets of primary findings to establish a baseline characterization of coastal recreation in the region:

1. Estimated proportion of the South Coast resident population that visits the coast overall and both inside and outside MPAs each year and participation rates for specific coastal recreation activities;
2. Spatial patterns of use for overall and specific coastal recreation activities;
3. Direct financial impact of coastal recreation by residents in the region; and
4. Average per person and total number of coastal visitation trips taken each year by South Coast residents.

This project will directly inform the 5-year management review of the South Coast MPAs in which the California Department of Fish and Wildlife (CDFW) will make management and long term monitoring recommendation to the California Fish and Wildlife Commission based on findings from the baseline MPA monitoring projects and other sources of information. This project was developed in close coordination with the MPA Monitoring Enterprise (Monitoring Enterprise), a program of the California Ocean Science Trust, in partnership with the California Department of Fish and Wildlife, and supported by the California Sea Grant College Program and the California Ocean Protection Council (OPC).

It should be emphasized that the trip expenditures estimated in this report are but a portion of the overall economic value of coastal recreation. For instance, in this study we do not account for the secondary economic effects of coastal recreation such as the value (e.g., jobs and wages) of coastal recreation to support industries such as the local tourism economy. Additional valuation methods to investigate the full economic value of coastal recreation, such as hedonic analysis of property prices, input-output analysis of recreation spending, along with identification and explanation of the social and cultural values associated with coastal environments, are important to understand and account for in future monitoring efforts.

## 2. COASTAL RECREATION SURVEY METHODS

A customized, web-based survey instrument, which utilizes Point 97's Viewpoint survey and mapping technology, was used to collect spatially explicit data on coastal recreation. This survey utilized a standing internet panel hosted by Knowledge Networks (KN) designed to be demographically representative based on 2010 U.S. Census statistics. Knowledge Networks is a leader in deploying custom online surveys for various academic, governmental, and commercial applications. Point 97 employed KN's services because the company specializes in probability sampling and providing statistically representative survey data through a peer-reviewed data collection methodology that recruits households by randomly selecting residential addresses using a processes called 'address-based sampling' (ABS). This provides statistically valid representation of the U.S. population as well as reaches many difficult-to-survey populations such as cell phone-only households, non-internet connected

households, African Americans, Latinos, and young adults. It should be emphasized that respondents could not self-select for this survey and all respondents were sampled through Knowledge Network's methods.

An internet panel approach provides several distinct advantages, including: 1) the online panel approach is probability-based, allowing extrapolation to a larger population; 2) we can collect spatial data, which cannot be done with a random digit dial (RDD) phone survey; 3) the cost of a completed online survey is substantially less than a completed in-person survey; and 4) with the lower costs, this approach can be replicated more often and is comparable with existing coastal recreation spatial data sets developed by Point 97 and Ecotrust in other California region. However, it should be noted that potential biases still remain such as recall and non-response biases. In particular a recall bias may be a potential source of error as respondents are asked to recount the activity location and expenditures made on their last coastal recreation trip. This last trip may have occurred as far back as 12 months ago and thus error in a respondent's ability to exactly recall the attributes of their trip may occur. Furthermore, the survey is optional and thus there may potentially be a non-response bias in that the answers of non-responders may have been significantly different than those who responded to the survey.

Utilizing KN's services, Point 97 designed this coastal recreation study to collect spatially explicit data on coastal recreation use patterns, characteristics, and associated trip expenditures. This would have been difficult to achieve using traditional mail or intercept survey methods. The advantage of deploying Point 97's survey tool in combination with KN's services was that all data collected constituted a weighted representative sample (based on U.S. Census data of household characteristics and county of residence) of the larger study population.

The South Coast region coastal recreation survey was launched in May of 2012 after extensive testing to ensure the mapping component of the survey tool would capture quality spatial data at the appropriate scale and in a user-friendly manner. In an effort to capture seasonal variations in coastal use, we collected data on the respondent's most recent coastal trip, and deployed the survey in four survey "waves" over a one-year period.

Data collection was completed in March 2013, and the data were then subsequently analyzed and synthesized. In the survey, respondents were asked to recount details of their coastal visitation trips over the previous 12 months and of their last trip, including information about the number of trips taken, participation in recreational activities, the location of activities, and expenditures made. This section describes the survey and analysis methods, and the results are presented in the following section. The survey questions regarding coastal visitation and recreation use can be found in Appendix A.

Our study population ("sample frame") was defined as the total resident population over the age of 18 years of California counties within our study area. We chose this study population as the primary goal of this study was to investigate coastal recreation, which is commonly defined as day trips to the coast (outside of daily routine) that does not typically involve an overnight stay (although some coastal recreation trip by residents we captured did involve lodging, see trip expenditure section below).

We thus differentiate coastal recreation from coastal tourism, which is often defined as involving overnight stays. However, establishing a clear distinction between the two categories is somewhat difficult as they undoubtedly overlap, making isolation difficult in survey efforts. Furthermore, the value of coastal real estate also may overlap with the value of coastal recreation in the case of a coastal resident who may often recreate on the coast but does not incur any trip expenditures. Indeed, the value of this type of coastal use is captured in coastal real estate values where the individual resides. Thus, we would like to emphasize that the economic data presented in this report reflect coastal recreational day trips only. The value embodied in these trips reflects two factors: direct trip expenditures and indirect travel costs, including the opportunity cost of the recreator's time. To estimate the full value of all coastal recreational activity thus requires further study.

The counties listed below were chosen as our study population as they are counties within the defined South Coast. Figure 1 (below) indicates the scope of the coastal study region on a map that includes the location of major cities within the region.



- San Luis Obispo
- Kern
- San Bernardino
- Santa Barbara
- Ventura
- Los Angeles
- Orange
- Riverside
- San Diego
- Imperial

**Figure 1. South Coast Study Region**

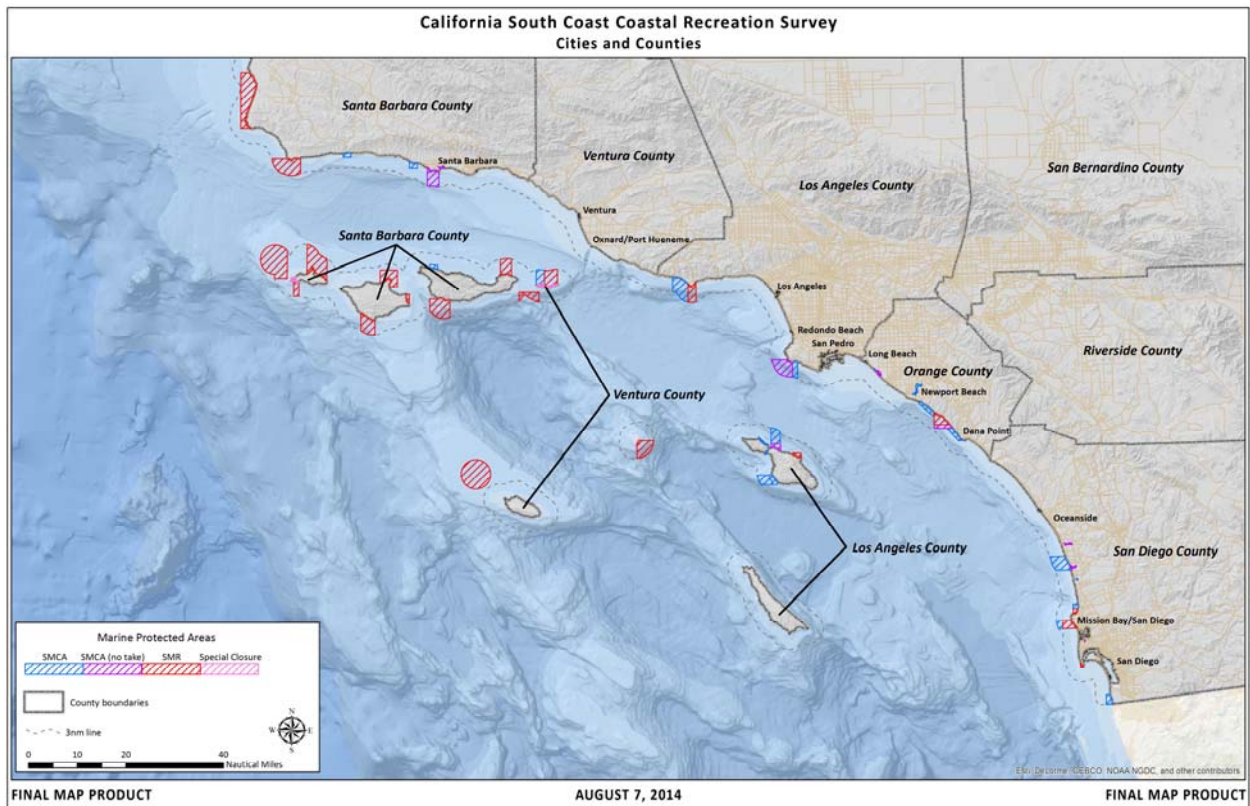


Table 1 (below) displays the study population (16.9 million), the total population of the study area (22.7 million), and the population of the state of California (37.3 million).

**Table 1. 2010 population data**

<b>Area</b>	<b>Population</b>
Study population (>18 yrs)	16,936,297
Study area total population	22,680,010
California state population	37,253,956

*Source: Current study and US Census Bureau*

Survey data focused on a respondent's last trip were collected over four successive waves distributed across a calendar year to capture the seasonal variation in coastal use patterns. Table 2 displays the dates over which each wave was conducted and the respective number of respondents. Overall, the survey was completed by 4,492 respondents. Table 3 displays the median survey length, thirteen minutes, and the total number of respondents that completed the mapping portion of the survey (3,092 which is approximately 69 percent of total respondents)

**Table 2. Survey wave information**

<b>Survey wave</b>	<b>Wave dates</b>	<b>Respondents</b>	<b>%</b>
Wave 1	May 1–Jun. 6, 2012	1,117	25%
Wave 2	Aug. 1–Sep. 5, 2012	1,113	25%
Wave 3	Nov. 14–Nov. 28, 2012	1,126	25%
Wave 4	Feb. 5–Mar. 1, 2013	1,136	25%
<b>TOTAL</b>		<b>4,492</b>	<b>100%</b>

*Source: Current study*

**Table 3. Survey length and completion**

Total number of respondents	4,492
Median survey length (min)	13
# of respondents that completed the mapping portion	3,092

*Source: Current study*

We incorporated verbatim US Census Bureau demographic survey questions into our survey. We then compared our findings to US Census demographic findings as an indication of how representative our survey sample is of the sample frame, see Table 4.

Our survey aimed to be representative of the study area population, and while our data are relatively well matched with 2010 Census findings, there are two exceptions: 1) females are overrepresented; and, 2) Hispanic people are underrepresented.

**Table 4. Demographics of survey and study populations**

<b>Demographics</b>	<b>Survey respondents</b>	<b>Study area population</b>
Male	40.6%	49.7%
Female	59.2%	50.3%
White, Non-Hispanic	66.8%	36.4%
Black, Non-Hispanic	4.2%	6.1%
Other, Non-Hispanic	9.5%	12.1%
Hispanic	17.0%	43.3%
2+ Races, Non-Hispanic	2.6%	2.2%

*Source: Current study and 2010 US Census data*

To analyze the survey data, Knowledge Networks provided a post-stratification survey-weighting methodology to more closely align our survey sample representation with the study population's demographics. Once the survey was complete, Knowledge Networks applied data weights informed by demographic and county of residence data to adjust each respondent's contribution to overall survey results. A data weight is effectively a multiplier that adjusts a given respondent's contribution to compensate for a variety of both planned and unexpected disproportionate effects. The aim of post-stratification survey-weighting is to adjust the weight given to individual sample data based on demographic and zip code residency characteristics so as to better reflect the population they are intended to represent.<sup>1</sup>

Once all respondents completed the survey, Knowledge Networks provided the post-stratification survey weights, and Point 97 used the statistical software R to apply the weights and analyze the data, determining the weighted means as well as confidence intervals<sup>2</sup> as presented in the results below.

To analyze data gathered regarding trip expenditures respondents made on their last trip, we took the following steps to ensure we utilized the best data possible to convey results:

- Respondents who did not indicate they had purchased an item were given a zero value expenditures for that item.
- If respondents indicated that they purchased an item but refused to provide a cost or answer for how many people the expenditure was made for, the entire cost-per-person estimate was assumed to be invalid and was removed from the sample.
- We provide two tables to present analysis results on trip expenditures:
  - The first table (Table 12) displays the average per-person expenditures made by respondents on their last trip. These expenditures are averaged across all respondents who indicated any expenditures, providing an average total trip expenditure estimate which can be scaled up to the larger study population.
  - The second table (Table 13) presents cost-per-person, averaged only across respondents who indicated expenditure for a given item. These values are not weighted and cannot be up scaled but provide information as to how much people on average are spending on expenditure items.

In addition to survey questions, respondents were asked to map the location where they conducted specific coastal recreation activities on their last trip. Details on this component of the survey effort and results are discussed in Section 3.3 of this report below.

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<sup>1</sup> More details about Knowledge Network's post-stratification survey-weighting methods can be found on the KN website: <http://www.knowledgenetworks.com/accuracy/summer2007/disogra.html>

<sup>2</sup> Confidence intervals (CI) are statistical measures of variability which indicate the range of values in which the true value is likely to be given a specified probably, in this report confidence intervals are reported at 95 percent probability.

### 3. COASTAL RECREATION BASELINE RESULTS

This section presents the results of our analyses of the coastal recreational survey data and effectively establishes both an economic and spatial baseline for the South Coast region in terms of:

1. Recreational trips and activities overall and inside and outside MPAs;
2. Recreational trip expenditures; and
3. A spatial baseline of coastal recreational activities.

In addition to these survey questions on recreational trips and expenditures we also asked respondents if they were aware of the recently established marine protected area (MPA) networks in the South Coast region. Approximately 18.5% (n=681) of respondents who indicated they went to the coast at least once in the last 12 months said they were aware of the MPA network. This metric will be important to continue to monitor in order to assess the impact of MPA outreach efforts on the awareness of coastal users.

#### 3.1. Trips and Activities

Table 5 displays the percentage of survey respondents who visited the South Coast in the last twelve months, the average number of trips made annually over all respondents, and the primary reason for respondents' last trip. Overall, 75.7 percent of respondents visited the South Coast over the last twelve months. Across all respondents, that is including those who had not visited the South Coast at all in the last twelve months, the average number of trips per year was 10.25. The primary reason for respondents' most recent trip to the coast was overwhelmingly for recreation (75.9 percent), followed by "other" primary reasons (20.5 percent). The most popular "other" fill-in response was to visit friends and family. Table 6 displays the average number of nights spent per trip for respondents' last trip. Most respondents (63.9 percent) visited the coast for a day trip on their last trip, 15 percent stayed one night, and 9.7 percent stayed two nights.

**Table 5. South Coast coastal visitation summary statistics**

		Average % of total sample	95% Confidence Interval	
			Low	High
<b>Last 12 months</b>	Respondents who visited the South Coast	75.7%	74.5%	77.0%
	Average # of trips over all respondents	10.25	9.17	11.33
	Average # of recreational trips	7.14	6.39	7.89
<b>Last Trip</b>	Primary reason: Recreation	75.9%	74.5%	77.3%
	Primary reason: Work	2.6%	2.1%	3.1%
	Primary reason: School	1.0%	0.7%	1.3%
	Primary reason: Other	20.5%	19.2%	21.8%

Source: Current study

**Table 6. Average length of last trip to the South Coast**

	Average % of total sample	95% Confidence Interval	
		Low	High
Day trip, no nights	63.9%	62.3%	65.4%
One night	15.0%	13.8%	16.2%
Two nights	9.7%	8.7%	10.7%
Three nights	4.4%	3.7%	5.1%
Four nights	1.4%	1.0%	1.7%
Five nights or more	5.7%	4.9%	6.5%

Source: Current study

Table 7 displays the distribution of coastal trips reported by survey respondents over the last 12 months, including confidence intervals. Coastal trips to Los Angeles County were most popular among respondents, constituting approximately 31.3 percent of total coastal trips. The counties of San Diego and Orange followed closely behind at 27.8 percent and 23.7 percent of total reported visits, respectively. Ventura County had the fewest coastal visitors, at approximately 8.4 percent of survey respondents.

**Table 7. Distribution of coastal trips reported in the last 12 months**

<b>County</b>	<b>Average % of total sample</b>	<b>95% Confidence Interval</b>	
		<b>Low</b>	<b>High</b>
Santa Barbara	8.9%	7.1%	10.6%
Ventura	8.4%	5.3%	11.5%
Los Angeles	31.3%	25.4%	37.2%
Orange	23.7%	20.4%	27.0%
San Diego	27.8%	22.5%	33.1%

Table 8 displays the activity participation rates of survey respondents over the last 12 months. The top five most popular activities among survey respondents were beach going (75 percent), scenic enjoyment (58.2 percent), biking or hiking (29.3 percent), sitting in your car watching the scene (26.1 percent), and swimming or body surfing in the ocean (25.2 percent). The confidence intervals for each of these participation rates are also displayed in Table 8. Approximately 12.7 percent of survey respondents indicated that they also participated in “other” activities. The most popular activities people indicated as “other” activities were dining, visiting friends and family, and shopping.

**Table 8. Activity participation in each activity in the last 12 months**

Activity	Average % of total sample	95% Confidence Interval	
		Low	High
Beach going (sitting, walking, running, dog walking, kite flying, etc.)	75.0%	73.6%	76.4%
Scenic enjoyment/sightseeing	58.2%	56.6%	59.8%
Biking or hiking	29.3%	27.9%	30.8%
Sitting in your car watching the scene	26.1%	24.7%	27.5%
Swimming or body surfing in the ocean	25.2%	23.8%	26.6%
Photography	25.1%	23.7%	26.5%
Watching birds and/or other marine life from shore (e.g. whale or seal watching)	22.5%	21.2%	23.9%
Tide pooling	14.5%	13.4%	15.7%
Other, please list	12.7%	11.7%	13.8%
Camping	9.7%	8.7%	10.6%
Collection of non-living resources/beachcombing (agates, fossils, driftwood)	9.1%	8.1%	10.0%
Surfing (board, boogie, stand up paddle, kayak)	8.4%	7.5%	9.3%
Fishing (hook and line) from pier/shore	7.6%	6.7%	8.4%
Kayaking in the ocean or estuary/slough	5.1%	4.4%	5.8%
Fishing (hook and line) from a boat/kayak	4.6%	3.9%	5.3%
Collecting/picking/harvesting sea life from shore (clamming, seaweed, mussels, etc.)	3.8%	3.2%	4.4%
Power boating	3.7%	3.1%	4.3%
Sail boating	3.0%	2.4%	3.5%
Free diving/snorkeling (from shore, from boat)	2.6%	2.1%	3.2%
Using a personal water craft (jet skis)	1.6%	1.2%	2.0%
Skim boarding	1.6%	1.2%	2.0%
SCUBA diving (from shore, from boat)	1.6%	1.2%	2.0%
Diving (picking or spear fishing) from a shore	0.8%	0.5%	1.0%
Windsurfing	0.5%	0.3%	0.7%
Trap/net from pier or shore (lobster/crab)	0.5%	0.3%	0.7%
Surfing (tow-in)	0.5%	0.3%	0.7%
Hang gliding/parasailing	0.4%	0.2%	0.6%
Trap/net from boat/kayak (lobster/crabbing)	0.4%	0.2%	0.6%
Kite boarding	0.4%	0.2%	0.5%
Diving (picking or spear fishing) from a boat/kayak	0.3%	0.2%	0.5%

When asked specifically about coastal activities conducted on their most recent “last” trip, participant activity rates differed slightly, see Table 9. The top five activities respondents participated in on their last trip were beach going (57.7 percent), scenic enjoyment (43.4 percent), photography (18.9 percent), “other” activities (16.8 percent), and watching birds and/or other marine life from shore (14.9 percent). Again, the most popular activities people indicated as “other” activities were dining, visiting friends and family, and shopping. Table 9 also displays the confidence intervals for each activity participation rate.

**Table 9. Participation in each activity for the last trip**

Activity	Average % of total sample	95% Confidence Interval	
		Low	High
Beach going (sitting, walking, running, dog walking, kite flying, etc.)	57.7%	56.1%	59.3%
Scenic enjoyment/sightseeing	43.4%	41.7%	45.0%
Photography	18.9%	17.7%	20.2%
Other, please list	16.8%	15.6%	18.0%
Watching birds and/or other marine life from shore (e.g. whale or seal watching)	14.9%	13.7%	16.0%
Sitting in your car watching the scene	14.0%	12.9%	15.2%
Swimming or body surfing in the ocean	12.1%	11.0%	13.2%
Biking or hiking	11.5%	10.4%	12.5%
Collection of non-living resources/beachcombing (agates, fossils, driftwood)	4.8%	4.1%	5.4%
Tide pooling	4.2%	3.6%	4.9%
Surfing (board, boogie, stand up paddle, kayak)	3.9%	3.3%	4.5%
Camping	3.4%	2.8%	4.0%
Fishing (hook and line) from pier/shore	2.8%	2.3%	3.3%
Collecting/picking/harvesting sea life from shore (clamming, seaweed, mussels, etc.)	2.3%	1.8%	2.8%
Fishing (hook and line) from a boat/kayak	1.8%	1.4%	2.2%
Sail boating	1.2%	0.9%	1.6%
Free diving/snorkeling (from shore, from boat)	0.9%	0.6%	1.2%
Kayaking in the ocean or estuary/slough	0.8%	0.5%	1.1%
Power boating	0.8%	0.5%	1.1%
SCUBA diving (from shore, from boat)	0.5%	0.3%	0.8%
Diving (picking or spear fishing) from a shore	0.5%	0.3%	0.7%
Skim boarding	0.5%	0.3%	0.7%
Using a personal water craft (jet skis)	0.3%	0.1%	0.5%
Windsurfing	0.3%	0.1%	0.4%
Surfing (tow-in)	0.3%	0.1%	0.4%
Trap/net from pier or shore (lobster/crab)	0.1%	0.0%	0.2%
Kite boarding	0.1%	0.0%	0.2%
Diving (picking or spear fishing) from a boat/kayak	0.1%	0.0%	0.2%
Hang gliding/parasailing	0.1%	0.0%	0.2%
Trap/net from boat/kayak (lobster/crabbing)	0.0%	0.0%	0.1%

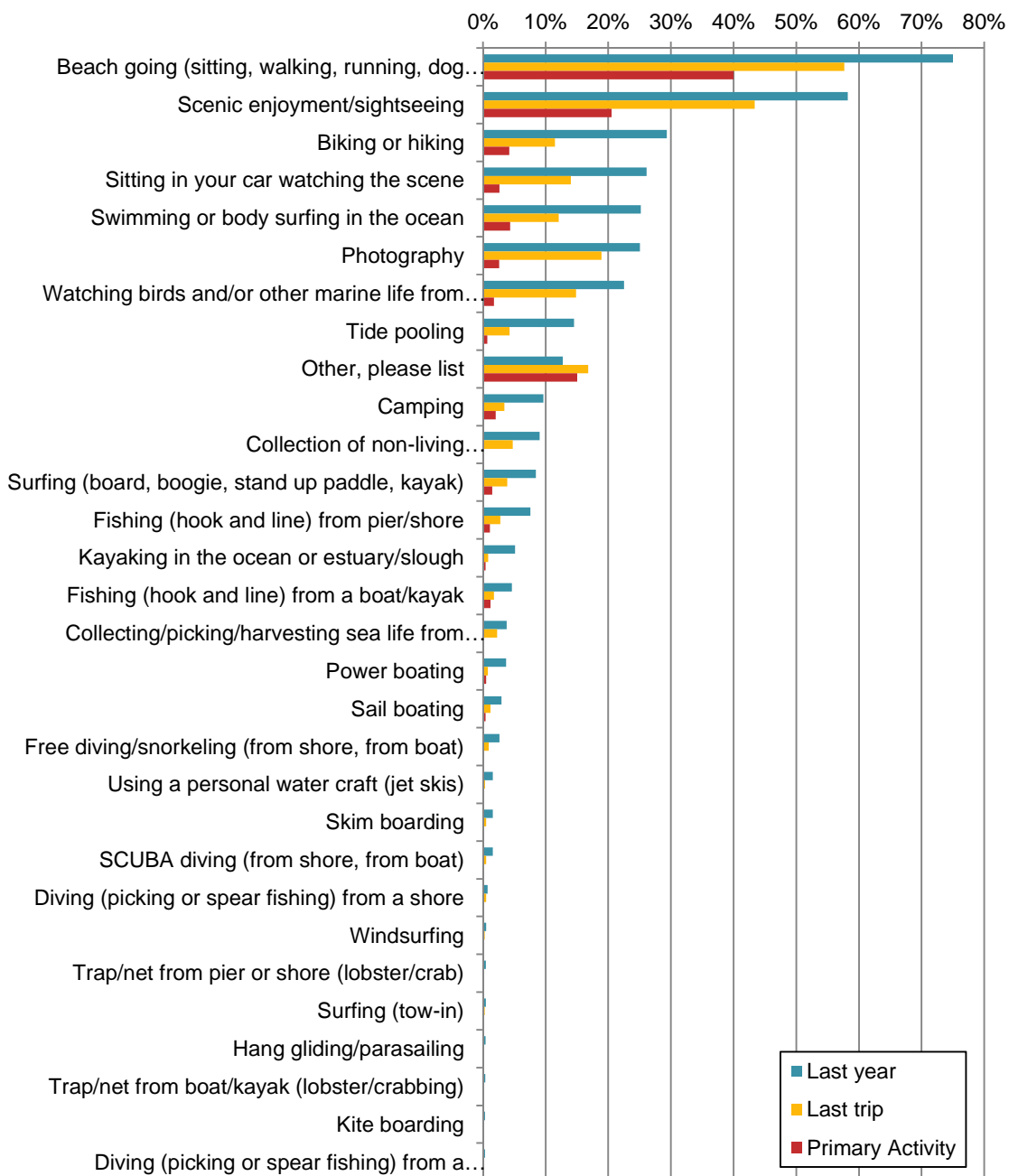
After noting all coastal activities conducted on their most recent “last” trip, participants were asked to choose their primary activity, displayed in Table 10 below. The top five activities respondents participated in on their last trip were beach going (40 percent), scenic enjoyment (20.6 percent), “other” activities (15 percent), swimming or body surfing (4.3 percent), and biking or hiking (4.2 percent). Again, the most popular activities people indicated as “other” activities were dining, visiting friends and family, and shopping. Table 10 also displays the confidence intervals for each activity participation rate.

**Table 10. Primary recreational activity for the last trip**

Activity	Average % of total sample	95% Confidence Interval	
		Low	High
Beach going (sitting, walking, running, dog walking, kite flying, etc.)	40.0%	38.4%	41.6%
Scenic enjoyment/sightseeing	20.6%	19.2%	21.9%
Other, please list	15.0%	13.9%	16.2%
Swimming or body surfing in the ocean	4.3%	3.7%	5.0%
Biking or hiking	4.2%	3.6%	4.9%
Sitting in your car watching the scene	2.6%	2.1%	3.1%
Photography	2.6%	2.1%	3.1%
Camping	2.0%	1.6%	2.5%
Watching birds and/or other marine life from shore (e.g. whale or seal watching)	1.7%	1.3%	2.2%
Surfing (board, boogie, stand up paddle, kayak)	1.5%	1.1%	1.9%
Fishing (hook and line) from a boat/kayak	1.2%	0.9%	1.6%
Fishing (hook and line) from pier/shore	1.1%	0.8%	1.4%
Tide pooling	0.7%	0.4%	1.0%
Power boating	0.5%	0.3%	0.7%
Kayaking in the ocean or estuary/slough	0.4%	0.2%	0.7%
Sail boating	0.4%	0.2%	0.6%
Collecting/picking/harvesting sea life from shore (clamming, seaweed, mussels, etc.)	0.2%	0.1%	0.4%
SCUBA diving (from shore, from boat)	0.2%	0.0%	0.3%
Collection of non-living resources/beachcombing (agates, fossils, driftwood)	0.2%	0.0%	0.3%
Surfing (tow-in)	0.1%	0.0%	0.3%
Using a personal water craft (jet skis)	0.1%	0.0%	0.2%
Free diving/snorkeling (from shore, from boat)	0.1%	0.0%	0.2%
Skim boarding	0.0%	0.0%	0.1%
Kite boarding	0.0%	0.0%	0.1%
Diving (picking or spear fishing) from a boat/kayak	0.0%	0.0%	0.1%
Trap/net from boat/kayak (lobster/crabbing)	0.0%	0.0%	0.0%
Diving (picking or spear fishing) from a shore	0.0%	0.0%	0.0%
Trap/net from pier or shore (lobster/crab)	0.0%	0.0%	0.0%
Hang gliding/parasailing	0.0%	0.0%	0.0%
Windsurfing	0.0%	0.0%	0.0%



**Figure 2. Activity participation rates, last year and last trip**



**Table 11. Percent of activity trips inside and outside MPAs and most popular MPA for specific activities**

<b>Activity</b>	<b>Average % of trips</b>	<b>Total estimated number of trips</b>	<b>Estimated % of trips inside MPAs</b>	<b>Estimated % of trips outside MPAs</b>	<b>Most popular MPA for this activity</b>	<b>Estimated % of trips inside most popular MPA</b>
All coastal recreation activities combined	100.0%	120,886,982	10.4%	89.6%	Point Dume SMCA	3.2%
Beach going (sitting, walking, running, dog walking, kite flying, etc.)	57.7%	69,751,789	8.4%	91.6%	Point Dume SMCA	2.4%
Scenic enjoyment/sightseeing	43.4%	52,464,950	10.0%	90.0%	Point Dume SMCA	1.9%
Photography	18.9%	22,847,640	10.8%	89.2%	Point Dume SMCA	4.0%
Watching birds and/or other marine life from shore (e.g. whale or seal watching)	14.9%	18,012,160	18.5%	81.5%	Point Dume SMCA	12.6%
Sitting in your car watching the scene	14.0%	16,924,177	16.3%	83.7%	Point Dume SMCA	5.9%
Swimming or body surfing in the ocean	12.1%	14,627,325	12.2%	87.8%	Point Dume SMCA	5.4%
Biking or hiking	11.5%	13,902,003	7.0%	93.0%	Dana Point SMCA	1.9%
Collection of non-living resources/beachcombing (agates, fossils, driftwood)	4.8%	5,802,575	27.1%	72.9%	Point Dume SMCA	17.9%
Tide pooling	4.2%	5,077,253	22.3%	77.7%	Crystal Cove SMCA	8.6%
Surfing (board, boogie, stand up paddle, kayak)	3.9%	4,714,592	8.9%	91.1%	Matlahuayl SMR	2.6%

Table 11 above details estimates on the number of trips that were conducted for the ten most popular coastal recreation activities and for all coastal recreation activities combined. Furthermore, using the spatial data collected we estimated the percent of trips that occurred inside and outside the South Coast MPA network for each activity and coastal recreation overall. We also assessed the most popular MPA for each activity and the percentage of trips that occurred in the most popular MPA.

For coastal recreation trips overall, approximately 10.4 percent of trips (or approximately 12.6 million trips) conducted by the study population occur within the South Coast MPA network. Point Dume SMCA was the most popular MPA for overall coastal recreation with 3.2 percent of trips (or approximately 3.9 million trips) occurring there. Point Dume was also the most popular MPA for 7 out of the 10 most popular coastal recreation activities. Crystal Cove SMCA was the most popular MPA for tide pooling with approximate 8.6 percent of tide pooling trips occurring there. Dana Point SMCA was the most popular MPA for biking and hiking with approximately 1.9 percent of trips occurring there and Matlahuayl SMR was the most popular for surfing with an estimated 2.6 percent of surfing trips occurring there.

### 3.2. Trip Expenditures

Table 12 displays the average expenditures made for each item across all respondents on their last trip. Averaged across all respondents (including those without dining expenses), the highest expense was food and beverage purchases at a restaurant or bar at approximately \$18.48. These were also the most prevalent type of expenditures made, with 56.3 percent of respondents reporting such expenditures. The next largest average expenditure per respondent was lodging, at approximately \$16.38 per trip, though only 13.1 percent of respondents reported these. Adding together the average expenditures per item across all items, we estimate a total trip expenditures figure at approximately \$60.21 per person, per trip.

**Table 12. Average trip expenditures per person by item across all respondents, last trip**

Item	Across all respondents			
	Average expenditures (\$)	95% Confidence Interval		% of observations
		Low	High	
Food and beverages at a restaurant or bar	\$18.48	\$17.13	\$19.82	56.3%
Lodging (if you stayed overnight)	\$16.38	\$13.76	\$19.00	13.1%
Other	\$6.97	\$3.97	\$9.97	6.6%
Food and beverages from a store	\$6.13	\$5.49	\$6.77	41.0%
Souvenirs (t-shirts, posters, gifts, etc.)	\$3.74	\$3.25	\$4.22	13.4%
Parking	\$2.56	\$2.26	\$2.87	45.3%
Museum, aquarium, or other entrance fee	\$1.59	\$1.33	\$1.85	7.3%
Car rental	\$1.03	\$0.51	\$1.56	1.3%
Sundries (sunscreen, surf wax, motion sickness pills, batteries, film and processing etc.)	\$0.66	\$0.52	\$0.79	7.4%
Charter fee (whale watching, fishing, etc.)	\$0.47	\$0.25	\$0.69	1.4%
Boat rental	\$0.42	\$0.25	\$0.58	1.1%
Bike rental	\$0.35	\$0.25	\$0.45	2.2%
Boat fuel	\$0.33	\$0.11	\$0.55	0.8%
Lessons, clinics, camps	\$0.25	\$0.00	\$0.55	0.4%
Bait and tackle	\$0.22	\$0.15	\$0.29	2.2%
Kayak rental	\$0.19	\$0.10	\$0.28	0.9%
One-day fishing license fee	\$0.19	\$0.10	\$0.28	0.9%
Surfboard or bodyboard rental	\$0.13	\$0.04	\$0.22	0.4%
Hang glide rental	\$0.07	\$0.00	\$0.15	0.4%
Dive equipment rental and airfills	\$0.03	\$0.01	\$0.05	0.3%
Ramp fees	\$0.03	\$0.01	\$0.04	0.4%
	<b>\$60.21</b>	<b>\$49.43</b>	<b>\$70.99</b>	

Source: Current study

Table 13 displays the average expenditure for each item across only respondents who indicated expenses for that item. In other words, among all respondents who spent money on lodging expenses, the average expenditure amount was approximately \$130.45 per person per last trip. For those that listed “other” expenses, they were the highest per person per trip average expenditure out of all items. While the majority of “other” expenditures included nominal expenses on shopping or event participation expenses, the high average is due to a handful of respondents reporting very large expenses for cruises or weddings. This was followed by expenditures on lodging (\$130.45) and on car rentals (\$80.44).

It is important to explicitly note that the average expenditures per item presented in Table 13 should not be added together. For example, only 0.3 percent of total respondents indicated expenses on dive equipment rentals. Because some of the sample sizes used to estimate the average expenditures presented in Table 13 were small, these amounts have not been weighted and are therefore not upscale-able to the population of the entire study area.

**Table 13. Average expenditures per item per person across respondents reporting expenditures for a certain item, last trip**

Item	Average expenditures (\$)	95% Confidence Interval		% of observations
		Low	High	
Other	\$155.52	\$97.59	\$213.45	6.6%
Lodging (if you stayed overnight)	\$130.45	\$114.09	\$146.80	13.1%
Car rental	\$80.44	\$44.76	\$116.11	1.3%
Lessons, clinics, camps	\$59.38	\$0.00	\$136.72	0.4%
Boat fuel	\$46.78	\$18.07	\$75.48	0.8%
Boat rental	\$40.56	\$31.58	\$49.54	1.1%
Charter fee (whale watching, fishing, etc.)	\$35.03	\$22.40	\$47.66	1.4%
Food and beverages at a restaurant or bar	\$33.25	\$31.12	\$35.39	56.3%
Surfboard or bodyboard rental	\$31.58	\$19.06	\$44.10	0.4%
Souvenirs (t-shirts, posters, gifts, etc.)	\$28.76	\$25.86	\$31.66	13.4%
Museum, aquarium, or other entrance fee	\$24.08	\$21.55	\$26.60	7.3%
Kayak rental	\$22.47	\$15.52	\$29.43	0.9%
One-day fishing license fee	\$22.00	\$14.33	\$29.66	0.9%
Hang glide rental	\$19.31	\$0.00	\$76.16	0.4%
Bike rental	\$16.43	\$13.47	\$19.40	2.2%
Food and beverages from a store	\$15.27	\$13.76	\$16.78	41.0%
Dive equipment rental and airfills	\$10.88	\$7.36	\$14.40	0.3%
Bait and tackle	\$10.81	\$7.95	\$13.68	2.2%
Sundries (sunscreen, surf wax, motion sickness pills, batteries, film and processing etc.)	\$9.16	\$7.53	\$10.79	7.4%
Ramp fees	\$7.71	\$4.56	\$10.85	0.4%
Parking	\$5.72	\$5.04	\$6.41	45.3%

Source: Current study

Figure 3 displays the relative average expenditures made per person per trip for all items as displayed in Table 12. Expenditures on food and beverages and lodging combined make up 78.4 percent of the total average trip expenditure per person.

**Figure 3. Average expenditure per trip for coastal visitation**

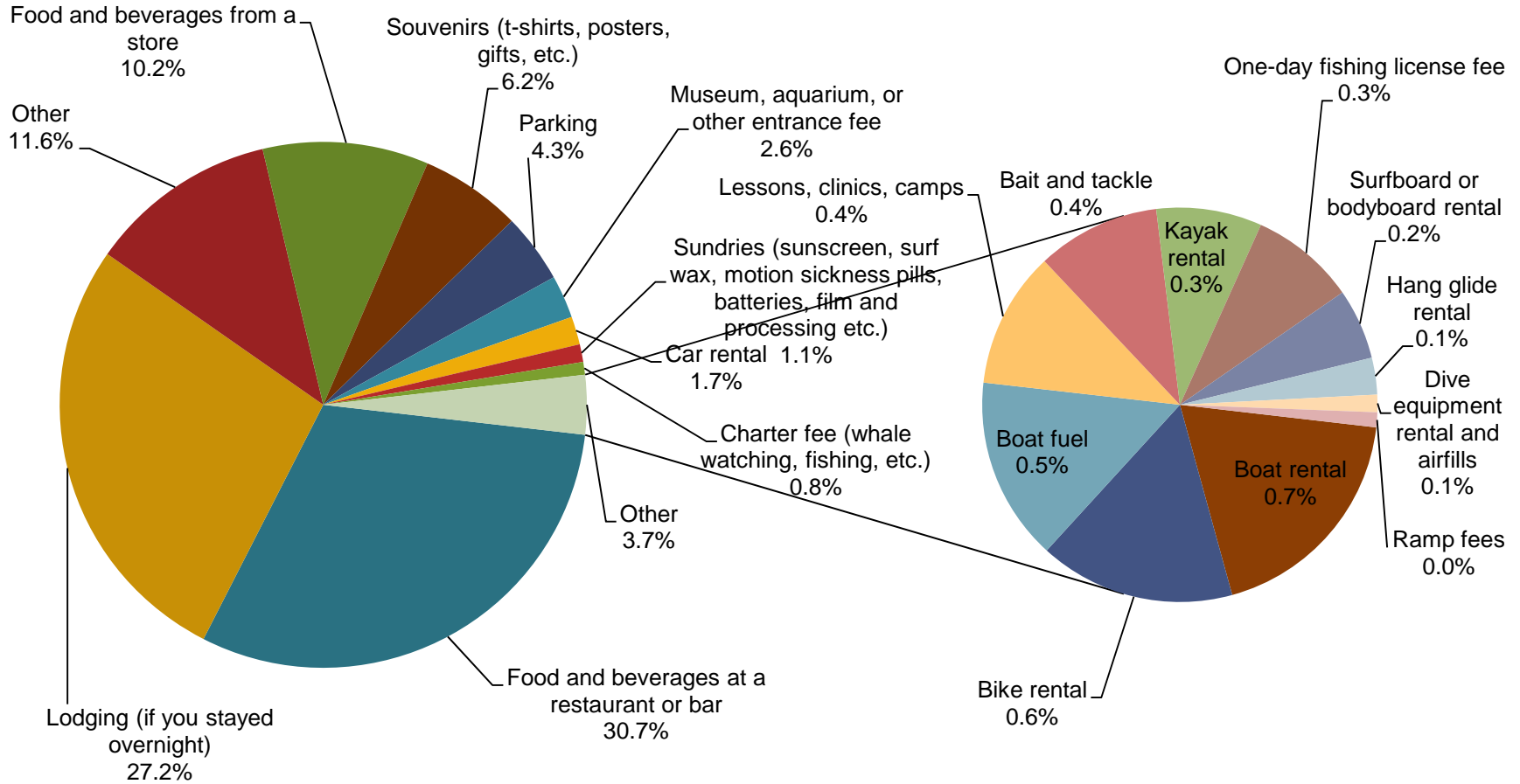


Table 14 displays the estimated total number of trips and direct expenditures per year among the study population. Given that survey respondents took an average of 7.14 coastal trips per year (average across all survey respondents), we estimated a total of 120.9 million trips per year among the study population. With respondents spending an average of \$60.21 per trip, we estimated that the study population's total annual coastal visitation trip expenditures were approximately \$7.28 billion (117 million trips x \$60.21 per trip = \$7.04 billion).

**Table 14. Estimated number of trips and direct expenditures**

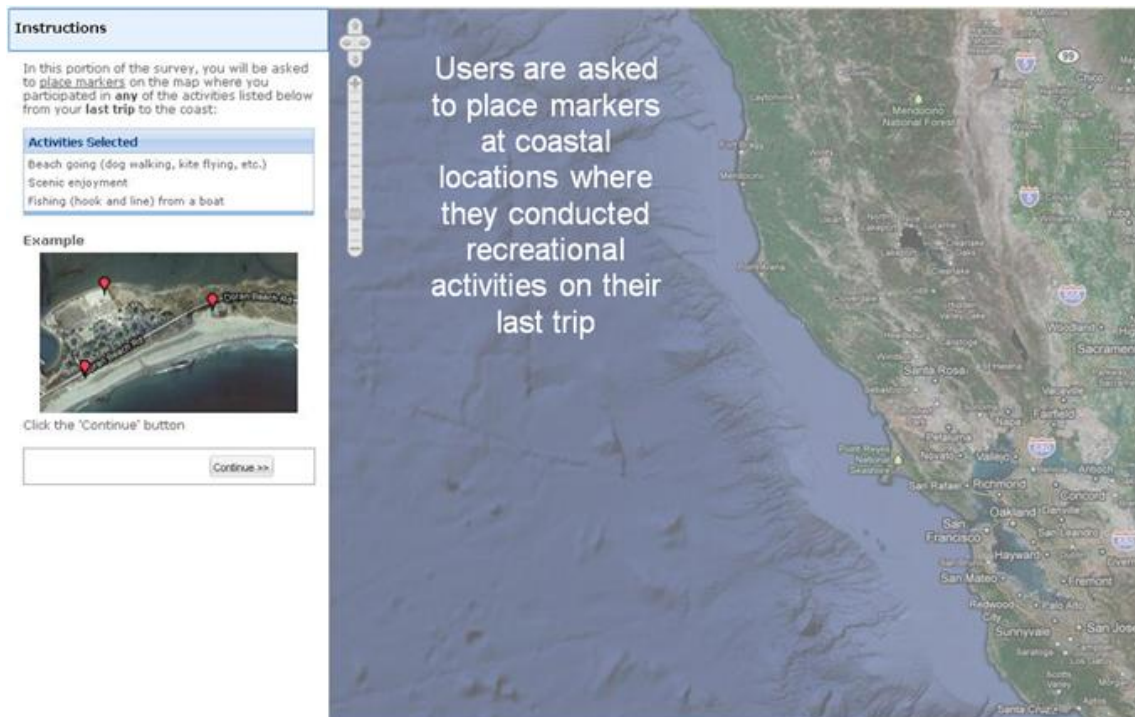
		95% Confidence Interval	
		Low	High
Study population (>18 years)	16,936,297	16,936,297	16,936,297
Average # of recreational trips/year	7.14	6.39	7.89
Estimated number of trips for total study population	120,886,982	108,150,314	133,623,650
Average expenditure/trip	\$60.21	\$49.43	\$70.99
<b>Total estimated average annual recreational expenditures (billions \$)</b>	<b>\$7.3</b>	<b>\$5.3</b>	<b>\$9.5</b>

Source: Current study

### 3.3. A Spatial Baseline of Coastal Recreation

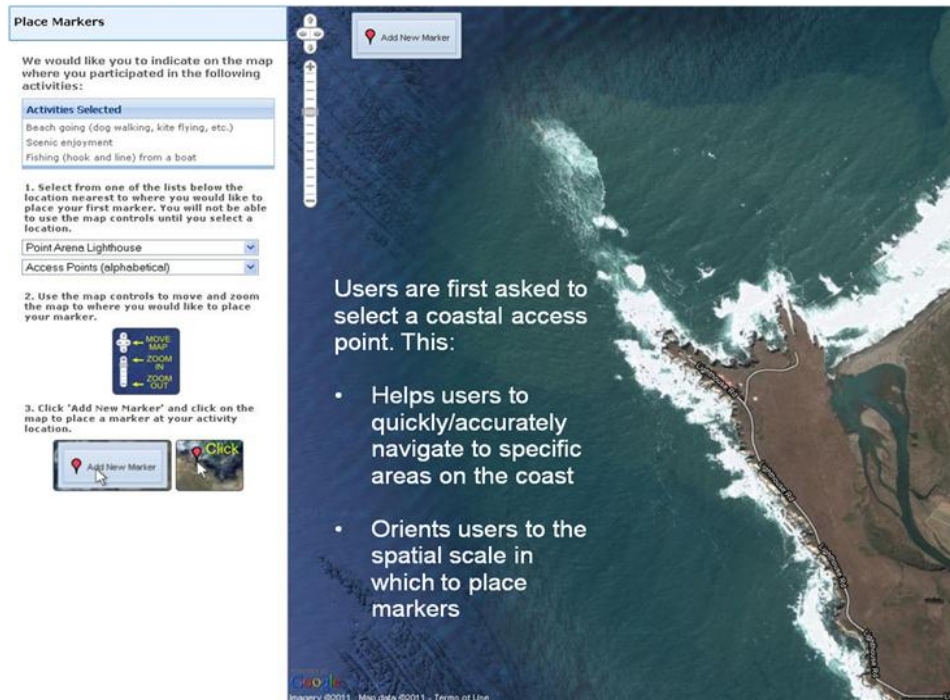
In addition to survey questions, respondents were asked to map the location of where they conducted specific coastal recreation activities on their last trip. To map locations, Point 97 developed a sophisticated mapping tool utilizing its Viewpoint survey technology together with Google Maps (displayed in the screenshots below). The mapping tool was designed to be user-friendly and easily navigable. It required each respondent to zoom to a particular spatial scale in order to ensure that accurate and quality data were collected.

**Figure 4. Screenshot of coastal recreation survey: Map interface**



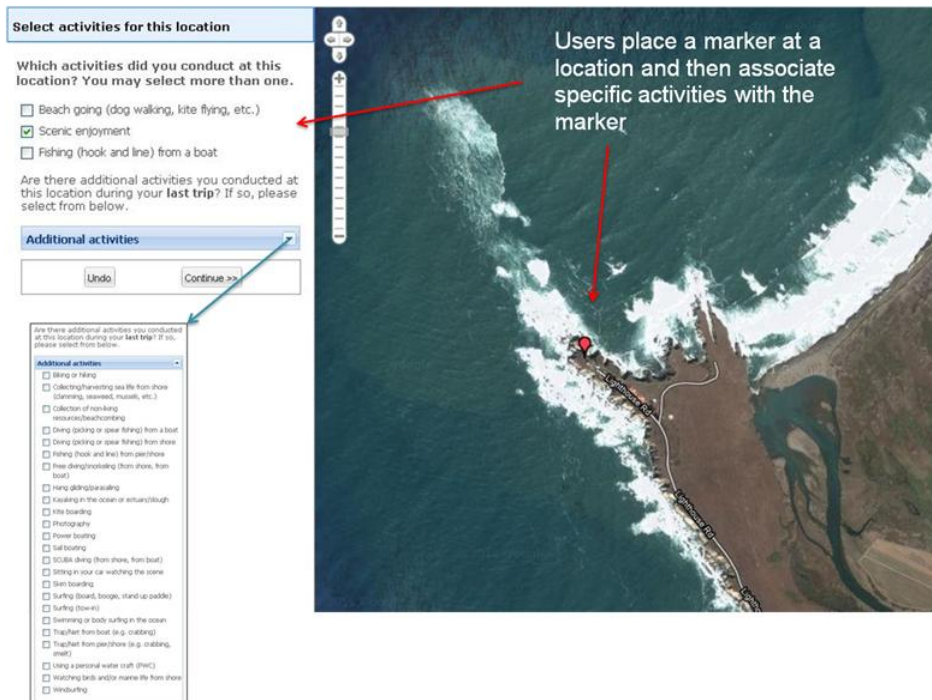
Source: Point 97

**Figure 5. Screenshot of coastal recreation survey: Map navigation**



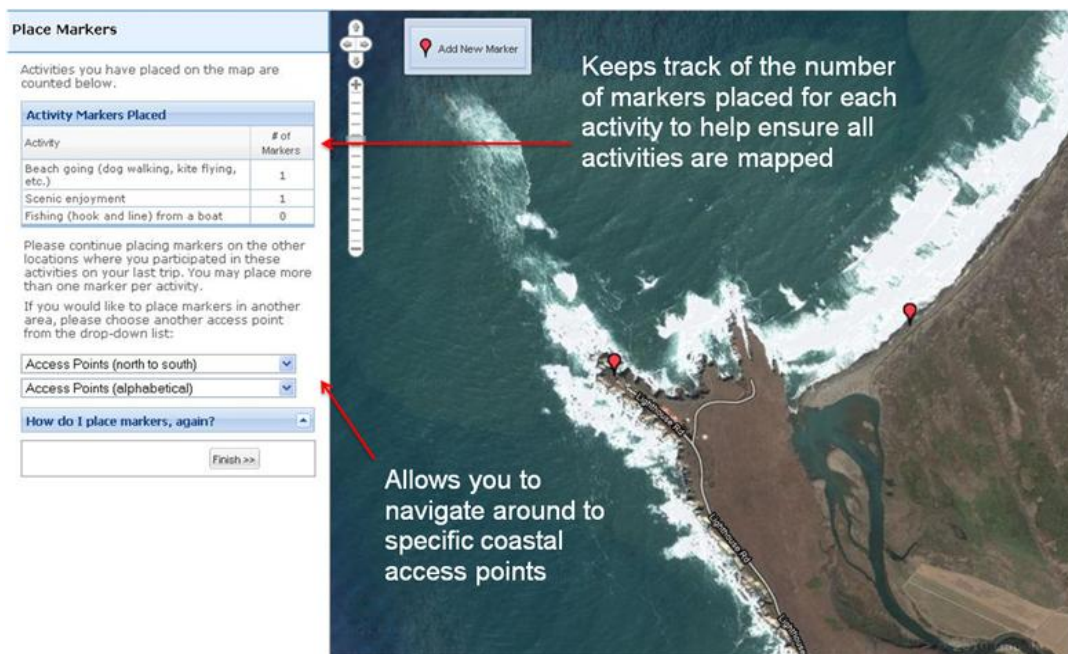
Source: Point 97

**Figure 6. Screenshot of coastal recreation survey: Placing activity markers**



Source: Point 97

**Figure 7. Screenshot of coastal recreation survey: Tracking activity markers**



Source: Point 97

As noted above the data were collected in four waves to capture seasonal variations in coastal recreation use patterns. The spatial data are a combined set across all four survey waves. The survey respondents provided information by placing a point or marker on a map and then indicated which activity or activities they conducted at each specific location on their last trip (Figure 6). There were a total of twenty-eight activities mapped. Appendix B of this report contains maps depicting the spatial patterns of use (distribution and intensity of use) across the region for coastal recreation overall and for the top ten select coastal recreation activities. Table 15 (below) indicates the number of markers placed per activity per survey wave for all activities.

To create the spatial data, Point 97 utilized a kernel density analysis in ArcGIS. The kernel analysis is a nonparametric statistical method for estimating probability densities from a set of point data. Conceptually, a smooth raster surface is fitted over each point. The surface value is highest at the location of the point and diminishes with increasing distance (i.e., search radius), eventually reaching zero. The kernel density analysis on all activities was given a search radius of one mile, which were based on our assumption that an average coastal recreation user may typically recreate within a one mile area for each recreation activity location mapped.

Weights given to the markers placed by individual respondents were also used and incorporated into the kernel density analysis. As discussed above, these weights were created by Knowledge Networks to align respondent demographics with study population demographics. The resulting data set is a smooth raster surface depicting the intensity use or density of an activity. Table 15 displays the total number of activity markers that respondents placed for each activity in the mapping survey and Appendix B presents select coastal recreation map products from these efforts.



**Table 15. Number of markers placed for each activity in mapping survey**

Activity name	Number of activity markers placed				TOTAL
	Wave 1	Wave 2	Wave 3	Wave 4	
Beach going (sitting, walking, running, dog walking, kite flying, etc.)	801	736	751	750	<b>3,038</b>
Scenic enjoyment/sightseeing	617	671	600	674	<b>2,562</b>
Photography	242	247	242	261	<b>992</b>
Watching birds and/or marine life from shore	216	216	177	187	<b>796</b>
Biking or hiking	150	166	146	180	<b>642</b>
Sitting in your car watching the scene	135	125	131	130	<b>521</b>
Swimming or body surfing in the ocean	83	156	131	77	<b>447</b>
Collection of non-living resources/beachcombing	44	65	48	39	<b>196</b>
Surfing (board, boogie, stand up paddle, kayak)	16	69	66	33	<b>184</b>
Tide pooling	37	55	27	40	<b>159</b>
Camping	33	29	18	35	<b>115</b>
Fishing (hook and line) from pier/shore	16	16	16	22	<b>70</b>
Sail boating	10	6	30	15	<b>61</b>
Fishing (hook and line) from a boat/kayak	10	17	21	8	<b>56</b>
Kayaking in the ocean or estuary/slough	18	14	9	2	<b>43</b>
Collecting/picking/harvesting sea life from shore (clamming, seaweed, mussels, etc.)	10	9	13	10	<b>42</b>
Power boating	6	12	10	7	<b>35</b>
Free diving/snorkeling (from shore, from boat)	2	10	2	3	<b>17</b>
SCUBA diving (from shore, from boat)	1	8	5	3	<b>17</b>
Skim boarding	0	5	6	4	<b>15</b>
Trap/Net from pier or shore (lobster/crab)	3	0	2	6	<b>11</b>
Using a personal water craft (jet skis)	0	4	3	1	<b>8</b>
Surfing (tow-in)	0	3	1	2	<b>6</b>
Diving (picking or spear fishing) from a shore	1	1	1	0	<b>3</b>
Diving (picking or spear fishing) from a boat/kayak	0	1	2	0	<b>3</b>
Trap/Net from boat/kayak (lobster/crabbing)	1	0	0	0	<b>1</b>
Windsurfing	0	0	1	0	<b>1</b>
<b>Total</b>	<b>2,452</b>	<b>2,641</b>	<b>2,459</b>	<b>2,489</b>	<b>10,041</b>

## Appendix A. Coastal Recreation Survey Questions

*The following is an exact copy of the survey text regarding coastal recreation questions.*

SCREENER1. Do you currently live in California?

SCREENER2. Do you live in one of the following counties?

Imperial  
Kern  
Los Angeles  
Orange  
Riverside  
San Bernardino  
San Diego  
San Luis Obispo  
Santa Barbara  
Ventura

Q1. We are interested in knowing about your coastal activity in Southern California. Have you been to the South Coast of California (dark blue area) at least once in the last 12 months? [Figure: Map of region, with shaded area distinguishing study region.]

Yes  
No

The following questions are about your visits to the South Coast of California during the last 12 months. A visit is defined as an intentional trip to the South Coast of California separate from your daily routine.

Q2a. Please estimate how many visits you have made to the South Coast of California in the last 12 months.

Q2b. How many of your visits to the South Coast of California in the last 12 months were primarily for recreation? (e.g., beach going, bird watching, fishing, surfing, boating, etc.)

Q3. We are interested in knowing what types of recreational activities you do when you go to the South Coast of California. Which of the following activities have you participated in during the last 12 months in the South Coast of California?

- a) Beach going (sitting, walking, running, dog walking, kite flying, etc.)
- b) Biking or hiking
- c) Collection of non-living resources/beachcombing (agates, fossils, driftwood)
- d) Camping
- e) Photography
- f) Scenic enjoyment/sightseeing
- g) Sitting in your car watching the scene
- h) Watching birds and/or other marine life from shore (e.g. whale or seal watching)
- i) Tide pooling
- j) Fishing (hook and line) from pier/shore
- k) Fishing (hook and line) from a boat/kayak
- l) Diving (picking or spear fishing) from a boat/kayak
- m) Diving (picking or spear fishing) from a shore
- n) Trap/net from pier or shore (lobster/crab)
- o) Trap/net from boat/kayak (lobster/crabbing)
- p) Collecting/picking/harvesting sea life from shore (clamming, seaweed, mussels, etc.)
- q) Hang gliding/parasailing
- r) Kite boarding
- s) Skim boarding
- t) Surfing (board, boogie, stand up paddle, kayak)
- u) Surfing (tow-in)
- v) Swimming or body surfing in the ocean
- w) Windsurfing
- x) Free diving/snorkeling (from shore, from boat)
- y) Kayaking in the ocean or estuary/slough
- z) Power boating
- aa) Sail boating
- bb) SCUBA diving (from shore, from boat)
- cc) Using a personal water craft (jet skis)
- dd) Other, please list:

Q4. Below is a map of the coastal counties within the South Coast of California. You previously responded that you visited the South Coast of California [INSERT RESPONSE FROM Q2b] time(s) to recreate in the last 12 months. Please indicate how many times you visited each of these coastal counties to recreate in the last 12 months on the map below. If you did not visit a particular coastal county, please choose 'zero'. Your best estimate of the county is fine.

Q4a. For how long have you been visiting the South Coast of California and enjoying one or more of the activities you identified?

- Just the last year
- One to three years
- About four to ten years
- More than ten years
- All my life

Q5. When did you last visit one of the South Coast of California areas shown on the previous map? Your best estimate is fine.

Q6. Was recreation (e.g., beach going, bird watching, fishing, surfing, boating, etc) the primary reason for this last visit?

- Yes
- No

Q6a. What was the primary reason for your last visit to the South Coast of California?

- Work
- School
- Other, please specify:

Q7. On your last visit, did you start your trip from your home?

- Yes
- No

Q8. What mode(s) of transportation did you use to get to the South Coast of Californian on your last visit?

- Bus
- Bike
- Walking
- Drove personal car
- Drove a rented car
- Rode with someone else – carpoled
- Other, please specify:

Q9. How would you describe the car that you used to get to the South Coast of California on your last visit?

- Compact car, small sedan or light pick-up truck
- Large sedan
- Wagon
- Mini-van
- Cross-over
- Sport utility vehicle
- Standard pickup truck
- Hybrid sedan
- Other, please specify:

Q10. Please estimate the number of miles traveled during your last visit to the South Coast of California.

Q11. Approximately how many people (including yourself) went on that trip?

Q12. Please estimate how many of these people (including yourself) permanently reside in California.

Q13. Did you participate in any of the following coastal recreation activities during your last visit to the South Coast of California?

- a) Beach going (sitting, walking, running, dog walking, kite flying, etc.)
- b) Biking or hiking
- c) Collection of non-living resources/beachcombing (agates, fossils, driftwood)
- d) Camping
- e) Photography
- f) Scenic enjoyment/sightseeing
- g) Sitting in your car watching the scene
- h) Watching birds and/or other marine life from shore (e.g. whale or seal watching)
- i) Tide pooling
- j) Fishing (hook and line) from pier/shore
- k) Fishing (hook and line) from a boat/kayak
- l) Diving (picking or spear fishing) from a boat/kayak
- m) Diving (picking or spear fishing) from a shore
- n) Trap/net from pier or shore (lobster/crab)
- o) Trap/net from boat/kayak (lobster/crabbing)
- p) Collecting/picking/harvesting sea life from shore (clamming, seaweed, mussels, etc.)
- q) Hang gliding/parasailing
- r) Kite boarding
- s) Skim boarding
- t) Surfing (board, boogie, stand up paddle, kayak)
- u) Surfing (tow-in)
- v) Swimming or body surfing in the ocean

- w) Windsurfing
- x) Free diving/snorkeling (from shore, from boat)
- y) Kayaking in the ocean or estuary/slough
- z) Power boating
- aa) Sail boating
- bb) SCUBA diving (from shore, from boat)
- cc) Using a personal water craft (jet skis)
- dd) Other, please list:

Q14. Of the following activities you selected what was your primary activity during your last visit to the South Coast of California? (please select only one)

Q15. To help us improve future surveys, was the mapping portion of this survey easy to understand and use?

- Strongly Agree
- Somewhat Agree
- Neither Agree nor Disagree
- Somewhat Disagree
- Strongly Disagree

Q16 How many nights did you spend at the coast during your last visit to South Coast of California?

Q17a. During your last visit to the South Coast of California, please indicate if your party spent money on the following items.

- a) Parking
- b) Food and beverages from a store
- c) Food and beverages at a restaurant or bar
- d) Souvenirs (t-shirts, posters, gifts, etc.)
- e) Sundries (sunscreen, surf wax, motion sickness pills, batteries, film and processing etc.)
- f) Boat rental
- g) Car rental
- h) Dive equipment rental and airfills
- i) Kayak rental
- j) Surfboard or bodyboard rental
- k) Bike rental
- l) Boat fuel
- m) Ramp fees
- n) Bait and tackle
- o) Lodging (if you stayed overnight)
- p) Charter fee (whale watching, etc.)
- q) Museum, aquarium, or other entrance fee
- r) Lessons, clinics, camps
- s) One-day fishing license fee
- t) Hang glide rental

u) Other, please list:

Q17b. During your last visit to the South Coast of California, please estimate how much your party spent on the above indicated items and the number of people it covered.

Q18. In the South Coast of California a network of marine protected areas (MMPAs) were recently put in place. Before this survey, were you aware of these newly established MPAs?

- Yes
- No

## Appendix B. Coastal Recreation Map Products

This appendix presents South Coast coastal recreation “heat” maps created by the activity markers placed by the respondents of our recreational survey. As described in Section 3.3, survey respondents provided information by placing a point or marker on a map and then indicated which activity or activities they conducted at each specific location on their last trip (Figure 6). The spatial data are a combined set across all four survey waves accounting for seasonal variations in coastal recreation. Table 15 above indicates the number of markers placed per activity per survey wave for all activities.

While there were a total of twenty-eight activities mapped, this appendix contains eleven maps depicting the spatial patterns of use (distribution and intensity of use) across the region for coastal recreation overall and for the **top ten** select coastal recreation activities:

1. Beach going (sitting, walking, running, dog walking, kite flying, etc.)
2. Scenic enjoyment/sightseeing
3. Photography
4. Watching birds and/or marine life from shore
5. Biking or hiking
6. Sitting in your car watching the scene
7. Swimming or body surfing in the ocean
8. Collection of non-living resources/beachcombing
9. Surfing (board, boogie, stand up paddle, kayak)
10. Tide pooling

The additional maps not included in this summary report were included with our data deliverables upon submission of this report.

Figure 8. Spatial Patterns of Use - All Activities

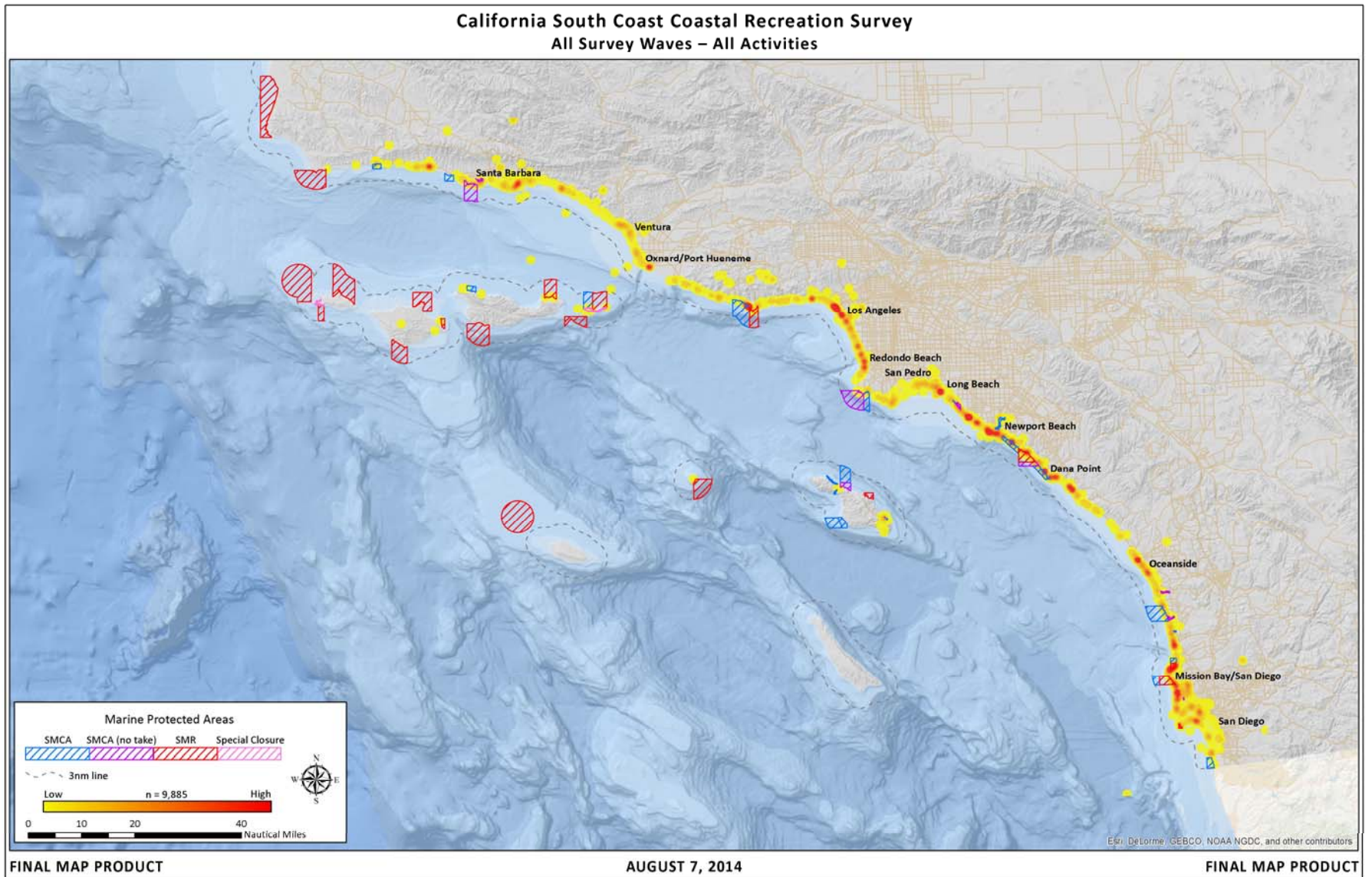


Figure 9. Spatial Patterns of Use - Beach Going

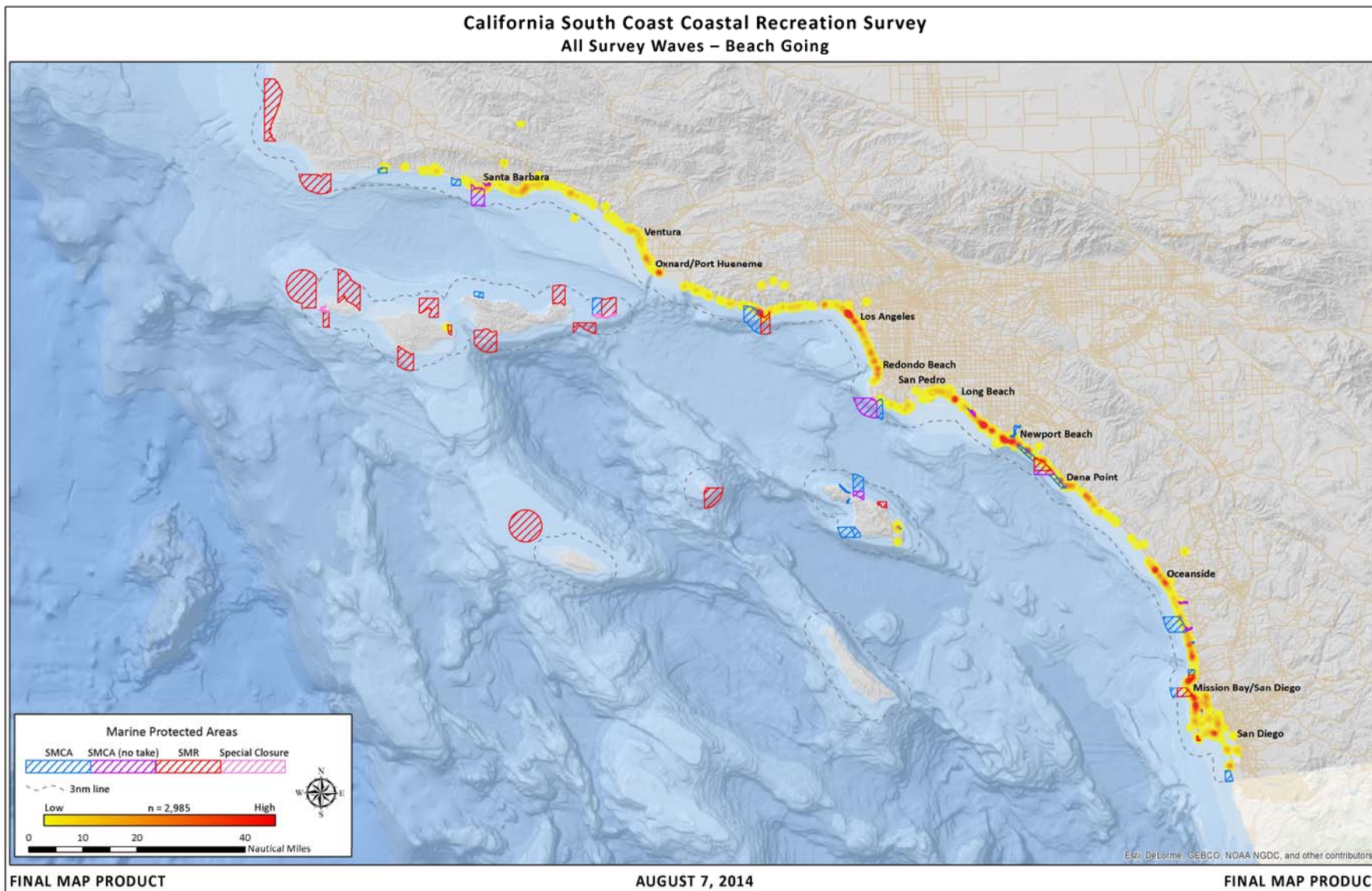


Figure 10. Spatial Patterns of Use - Scenic Enjoyment

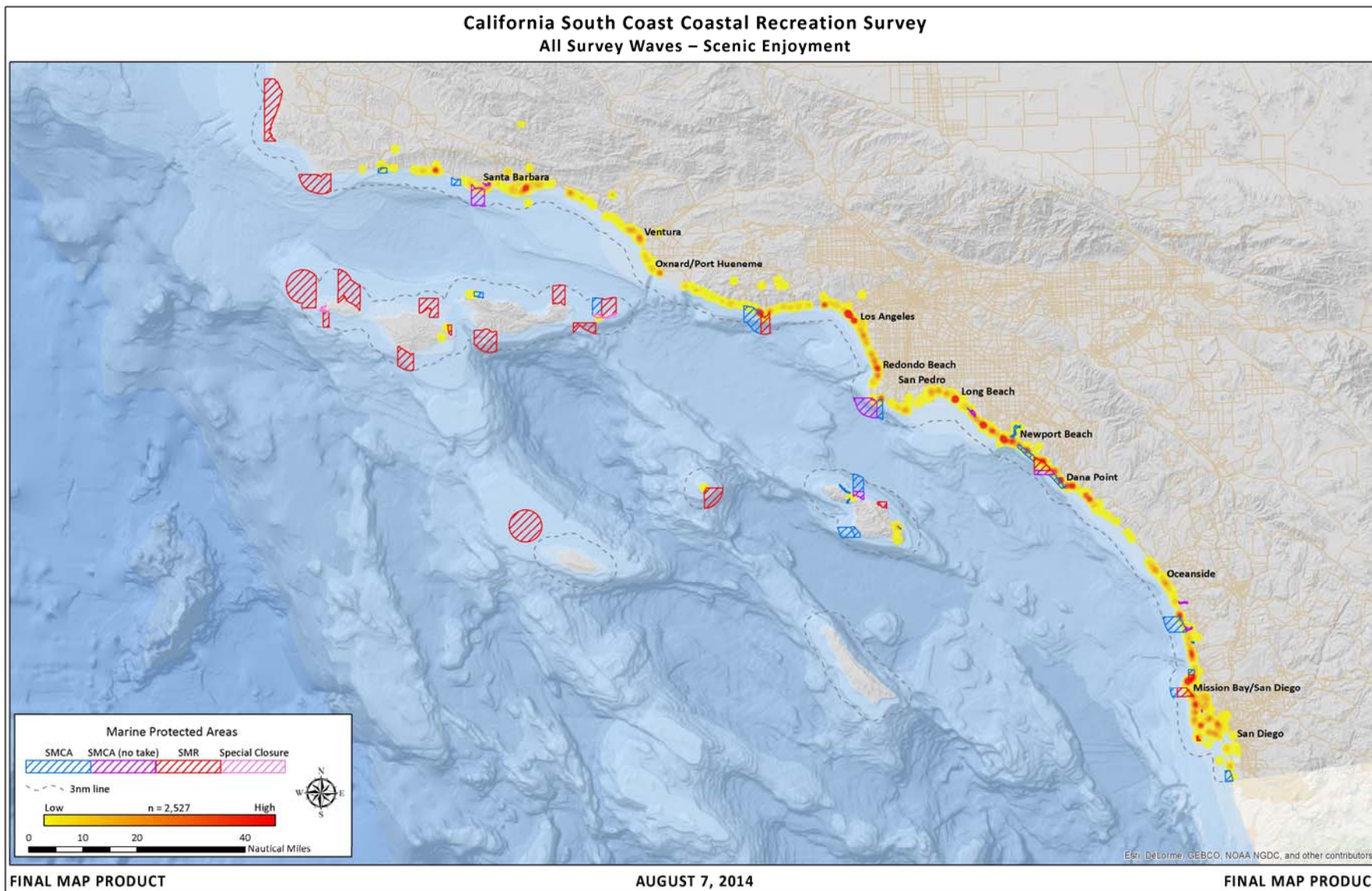




Figure 11. Spatial Patterns of Use - Photography

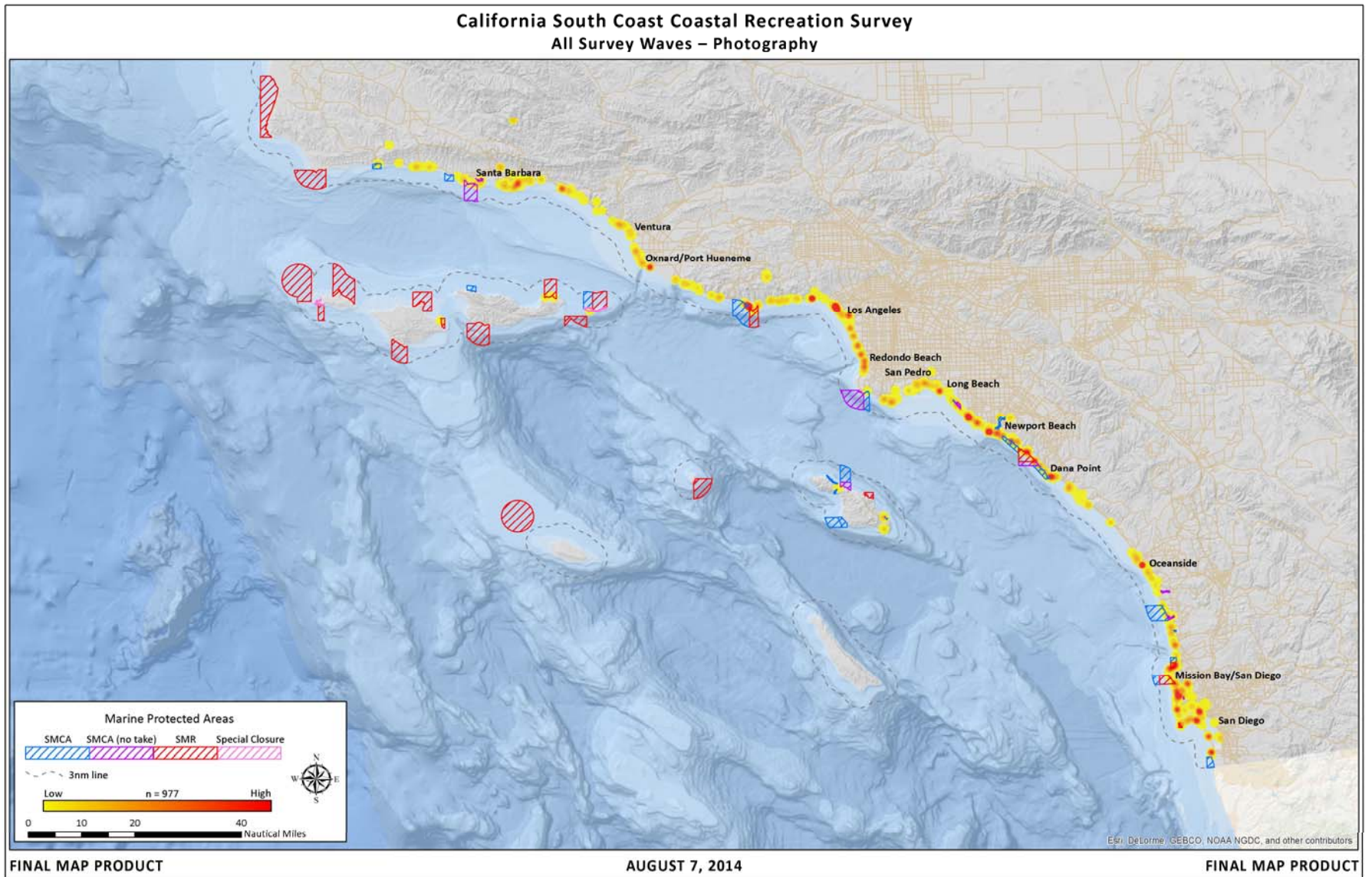


Figure 12. Spatial Patterns of Use - Birdwatching

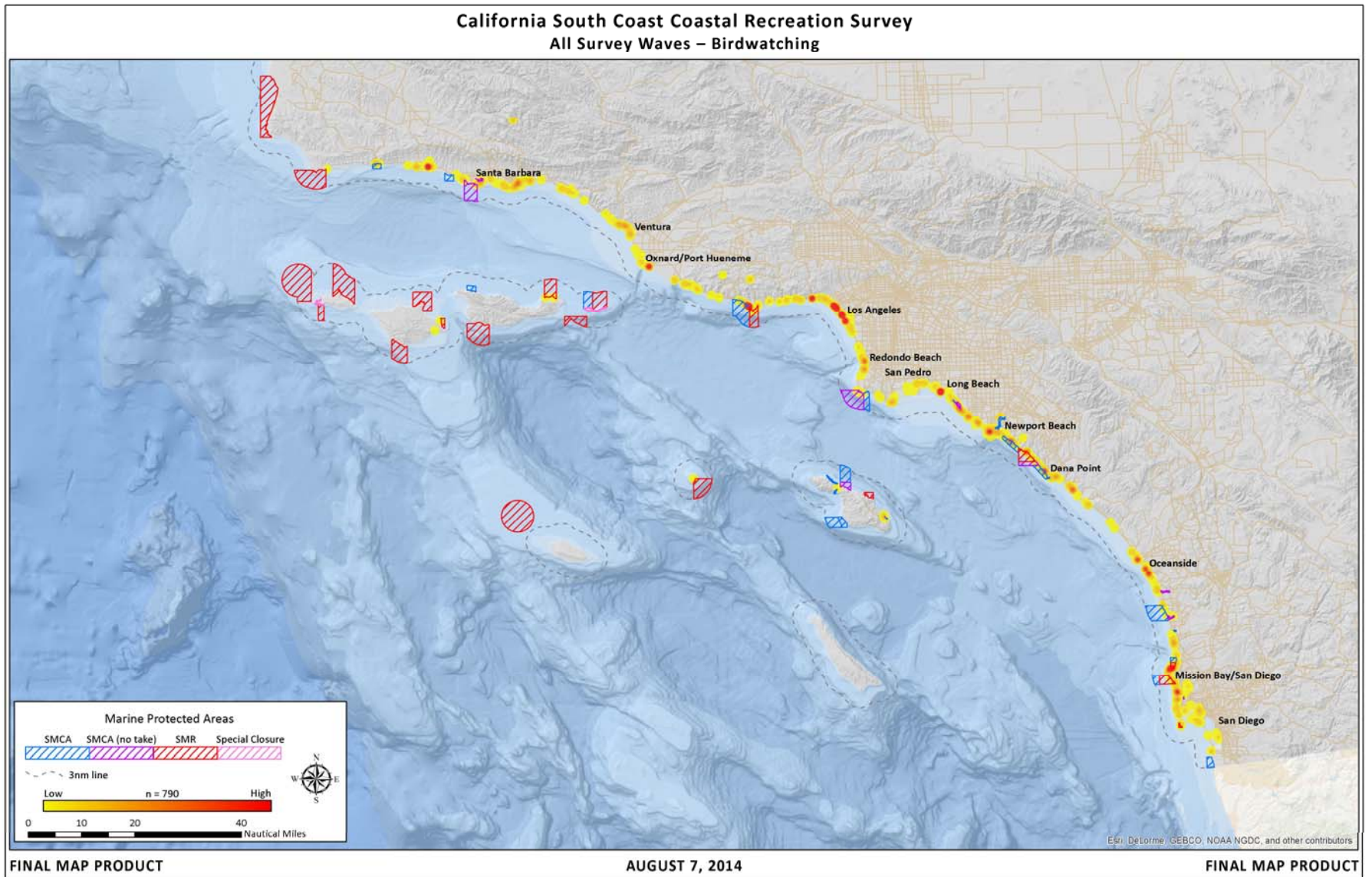


Figure 13. Spatial Patterns of Use - Biking and Hiking

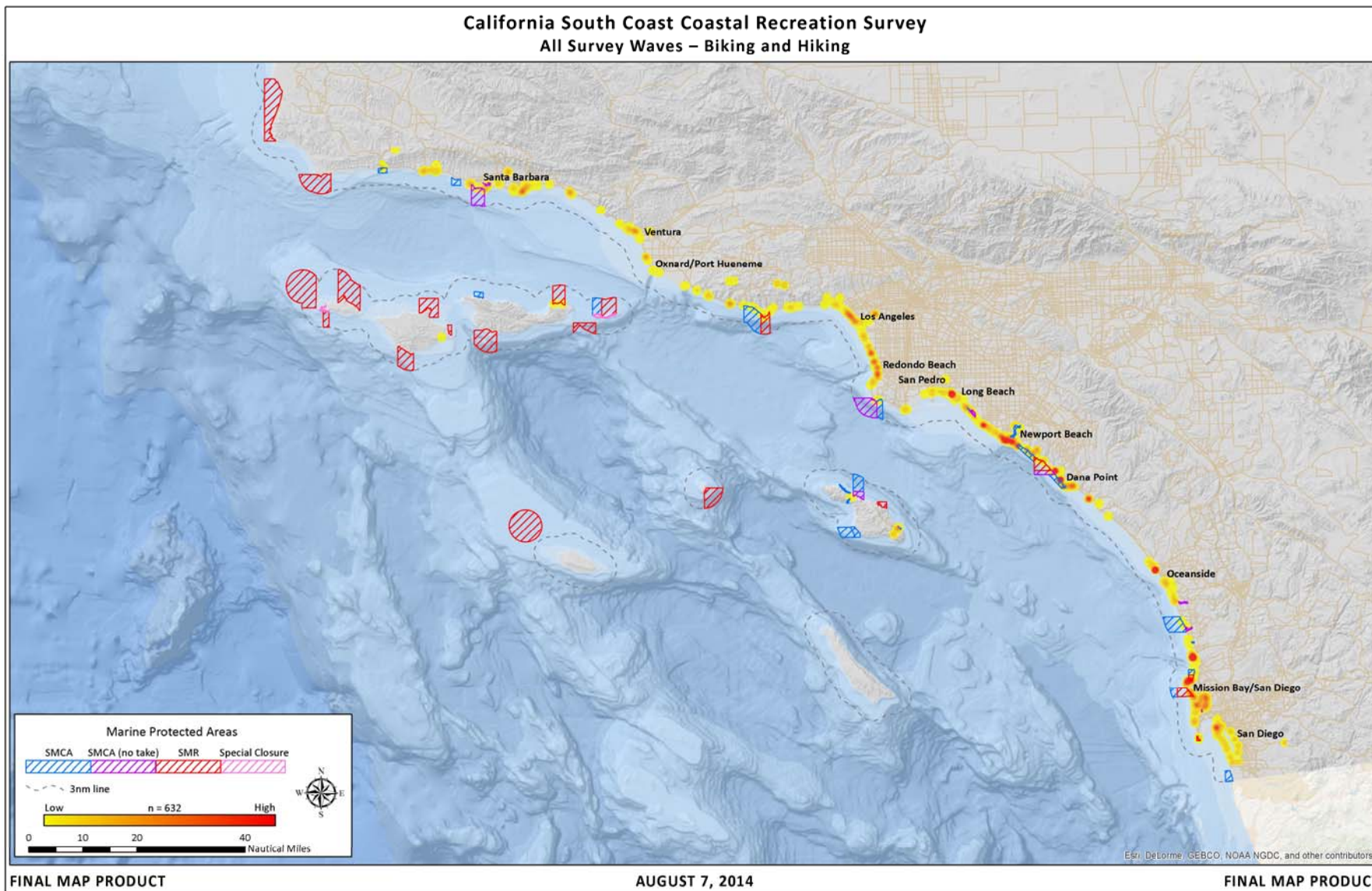


Figure 14. Spatial Patterns of Use - Sitting in Car Watching the Scene

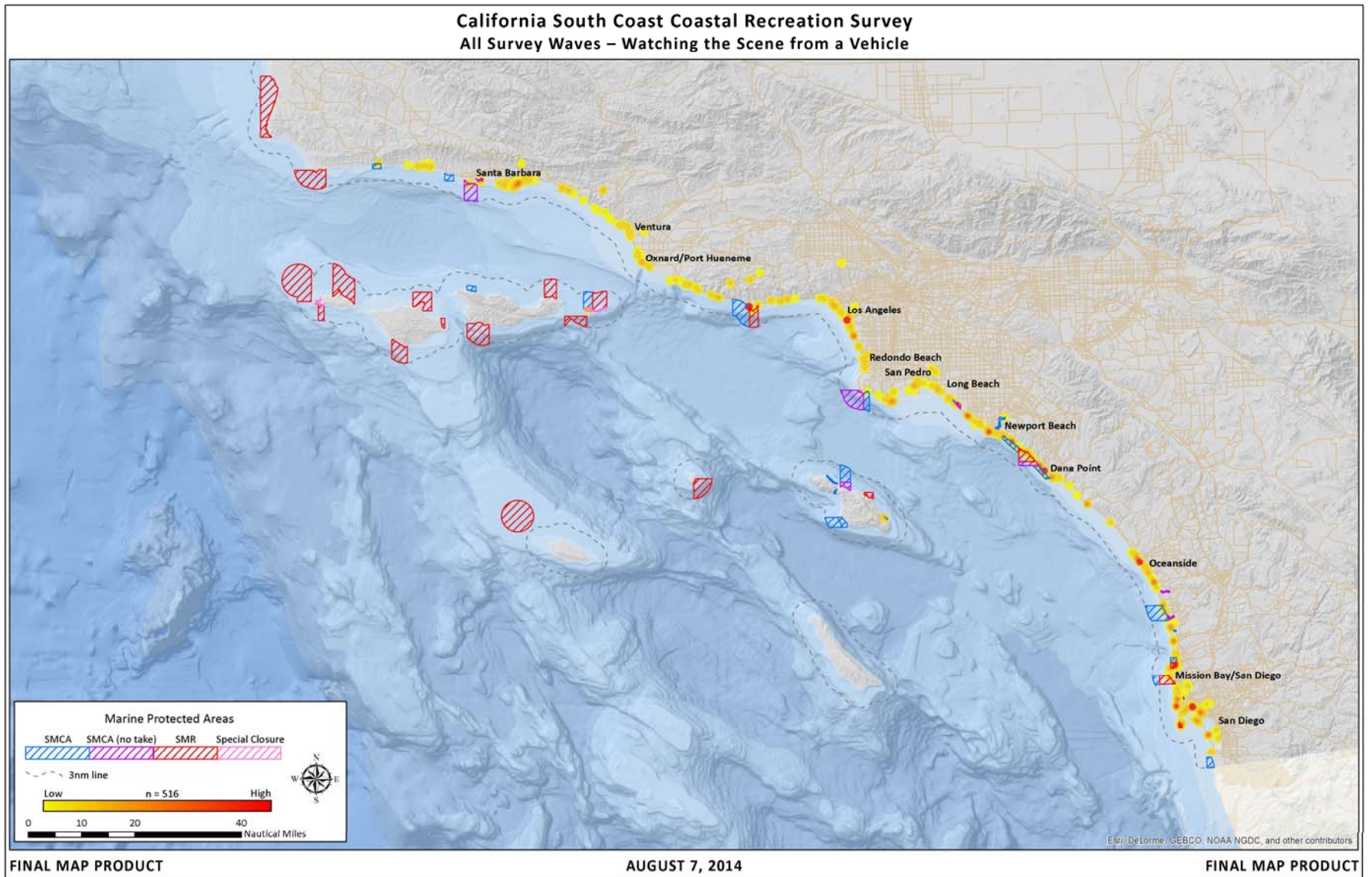


Figure 15. Spatial Patterns of Use - Swimming or Bodysurfing in the Ocean

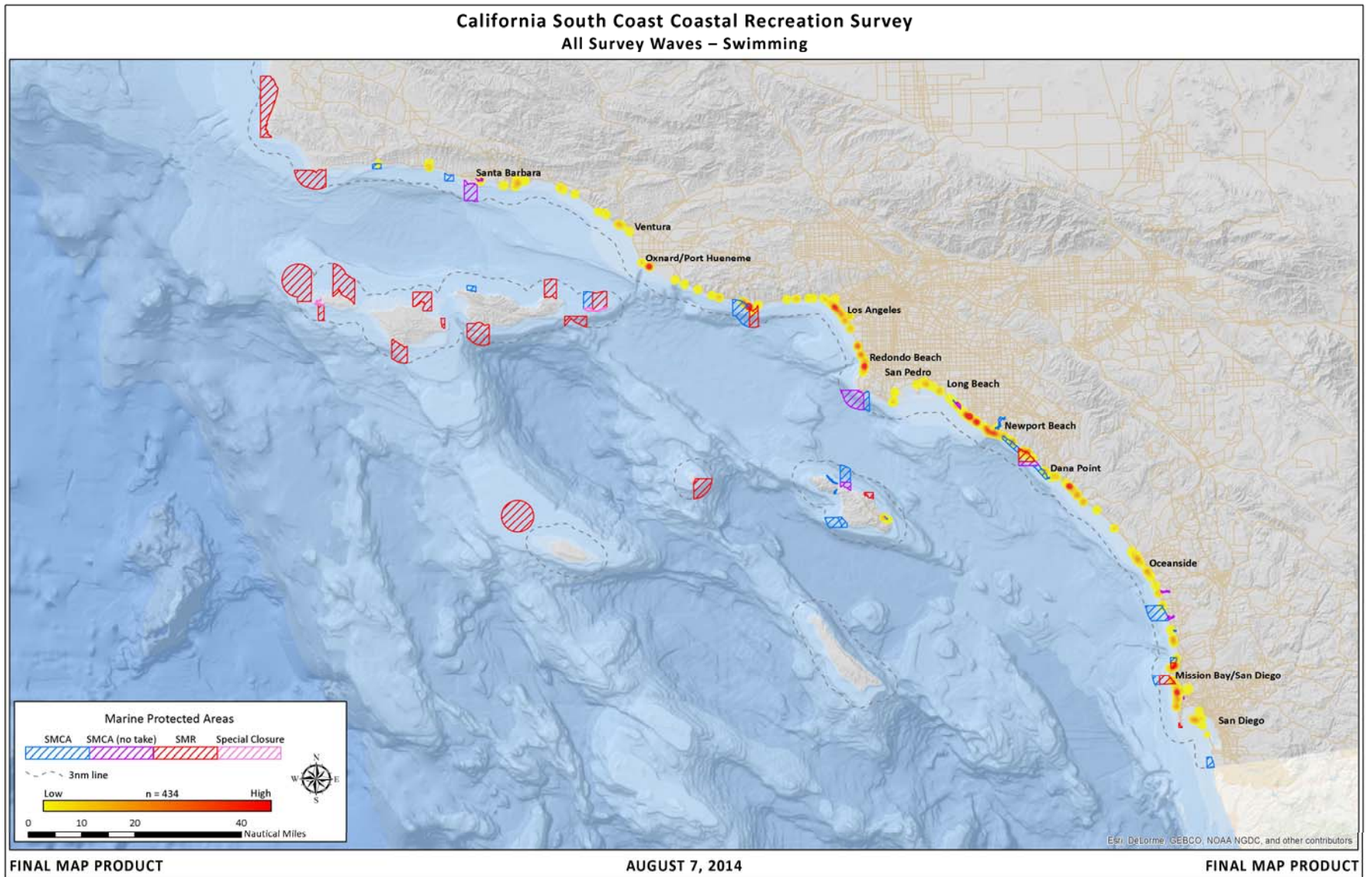


Figure 16. Spatial Patterns of Use - Beachcombing

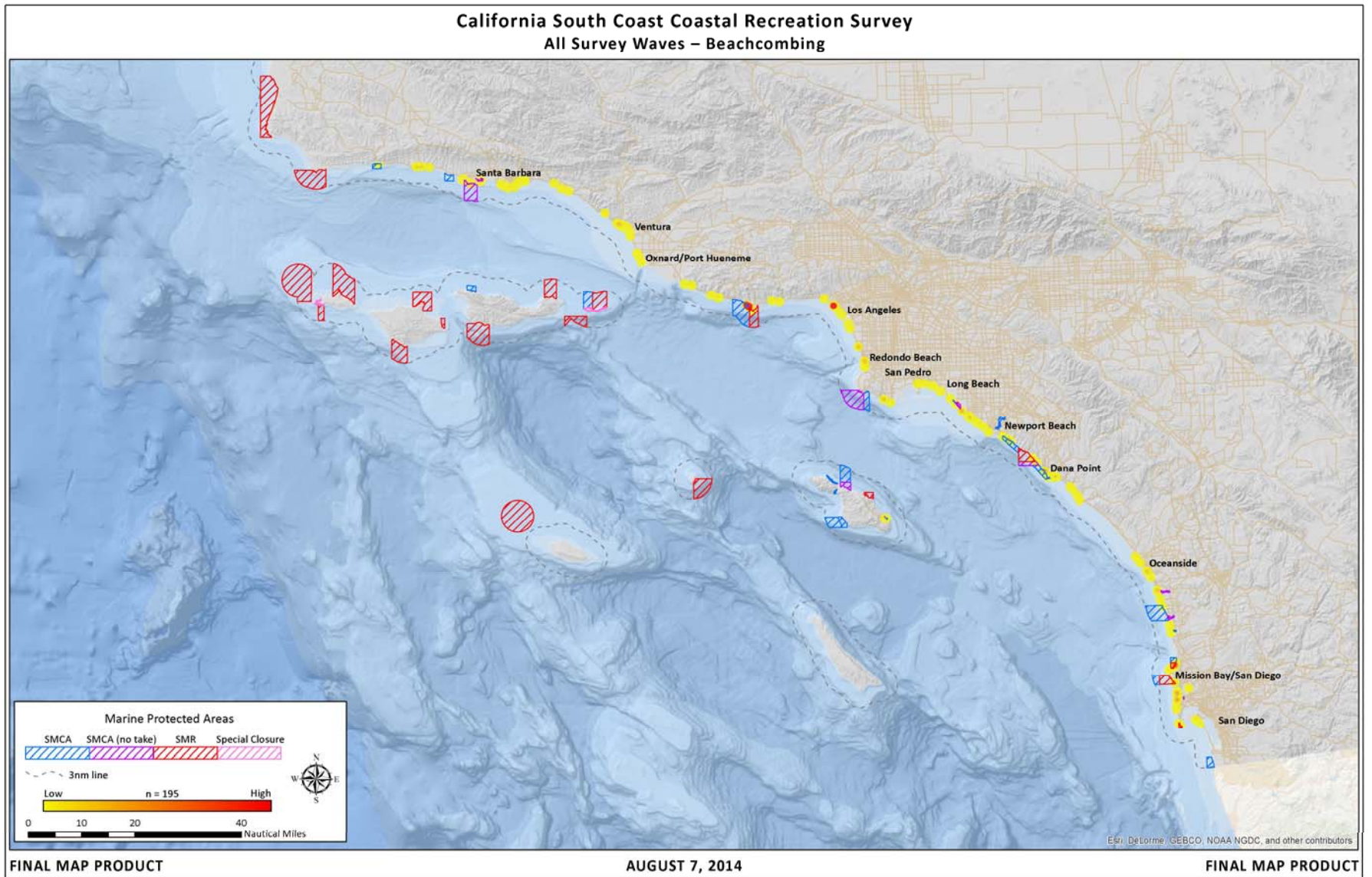


Figure 17. Spatial Patterns of Use - Surfing

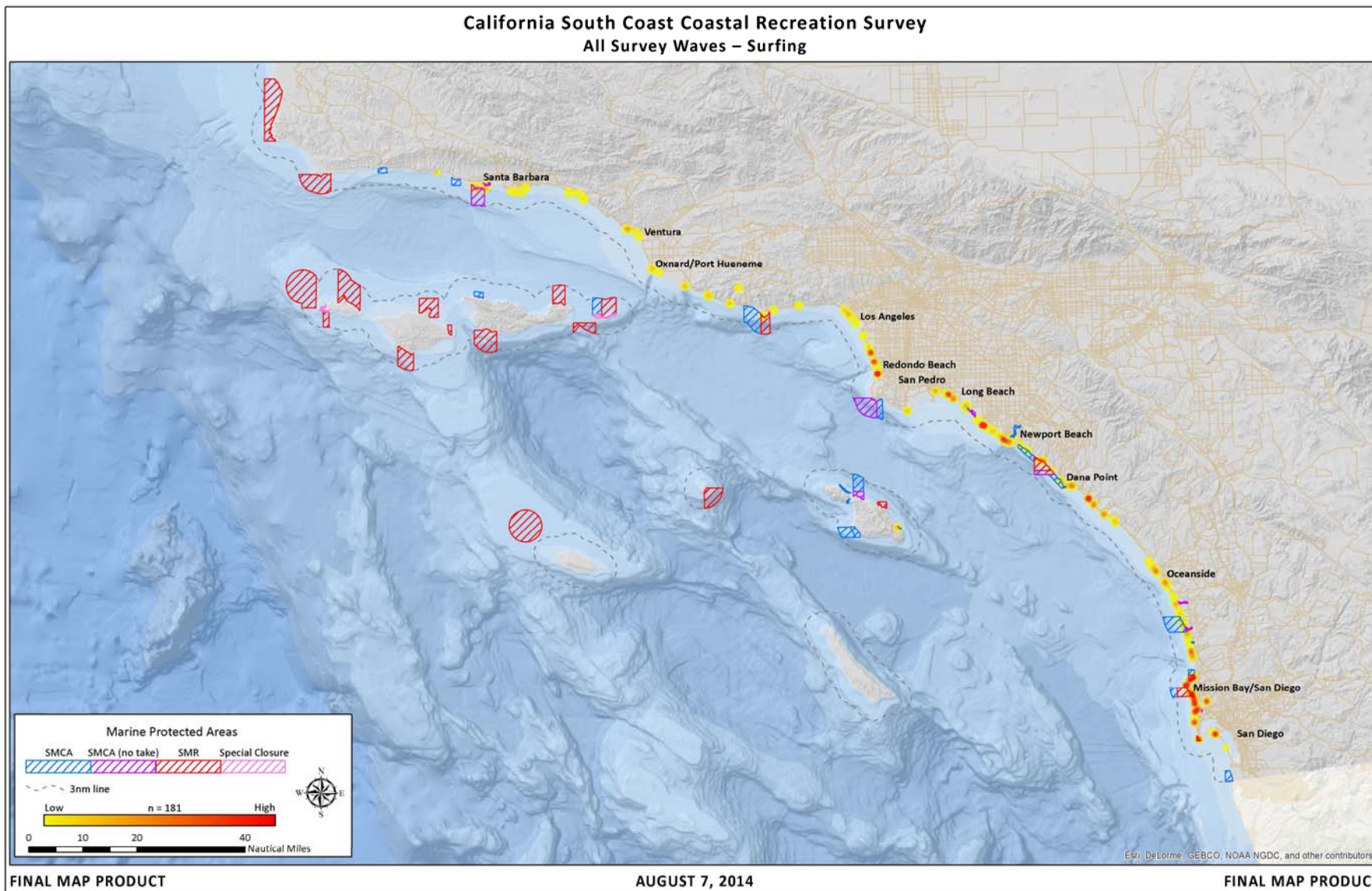


Figure 18. Spatial Patterns of Use - Tidepooling

