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California Coastal Recreation: Beyond the Beach

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Coastal Recreation in California: Beyond the Beach

Center for the Blue Economy
Middlebury Institute of International Studies at Monterey

November 2021



Middlebury Institute of
International Studies at Monterey
Center for the Blue Economy

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1. Executive Summary

. California is known throughout the state, nation, and world for its beaches, but the California coast provides so much more in recreational opportunities than just a day at the beach. However, if one were to ask: “How many people actually visit the coast for recreation”, the answer is “*No one really knows*”.

The reason is simple. No one asks this question on a regular basis. Extensive monitoring of the physical conditions of the coast and coastal waters takes place but nothing remotely comparable is done to track the millions of people who come to the coast.

Because there is no systematic, regular assessment of coastal recreation in California it is difficult to make decisions about current and future uses of the coast. These decisions include addressing such questions of how much of the coast to set aside for conservation purposes. California has an extensive network of Marine Protected Areas in addition to federal and local conserved lands and waters. Perhaps even more critically, climate change will alter the physical dimensions of the California coast in ways that may dramatically alter future human uses. Without a baseline, the impact of these changes on visitation can never be known.

This study is an effort to compile a picture of the uses and users of the California coast for recreation based on available information. It synthesizes estimates compiled from a variety of sources including past studies of recreation, data from public agencies, and many other sources. The focus of the report is on the recreational uses “beyond the beach” in order to emphasize the wide variety of uses across the length of the coast. The data covers different periods and different geographies and so is not always comparable across time and places, making summary measures difficult. Included in the report are recommendations for improving the measurement of coastal recreation

Principal conclusions of the report include:

- Over 50% of the California population likely visits the coast for recreation ever year.
- By far the most important form of recreation on the California coast is simply experiencing the coast whether from locations on land or in a boat
- The most popular uses of the coast are nonconsumptive uses, including not only beach going, but also recreation classified as “active”, such as swimming or boating, and recreation classified as “passive” such as scenic drives and photography.
- Southern California accounts for most coastal recreation if beaches are included, but Central and Northern California account for most non-beach uses and nonconsumptive uses.

- While State Beaches are quite popular, State Parks, which contain many different shoreline types in addition to beaches are more popular.
- We know, with reasonable accuracy, how many boats people own and where they are docked or moored, but boating activity is not tracked regularly. This is true both for self-owned boats and for hired boats, whether rentals and charters, dinner cruises in the harbor, or nature viewing boat trips.
- The highways with coastal views, in particular California's Highway 1, are a very important asset whether the sightseeing is a principal or an incidental purpose of a trip.
- Methods to expand data collection and improve precision of estimates are available that can greatly improve understanding of recreational uses, and which can be implemented at modest cost. Implementing these approaches and expanding the knowledge base of how many people use the coast for recreation, who the people are, and what they do for recreation is essential to the sustainable use of California's coast.

2. Introduction

Malibu

Big Sur

San Francisco Bay

San Diego Mission Bay

Point Reyes

These are among the iconic locations in coastal California, known, thanks to the movie industry, around the world. Because the coast is so well known, it is easy to assume that a great deal must be known about visits to the coast. But if one were to ask: “How many people actually visit the coast for recreation”, the answer is “*No one really knows*”.

The reason is simple. No one asks on a regular basis. Extensive monitoring of the physical conditions of the coast and coastal waters takes place, with data available on an hourly or daily basis.¹ But nothing remotely comparable is available to track the millions of people who come to the coast. Moreover, most attention is paid to beaches—the coastal resource seen as the center of the California “lifestyle.” To many people the beaches *are* California, yet even here there is only limited information about the number of visitors. But the coast is used for many different types of recreation beyond the beach, much of which is either not measured, irregularly measured, or imperfectly measured.

Because there is no systematic, regular assessment of coastal recreation in California it is difficult to make decisions about current and future uses of the coast. These decisions include addressing such questions of how much of the coast to set aside for conservation purposes. California has an extensive network of Marine Protected Areas in addition to federal and local conserved lands and waters. Perhaps even more critically, climate change will alter the physical dimensions of the California coast in ways that may dramatically alter future human uses. Without a baseline, the impact of these changes on visitation can never be known.

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¹ See the Southern California Ocean Observing Systems (<https://sccoos.org/>) and the Central and Northern California Ocean Observing System (www.cencoos.org)

wide variety of uses across the length of the coast. The data covers different periods and different geographies and so is not always comparable across time and places, making summary measures difficult. Included in the report are recommendations for improving the measurement of coastal recreation.

First, it is necessary to discuss a critical question: how are recreational uses and users counted?

3. What gets counted: people, trips, visitor days

There are several ways to measure people's use of the coast; each provides a different perspective, and all are used in one way or another in the studies and data used for this report.

- Population- the number of people who visit or use the coast at least once during a year for recreational purposes.
- Trips – the number of times a person goes to the coast per period. Trips can be of varying length, usually measured in days, but can be measured in hours.
- Person-trips – the number of people multiplied by the number of trips they take.
- Trip length- the number of days for trips, typically expressed as day trips and overnight trips. Overnight trips can be measured in the number of nights (of interest to the accommodations) or the number of days. A one-night trip would equate to two days, a two-night trip to three days, etc.
- Person or visitor days- the number of days for a trip multiplied by the number of people taking the trips.
- Visitors, Tourists – There are several definitions of visitors or tourists, who are distinguished from residents who take advantage of the recreation opportunities of the coast. A common industry definition is people who travel a minimum of 50 miles (80 kilometers) from their home. But other definitions are possible. Residents of California or of specific regions within California (e.g., "Southern" California) might be distinguished from visitors from outside of California or outside of Southern California.

4. Top Line: People, Trips, Days, and Regions

The most comprehensive assessment of recreational use of the California coast was a series of two reports prepared for the California Coastal Conservancy, an agency of the State of California, by the firm Ecotrust. (Chen et al. 2015; 2013) The studies were published in 2013 and 2015. There were large scale online general population surveys of the populations of Northern and Southern California. The general population survey allowed identification of those people who visited the California coast at least once in the previous year. The regions of the survey are shown in Figure 1.

Figure 1 Regions Surveyed in Chen et al (2013 and 2015)



These studies surveyed populations primarily in the coastal counties but added populations in nearby inland counties. The populations surveyed excluded the residents of most interior counties as well as the populations of Monterey, Del Norte, and Humboldt

counties. The survey covered 22 of the 58 counties, which comprised 85% of the California population. For purposes of summarizing the data in this report the three “other” coastal counties were added and assumed to be similar to the “Northern Region”.

Estimates of visitors in the earlier studies were based on the 2010 populations of these counties. For purposes of the present study, the population base of each county was adjusted to the 2019 levels using the Bureau of the Census annual population estimates. 2019 is the last year for which full data was available at the time of this study. Moreover, 2020 recreational trends were clearly distorted by the Covid pandemic, so that year would not have provided a meaningful year for analysis even if the data were available. The impact of Covid on recreation is an important issue, but it warrants a separate study.

Using this base, we estimate the number of people who visited the California coast for recreation in 2019 as follows:

Coastal Region Visited	Coastal Region Resident
Northern California	5,708,838
Southern California	13,031,095
Other Coast	322,922
Total	19,062,854

Table 1 California Residents Visiting the Coast 2019
Source: CBE Estimates based on Chen et al (2013 and 2015)

These estimates indicate that just under half (48%) of the California population in 2019 visited the coast at least once every year for recreation. This is an *underestimate* because the populations from the 33 interior counties not surveyed were not included. Residents of these counties do live some distance from the coast, but some portion of them undoubtedly visit the coast for recreation. If even 15% of the population of these interior counties visited the coast for recreation, the total would be over 50% of the California population visiting the coast for recreation.

Coastal Region Visited	Average Annual Trips	Total Annual Trips	Avg Length of Trip (Days)	Number of Visitor Days
Northern California	2.8	15,875,136	1.1	6,279,721
Southern California	7.1	93,042,015	2.1	27,365,299
Other Coast	2.8	897,982	1.1	355,214
Total		109,815,133	1.95	34,000,234

Table 2 Trips and Visitor Days
Source: CBE Estimates based on Chen et al (2013 and 2015)

Table 2 extends the analysis of the coastal recreation population to look at the number of trips and visitor days. The CCC surveys asked about the number of trips to the coast and the average length of trips. Converting the annual average number of trips and the average length of the last trip to total population levels yields an estimate of 109.8 million trips in 2019.² The largest number of coastal trips was in the southern region, with more than five times as many trips per year as in the northern region.

The average number of days for each trip is estimated at slightly less than 2 days; this is because trips to the southern California coast were about twice as long as to the northern California coast and the larger population in southern California pulls the average trip length up. Note, however, that these trip length estimates are derived from the last trip taken to the coast, while previous trips may have been of other lengths.

5. What do they do at the coast?

As part of the survey of California residents for the California Coastal Conservancy survey, respondents were asked about their activities when they visit the coast. Respondents could give multiple answers, since on any give trip people may undertake multiple activities. The percentages for each activity are shown in Table 3. The individual activities that could be chosen are grouped into major categories for purposes of discussion.

Note that adding up the percentages reported by respondents who selected a given activity creates the possibility of percentages adding up to more than 100. This is a necessary byproduct of multiple answer questions and should be seen as an indicator of extensiveness of activity.

Activity	Southern California	Northern California
Active	29.7%	39.6%
Biking or hiking	29.3%	39.3%
Hang gliding/parasailing	0.4%	0.3%
Beach	111.2%	83.4%
Beach going (sitting, walking, running, dog walking, kite flying, etc.)	75.0%	65.2%
Skim boarding	1.6%	1.7%
Surfing (board, boogie, stand up paddle, kayak)	8.4%	3.7%
Surfing (tow-in)	0.5%	0.4%
Swimming or body surfing in the ocean	25.2%	11.8%
Windsurfing	0.5%	0.6%
Boating	13.8%	12.0%

² Based on the survey sampling error of $\pm 5\%$, the likely estimate is between 104.3 and 115.3 million trips.

Activity	Southern California	Northern California
Kayaking in the ocean or estuary/slough	5.1%	5.0%
Kite boarding	0.4%	0.6%
Power boating	3.7%	2.4%
Sail boating	3.0%	2.7%
Using a personal watercraft (jet skis)	1.6%	1.3%
Diving	2.7%	3.9%
Diving (picking or spear fishing) from a boat/kayak	0.3%	0.6%
Diving (picking or spear fishing) from a shore	0.8%	1.4%
SCUBA diving (from shore, from boat)	1.6%	1.9%
Fishing	19.5%	22.0%
Collecting/picking/harvesting sea life from shore (clamming, seaweed, mussels, etc.)	3.8%	4.3%
Fishing (hook and line) from a boat/kayak	4.6%	4.8%
Fishing (hook and line) from pier/shore	7.6%	7.2%
Free diving/snorkeling (from shore, from boat)	2.6%	2.4%
Trap/net from boat/kayak (lobster/crabbing)	0.4%	0.9%
Trap/net from pier or shore (lobster/crab)	0.5%	2.4%
Nature	23.6%	15.1%
Collection of non-living resources/beachcombing (agates, fossils, driftwood)	9.1%	15.1%
Tide pooling	14.5%	
Nonconsumptive	131.9%	193.3%
Photography	25.1%	41.0%
Scenic enjoyment/sightseeing	58.2%	77.1%
Sitting in your car watching the scene	26.1%	36.6%
Watching birds and/or other marine life from shore (e.g. whale or seal watching)	22.5%	38.6%

Table 3 Coastal Recreational Activities

Source: Chen et al (2013 and 2015)

Not surprisingly, going to the beach is a major attraction in southern California, with 75% of respondents indicating they go to the beach. A third of those who go to the beach go swimming, with surfing undertaken by about 9% of southern California regional coastal recreation users. Also not surprisingly, going to the beach is still popular in northern California, but not to the extent of southern California. Swimming is less popular with only a little more than 10% of visitors to the northern California shore swimming.

While the data confirms the importance of the beach in California coastal recreation, it also shows that by far the most frequently noted form of recreation on the California coast is simply experiencing the coast whether from locations on land or in a boat. The largest reported activities are in nonconsumptive uses such as photography, sightseeing, bird watching or

exploring tide pools, with a total of 193.3% indicating that, on average, the typical respondent engages in close to two of these activities, with scenic enjoyment/sightseeing being the most important activity, though photography, sitting in your car, and bird/whale/seal watching are also popular. Boating is also very popular, with kayaking reported as having higher participation in both southern and northern regions, lagging both power boating and sailing.

Recreational fishing of all types has a small proportion of users, with fishing from a pier the most popular form in both northern and southern regions. Recreational fishing is a difficult activity to classify in terms of consumptive or nonconsumptive use; sometimes catch is kept for food and sometimes it is released.

The results from these two surveys provide a good overview of the number of people who engage in coastal recreation and what they do there. But these surveys have not been repeated and they leave out substantial details. Other data sources can provide more regular data, but still with significant limits. The next sections provide additional details on popular recreation locations as well as additional details on popular recreational activities with a particular focus on the “experience” activities that are perhaps less well known but actually form the heart of coastal recreation in California.

6. California State Parks and Related Lands

California has invested in an extensive array of recreational areas throughout the state. California Parks owns and operates a diverse array of facilities, 71 of which are in coastal areas. There are a number of different types of state parks properties. In coastal counties these include state beaches, forests, historic monuments and parks, natural reserves, recreation areas, marine parks, and state parks. (Table 4). Average annual visitation across these 71 facilities was 456,000 in 2019. Note that the reported data is for visits, not people; many people visit multiple parks and on multiple days throughout the year.

Table 4 Visits to California State Parks in Coastal Areas

	Annual Attendance	Number of Facilities
State Beaches	5,922,096	12
Central Coast	2,889,590	6
Northern	377,507	3
Southern	2,654,999	3
State Forests	60,152	1
Northern	60,152	1
State Historic Monuments	404,234	1
Central Coast	404,234	1
State Historic Parks	421,294	3
Bay Area	167,632	1

	Annual Attendance	Number of Facilities
Central Coast	206,367	1
Northern	47,295	1
State Natural Reserves	692,504	4
Bay Area	32,539	1
Central Coast	524,613	2
Northern	135,352	1
State Recreation Areas	184,202	2
Bay Area	158,920	1
Northern	25,282	1
State Parks	24,445,301	47
Bay Area	8,762,505	10
Central Coast	6,589,818	14
Northern	3,995,325	15
Southern	5,097,653	8
State Marine Parks	237,955	1
Central Coast	237,955	1
Grand Total	32,367,738	71

Source: California Department of Parks and Recreation

California's State Beaches are certainly the best known of the coastal recreation facilities, and with an estimated 6 million visitors in 2019, the reputation is well deserved.³ Visits to state beaches in southern California were led by Huntington Beach with 2.1 million visitors and a total of almost 2.7 million across all state-owned beaches in Southern California are the best known. This estimate for state beaches, however, considerably underestimates the number of beach visitors, particularly in Southern California where locally owned beaches comprise as much or more coastline than state beaches. Unfortunately, while estimates of users of state beaches are known to likely have higher error rates, accurate information on use of locally owned and operated beaches is almost entirely lacking.

In 2019 more people visited the state beaches of the Central Coast, led by Asilomar State Beach in Pacific Grove with just over 1 million visits and Carmel River State Beach with 940,000 visitors. The Central Coast beach visitors total 2.9 million compared with the southern state beaches total of 2.7 million.

But the beaches accounted for only 18% of visitors to coastal state owned coastal recreational lands. Seventy five percent of visitors were to state parks where beaches were not

³ Estimates of visitors are provided for each state park, but the process of estimation is subject to significant possible error. See the discussion below.

the principal feature. Visitors to state and federal parks in the San Francisco Bay Area (8.8 million visitors) and the Central Coast (6.6 million visitors) both exceeded parks in the southern area. The most visited parks in coastal California are Sonoma Coast and Tomales Bay⁴ in the Bay Area at 3.4 million visitors each. Those looking for the least crowded coastal state park can visit Harmony Headlands in San Luis Obispo County, where there were only 6,500 visits in 2019.

California provides many other public recreational facilities in coastal areas. Counties provide park facilities at 40 locations, though not all counties have coastal parks. (Table 5) Humboldt and Marin counties lead with seven parks. Unlike state parks, however, attendance data is much harder to obtain. Attendance data was available for Sonoma County Parks, which showed 2019 attendance of 1.3 million, led by Doran County Park with 1 million visitors.

Table 5 County Parks in Coastal Counties

County	Number of Parks
Del Norte	1
Humboldt	7
Sonoma	4
Marin	7
San Francisco	2
San Mateo	4
Santa Cruz	5
Santa Barbara	4
Ventura	1
Orange	2
San Diego	3
Total	40

It should be noted that the figures in Table 4 only account for beaches in the California State Parks system. It does not cover county parks (see below) or local parks, many of which are themselves extensive stretches of beach. The Huntington City Beach likely receives as many visitors as the State Beach located adjacent. However, no use data for the local government-provided beaches are available, so the precise dimensions of beach use are not known. The ratio of non-beach user to beach user in the state parks data may be much closer to one to one if all recreation were counted.

7. Recreational Fishing

⁴ Tomales Bay is located on the Pacific side of Marin County. For consistency with county-based data used elsewhere, Marin County is included in the Bay Area.

Marine fishing is an important recreational activity for a small but dedicated portion of California residents. The 2013 and 2015 surveys for the Ocean Protection Council found about one fifth of California residents engage in some type marine fishing or collecting marine species, with slightly higher proportions in Northern California (22%) than Southern California (19.5%). Fishing is one of the few recreational activities that may require a license to undertake, which should allow a regular assessment of its popularity. Unfortunately, the California fishing license system is not well equipped to make this assessment because it counts licenses, not people and because there are a circumstances where no license is required.

California does not require separate licenses for marine and inland fishing, as some states do. A fishing license, whether annual, daily, or lifetime, permits fishing in fresh or salt water. No license is required, however, for fishing from piers and docks. There are special licenses for disabled veterans and for low-income people. Except for angling for specific species, no record of the number of fishing days is made. Despite these weaknesses in the licensing system, some observations about marine recreational fishing are possible.

Figure 2 Number of Resident Fishing Licenses of All Types

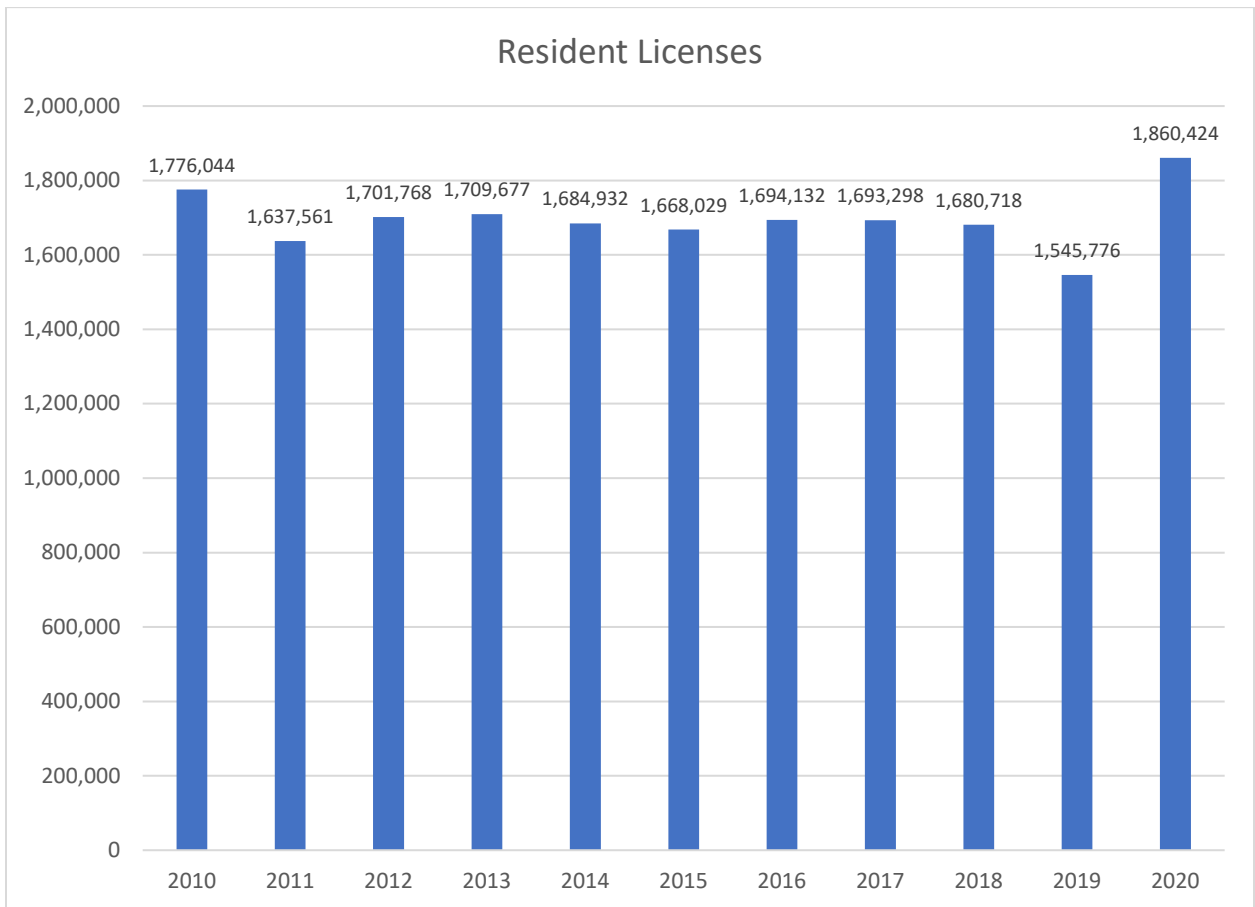


Figure 2 shows the number of resident fishing licenses of all types issued by the California Department of Fish & Wildlife from 2010 to 2020. The total averages 1.7 million per year, although 2019 and 2020 were notable exceptions to the trend with a sharp drop of 135,000 from 2018 to 2019 followed by 20% growth in 2020 over 2019. It is unclear what the cause of the drop in 2019 was nor of the growth in 2020, although it seems likely that the 2020 growth was enhanced to some extent by a desire to get outside during the pandemic conditions.

Table 6 refines the geographic analysis in the Coastal Conservancy surveys somewhat. This shows the number of annual plus lifetime resident fishing licenses of all types⁵ by region. The regions in this analysis include all coastal counties including creating a Central Coast region comprising San Luis Obispo, Monterey, and Santa Cruz counties. These regions also differ from the OPC survey regions in that inland counties are counted separately from coastal counties. This distinction is important because it is likely that residents of coastal counties are more likely to use their recreational fishing license in salt water while residents of non-coastal counties are more likely to use their license in fresh. This is not a hard distinction of course because anglers are free to travel to whatever waters they choose. But it is important to observe the patterns in coastal counties more closely.

Table 6 Annual + Lifetime Fishing Licenses by Region

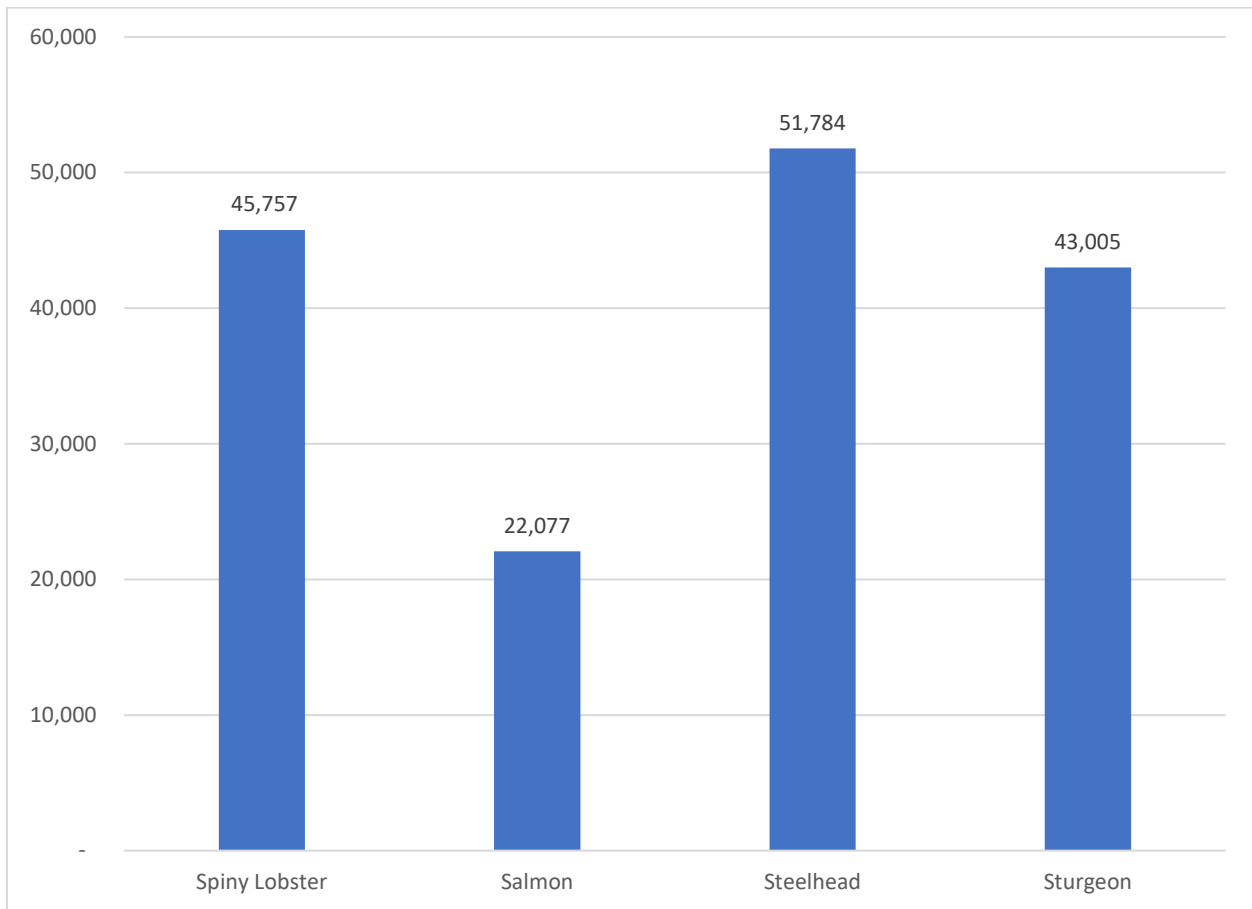
	Total Licenses	Population	Percent with Licenses	Percent of Licenses	Percent of Population
Central	49,289	987,584	5.0%	3.6%	2.5%
Non-Coastal	621,485	11,390,325	5.5%	45.6%	28.7%
Northern	34,493	386,763	8.9%	2.5%	1.0%
San Francisco Bay Area	309,837	8,945,152	3.5%	22.8%	22.6%
Southern	346,379	17,939,114	1.9%	25.4%	45.2%
Grand Total	1,361,483	39,648,938	3.4%	100.0%	100.0%

Overall, the Non-Coastal counties account for 29% of the California population but 46% of the fishing licenses issued. In the coastal counties, the northern counties have the highest proportion of their population with fishing licenses at nearly 9%, but these more sparsely populated counties do not affect the overall coastal county totals significantly. The major urban coastal areas in the Bay Area and Southern California have the smallest proportion of their populations with fishing licenses. However, license holders are likely to fish in the ocean to a significant degree. There is a special validation for ocean fishing required for fishing south of Port Arguello in Santa Barbara County. This ocean fishing permission is held by 308,000 license holders or about half of license holders of all types (resident and nonresident).

⁵ Table 6 does not include single or multi-day licenses or certain types of licenses for veterans and the military

Another indicator of fishing activity are the special reporting requirements for those who fish for spiny lobsters and for the anadromous species of salmon, steelhead, and sturgeon. Anglers who catch these species are required to report their catch to the Department of Fisheries & Wildlife on special reporting forms. This requirement exists for monitoring fish effort as part of conservation programs. There were over 160,000 licenses which reported catch of the listed species in 2019, with the majority (72%) being for the anadromous species. Steelhead trout is the largest reported species, although the second most common reported species was lobster. Steelhead are primarily a southern California species (south of Monterey Bay).

Figure 3 Licenses with Special Reporting Requirements (2019)



Source: California Department of Fish & Wildlife

Marine recreational fishing has an aspect to it that is somewhat unique, which is that fishing may be a recreational activity, or it may be a source of food to a significant degree, generally for lower income or for specific cultural communities. Many anglers may keep and eat their catch on a regular basis, but when fishing takes place on a frequent basis and the catch is always or almost always consumed, fishing becomes a part of household income as fishing becomes in effect, labor. This is especially true of pier fishing

The State of California allows residents and nonresidents to fish without a license for free on all public piers as well as some jetties. Those fishing must obey the same limitations on the number of fish that can be caught as those with licenses. Given that this activity does not require a license, data on the number of people who participate in pier fishing is more limited. Fortunately, a few studies have examined pier fishing, mostly in southern California. The two most detailed studies focused on Santa Barbara County and Los Angeles County

The Los Angeles study interviewed just over 3000 anglers in 2008-2009. (Stevenson, C., Sikich, S.A. and Gold 2012) Some of the key conclusions:

- “The pier angler community is demographically distinct from the commercial and recreational angling communities; 78% of respondents only fish from piers (never from boats), they do not have licenses, and they primarily speak English as a second language.”
- 60.4% of respondents identified as “Latino,” 15.4% White, 8.5% Filipino, 8.2%, African American 8.2%
- 56% were unfamiliar with Marine Protected Areas (MPAs)

A similar study of pier fishing was conducted in Santa Barbara County (Quimby, B., Crook, S.E., Miller, K.M., Ruiz, J. and Lopez-Carr 2020). This study found that:

- 88% of respondents reported their annual household income was below the median household income.
- 41% of respondents identified as “Latino,” 27% White, 21% Asian Pacific Islanders
- When asked “what is important about the experience” when fishing, 89% stated relaxing was important and nearly as many (82%) stated that “enjoying nature” was important.
- 52% stated that pier fishing was “an important source of food”

8. Boating

Boating is a popular activity throughout California’s coast, particularly in the region south of Point Concepcion as well as in and around San Francisco Bay. About 7% of California households own a boat of some kind, though this is a smaller number than 11% of households nationally with boats according to the National Recreational Boating Safety Survey conducted for the U.S. Coast Guard (RTI International 2020). This annual survey provides a significant amount of data at the state level regarding boating activity and safety issues but does not differentiate between coastal and noncoastal uses.

Rough estimates of boating activity can be derived from registration data from the Department of Motor Vehicles and a study of non-motorized boating conducted for the Department of Boats and Waterways (DBW). (Department of Motor Vehicles 2019; NewPoint Group 2009). The latter study reported on surveys conducted in 2007 covering activity in 2006.

Non-motorized	1,822,693
Motorized/ Pleasure	656,557
Total	2,479,250

Table 7 Estimate of Recreational Boats in California (2019)
Source: California Department of Boats and Waterways

Table 7 shows estimates of the number of recreational boats in 2019. The data in this table for motorized boats is based on DMV registrations. The estimates of non-motorized boats are derived from the estimates from the 2009 study of non-motorized boats updated to 2019 levels based on growth in the California population.⁶ The total is just under 2.5 million boats, 74% of which are non-motorized. California DMV records showed 656,000 active registrations for power boats⁷. This is largely consistent with the National Survey data showing 663,000 powered boats in California. (Table 8)

Table 8 shows the types of motorized boats registered in California in 2018 from the National Survey data. Almost 70% of powered boats are open or cabin power boats, with personal watercraft (jet skis) third. If all powered-only boats are combined, the share exceeds 95%. Sailboats, which may have auxiliary power, are only 5% of registered boats. Cabin power boats and sailboats are more likely used in coastal waters, open power boats and personal watercraft are split at some unknown level between coastal and inland waters; and personal watercraft are more likely on inland waters.

Boat Type	Number	Percent
Open Power	396,000	59.7%
Cabin Power	63,000	9.5%
Pontoon	23,000	3.5%
Personal watercraft	150,000	22.6%
Sailboats	31,000	4.7%
Total	663,000	100.0%

Table 8 Types of Registered Boats in California
Source: National Survey of Recreational Boating

For nonmotorized boats, the survey for the Department of Boating and Waterways showed the distribution of various types (Table 9). This survey results show substantially more nonmotorized boats for California than the data in the National Boating Survey, which reported a total 670,000 nonmotorized boats. The difference is likely due to sampling methods; the Coast Guard survey likely under sampled owners of non-motorized watercraft as they are less likely to be operated in areas of Coast Guard jurisdiction. As Table 9 shows, the largest proportion of the nonmotorized types is inflatables of various types (except inflatable kayaks which are

⁶ This assumes that boating ownership and activity retained a constant share of the population

⁷ A boat may be registered but not active if the annual fee is not paid.

counted as kayaks), followed by kayaks, canoes, rowboats, and sail/kite boards. Small sailboats in this classification are one design classes without auxiliary power that are generally launched from trailers or shore. The study of nonmotorized boats does not show a breakdown between coastal and noncoastal uses. In general, sail/kiteboards and kayaks are somewhat more likely to be used in coastal waters, while canoes and small sailboats may be more likely in inland waters.

Inflatable	756,299	41.50%
Kayak	577,449	31.70%
Canoe	203,560	11.20%
Rowboat	170,853	9.40%
Sailboard/Kiteboard	59,492	3.20%
Small Sailboat	45,462	2.50%
Other	9,577	0.50%
Total	1,822,693	100.00%

Table 9 Types of Nonmotorized Recreational Boats 2019

Source: California Department of Boats and Waterways

The nonmotorized boat study notes that kayaks have grown significantly in popularity. Almost 90% of kayaks are used five or more days per year. The study estimated the number of participants in nonmotorized boating at 2.7 million, a figure that reflects the single occupancy nature of most of these boats. When the number of boating days is counted rather than the number of boats, kayaks are the most often used of the nonmotorized boats, with an estimated 22.9 million boating days, almost twice as much use as the next most used (but more commonly owned) inflatable craft. Sail/Kiteboarders have the smallest number of days, but this is to be expected as these are boats that require both high levels of skills and specific weather conditions. Table 10 also shows that the vast majority of boats are used five or more days per year.

Boats Utilized 5+ Days	50,617,243	98.2%
Kayak	22,870,813	44.4%
Inflatable	14,623,673	28.3%
Canoe	5,414,085	10.5%
Rowing Boat	4,116,922	8.0%
Sailboard/Kiteboard	623,248	1.2%
Small Sailboat	2,099,345	4.1%
Other	869,157	1.7%
Boats Utilized 1-4 Days Per Year	937,429	1.8%
Total	51,554,672	100%

Table 10 Boating Days for Nonmotorized Boats

Source: National Survey of Recreational Boating

The geographic distribution of registered boats is shown in Table 10. The registration process requires the owner to designate whether the boat is a “pleasure” or recreational boat. % Ninety-eight percent of registered boats are designated as used for recreation, and this is consistent across all regions. Forty three percent of registered boats are registered to owners living in non-coastal counties; this is substantially more than the population share of these counties, which is 28.7%. This still leaves over 380,000 registered recreational boats in coastal counties.

	All Boats	Pleasure Boats
Central	22,826	22,258
Non-Coastal	291,570	287,686
Northern	11,412	11,040
San Francisco Bay	147,051	144,887
Southern	194,146	190,686
Total	667,005	656,557

Table 11 Registered Powered Boats by Region
Source: California Department of Motor Vehicles

Additional data on boating utilization is provided in the National Survey. Motorized boats are used on the water an average of 51 days per year and human powered boats an average of 35 days per year.⁸ This results in an estimated 19.6 million boating days in California in 2018, with 13.4 million for motorized boats and 4.6 million for nonmotorized boats. No breakdown of this data by coastal/inland is available. An estimated 3.3 people are aboard on motorized boat trips and 1.6 people on human powered boats⁹. The result is 58.3 million person-days, of which 46.4 million person days were in motorized boats and 7.3 million were in human powered boats.

As a rough estimate, the number of boating days based on the share of recreational boats in coastal counties (56%) would be 11.0 million boating days and 32.8 million boating days.

9. Sightseeing

The recreational studies for the Ocean Protection Council found that the most frequently reported coastal activity is “sightseeing” and California is certainly well suited to this type of recreation, with Highway 1 being perhaps the longest single highway adjacent to the ocean in the U.S. Of Highway 1’s 656 miles, 135 miles (21%) are designated as California scenic

⁸ Separate estimates are not available for sailboats.

⁹ Age 12 and older.

highways. The designated scenic highway sections include the Big Sur coast in San Luis Obispo and Monterey counties and the stretch from Santa Cruz to San Francisco. Parts of other highways, including U.S. 101 in Santa Barbara County and in Del Norte County along with parts of State Routes 35 in San Mateo County and 75 and 163 in San Diego. (Figure 4)

Figure 4 Designated California Scenic Highways



Source: Caltrans

A much larger share of California’s highways is deemed “eligible” for designation, meaning they have the qualities required for designation as scenic, but have not yet been through the full process of designation. (Figure 5). Virtually all of Highway 1 save for a portion in the most urban parts of Los Angeles is in this eligibility category, along with most of Route 101 in Del Norte County.¹⁰

¹⁰

Figure 5 Highways Eligible for Designation as Scenic



Source: Caltrans

There is no information about how many people recreate by driving along the scenic highways, as no survey of scenic highway users by trip purpose is available. Table 12 shows Annual Average Daily Traffic (AADT) and total Annual Traffic estimates for selected points along Highway 1 from Orange County to Mendocino County. This data is derived from traffic counters placed at the stated locations. The Mile Post denotes the miles from the county line for each counting point.

The average daily traffic at these points is nearly 350,000 vehicles, with a total of over 126 million vehicle observations across these various points. These are not necessarily unique vehicles as some vehicles may make more than one trip per day past the same point. The number of occupants per vehicle is not known, nor are trip purposes. Many of these trips are for commuting, shopping, business, etc. But each of the travelers on Highway 1 at these various

points has the opportunity to have a view of the ocean and shoreline which, whether the principal reason for the trip or an enhancement of the trip, has some value to the travelers however short the experience.

County	Mile Post	Location	Average AADT	Annual Traffic
Orange	0.129	Dana Point, Jct. Rte. 5	37,929	13,843,929
Los Angeles	47.091	Malibu, Cross Creek Road	43,000	15,695,000
San Luis Obispo	28.82	Morro Bay, South Morro Bay	21,550	7,865,750
Monterey	46.595	Big Sur River Bridge	4,171	1,522,571
Monterey	68.335	Carmel Highlands, Yankee Point Drive North	7,858	2,868,292
Monterey	79.357	Seaside, Jct. Rte. 218	68,871	25,138,071
Monterey	96.101	Moss Landing, Dolan Road	38,286	13,974,286
San Mateo	29.036	Half Moon Bay, Jct. Rte. 92 East	28,186	10,287,786
San Mateo	42.583	Pacifica, Reina Del Mar Avenue	52,483	19,156,417
Marin	0.65	Tamalpais Junction, Almonte Boulevard	18,100	6,606,500
Sonoma	5.38	Bodega Highway	7,243	2,643,643
Mendocino	60.68	Fort Bragg, Cypress Avenue	18,257	6,663,857
		Total	345,935	126,266,101

Table 12 Traffic Levels at Selected Points on Highway 1

Source: Caltrans

10. Scenic Water Tours

California’s scenic highways permit sightseeing by land but sightseeing by water is an increasingly important part of coastal recreation. This is a very diverse industry including whale and nature cruises, kayak tours, cocktail and dinner cruises, and the ferry to Alcatraz Island. In 2019 there were 216 firms in the “scenic water tours” industry, employing over 1,800 people. The largest number of firms was in southern California (Santa Barbara to San Diego counties), followed by the Bay Area

	Establishments	Employment
Bay Area	40	420
Central	25	89
Inland	9	N/A ¹¹
Northern	13	3
Southern	129	1,333
TOTAL	216	1,845

Table 13 Scenic Water Tour Companies in Coastal California

Source: Bureau of Labor Statistics

The scenic water tours industry is composed exclusively of private sector firms, and there are no publicly available statistics of the number of annual passengers. This is unfortunate as such tours are a major and growing way for many to experience the coast. Rough calculations of the number of people visiting the coast via boat tours can be made from available data on the vessels used and services provided. Table 13 shows the number of vessels documented by the Coast Guard and used for carrying passengers in California waters. The table excludes boats registered with the State of California, which would include a number of smaller vessels and those used on inland waters. The total shows 741 vessels with Coast Guard documentation and licenses to carry passengers. Most of these (90%) are in the class that are permitted up to 150 passengers. Los Angeles/Long Beach is the home port for 40% of the vessels, follows by San Francisco (34%).¹² The ratio of vessels documented to the number of firms in the industry indicates that many if not most of the firms operate more than one vessel.

Port	Vessels > 100 gross tons	Vessels < 100 gross tons with a capacity greater than 150 passengers	Vessels < 100 gross tons with a capacity of 6 to 149 passengers	Total
Los Angeles/Long Beach		17	289	306
San Diego	2	6	172	180
San Francisco	2	49	204	255
Total	4	72	665	741

Table 14 Scenic Water Tour Vessels by Size

Source: US Coast Guard

¹¹ Not available for confidentiality protections.

¹² A vessel's home port does not necessarily coincide with the vessels base of operations. Vessels home ported in San Francisco might operate from several different locations in and around San Francisco Bay.

Hornblower Cruises¹³ is one of the largest operators of scenic water tours in California. The company operates in the Bay Area, Los Angeles (Marina Del Rey), Newport, and San Diego. The company operates 25 vessels with an average capacity of 370 people. The vessels range in size from 50 passenger vessels in San Diego and Newport to 1,500 in San Francisco. Their schedule of cruises includes whale watching, harbor tours of varying lengths, dinner and other meal or cocktail cruises, and special event cruises. Their published schedules indicate that around 730 cruises are conducted each year, though the actual number may be smaller because of weather, demand, etc. This number also excludes the ferry service from San Francisco to Alcatraz, which runs half hourly services each day.

The total capacity of the 25 vessels in the Hornblower fleet is estimated at 9,600. If the 730 trips were completely full at all times, the Hornblower company alone would carry over 7 million passengers a year. Of course, the vessels are rarely filled to capacity, except perhaps the smaller ones. But if Hornblower cruises carried 1 million passengers a year (a very conservative capacity factor of only 15% on average) it would still be a major supplier of recreational services to coastal visitors and it is still only one company. Extrapolating from this analysis, a measurement of the number scenic water tours visitors would probably lie between 2.5 and 5 million per year. It is a population that is largely invisible.

11. Recreation and Conserved Waters

The coast of California not only has a substantial amount of land set aside for conservation and public purposes, substantial portions of the offshore waters are also designated conservation areas, either by the federal government in the form of four marine sanctuaries, or by the State of California in 124 marine protected areas of various types. Thirty-seven of the marine protected areas are co-located with national marine sanctuaries. (Figure 6). The national marine sanctuaries encompass an area of nearly 7,600 square miles, while the state marine protected areas together cover 852 square miles.

This substantial area of conserved waters coincides with a great deal of recreational activity in both terrestrial and marine spaces. There have been few studies examining the relationship between conserved waters and recreational activity. The surveys for the California Coastal Conservancy cited earlier did contain an analysis of recreational activity in the State Marine Protected Areas in the southern region as defined for that study (See Figure 1). Their estimates of the number of recreational trips within state-designated Marine Protected Areas together with the specific activities are shown in Table 15.

¹³ Named for the fictional hero of a series of novels by C.S. Forester of the Royal Navy in the Napoleonic Wars.

Activity	% of Trips	% Trips inside MPA's	Estimated N Trips (Millions)	Most popular MPA	County
All Recreation	100.0%	10.4%	12.6	Port Dume SMCA	Los Angeles
Beach	57.7%	8.4%	5.86	Port Dume SMCA	Los Angeles
Sightseeing	43.4%	10.0%	5.25	Port Dume SMCA	Los Angeles
Photography	18.9%	10.4%	2.38	Port Dume SMCA	Los Angeles
Bird/marine life watching from shore	14.9%	18.5%	3.33	Port Dume SMCA	Los Angeles
Sightseeing from car	14.0%	16.3%	2.76	Port Dume SMCA	Los Angeles
Swimming	12.1%	12.2%	1.78	Port Dume SMCA	Los Angeles
Biking/Hiking	11.5%	7.0%	0.97	Dana Point SMCA	Orange
Collection of nonliving resources	4.8%	27.1%	1.57	Port Dume SMCA	Los Angeles
Tide Pooling	4.2%	22.3%	1.13	Crystal Cove SMCA	Orange
Surfing	3.9%	8.9%	0.42	Matlahuayl SMR	San Diego

Table 15 Recreational Activity in Southern California MPAs

Source: Chen et al (2013 and 2015)

This table shows the estimated number of trips in which the respondent reported participating in the listed activity; a multiple answer question as a single trip may have involved more than one activity. The table covers trips to all MPA's, but also shows the most visited MPA for the listed activity. On average 10.4% of trips to the coast for these activities are reported to have taken place in or near a Marine Protected Area. Activities involving nature observing or collecting are the most likely to be in or near an MPA, which is consistent with the general purpose of conserved areas. The Port Dume State Marine Conservation Area in Malibu is the most visited MPA in part because there is an adjoining state park, and the park and conservation area are easily accessible to the Los Angeles population. Comparable information for the northern counties in the Coastal Conservancy survey was not available.

These surveys provide a useful overview of recreational activities in and around state MPA's, but there is a notable absence of information on boating in these areas. This is a possibly significant omission because of the popularity of sea kayaking in California, which offers a platform for low-impact interactions with the resources in MPA's.

For recreation in conserved areas outside Southern California, data is available for some recreational activity in the National Marine Sanctuaries which extend along the Central Coast. (V. R. Leeworthy, Jerome, and Schueler 2014; V. R. Leeworthy and Schueler 2014; V. Leeworthy, Schwarzmann, and Reyes Saade 2015) These sanctuaries, except for Cordell Banks, which is entirely offshore, allow recreational fishing from both shore and boats. Boats may be owned or rented or may be commercial charter or party trips. Table 15 shows the estimated 2019 number

of recreational fishing days within the national marine sanctuaries. These estimates are taken from average reported levels from 2010-2012 adjusted to 2019 levels based on population growth.

	Cordell Bank	Greater Farallon's	Monterey Bay	Channel Islands	Total
Co-located State MPA's	N/A	11	15	11	37
Shore Fishing	N/A	32,811	310,597	N/A	343,408
Private/Rental	563	35,582	120,006	17,111	173,262
Commercial Recreational Fishing Companies	462	24,290	34,379	41,661	100,792
Total	1,025	92,683	464,982	58,772	617,462

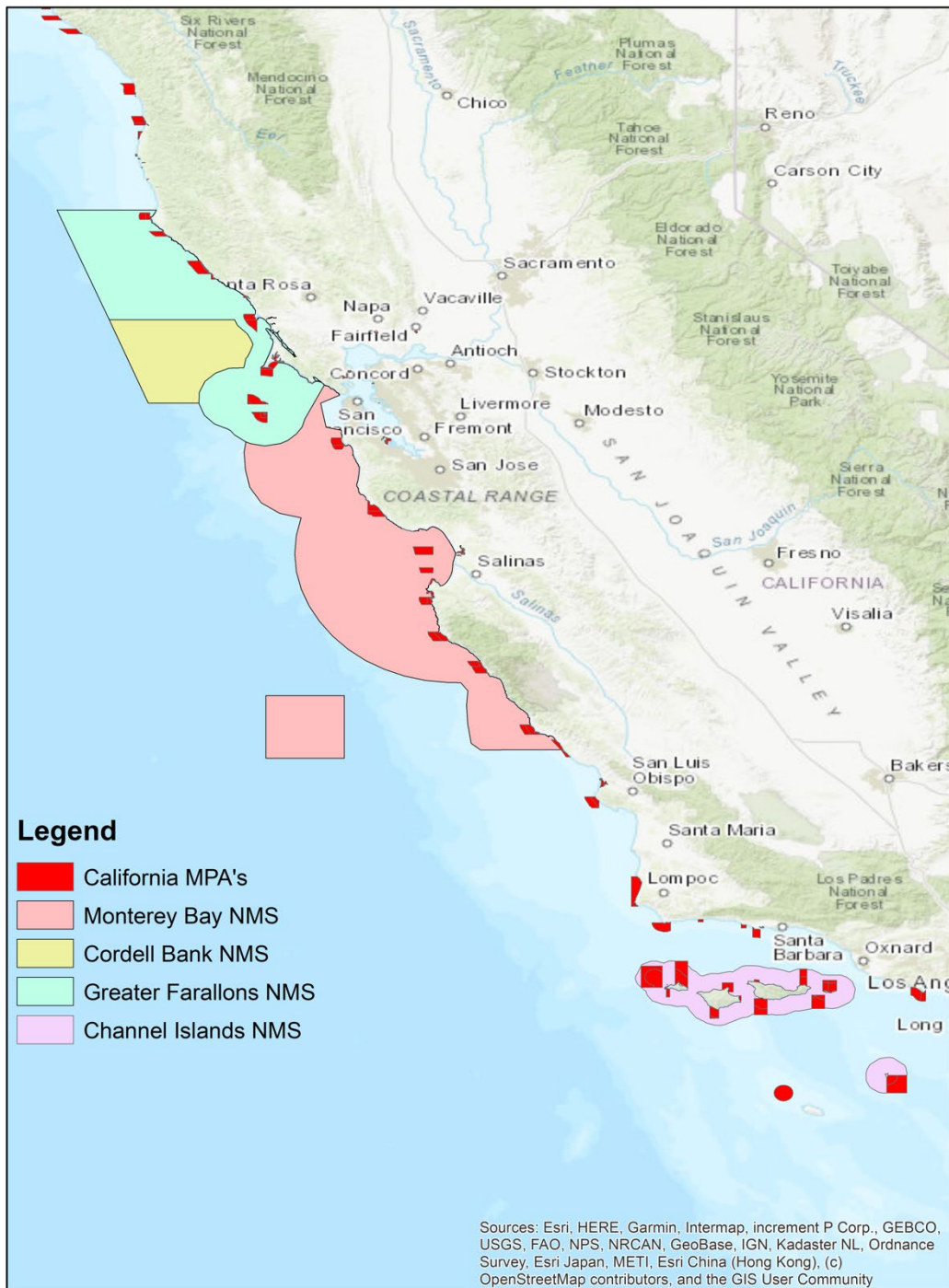
Table 16 Recreational Fishing Days in National Marine Sanctuaries

Source: (V. R. Leeworthy, Jerome, and Schueler 2014; V. R. Leeworthy and Schueler 2014; V. Leeworthy, Schwarzmann, and Reyes Saade 2015)

The four marine sanctuaries are estimated to have been the location of over 600,000 recreational fishing days, with 75% of the activity in the Monterey Bay Marine Sanctuary, which is also the largest of the four sanctuaries, stretching from the Golden Gate to Cambria in San Luis Obispo County. It should be noted that 37 California MPA's are co-located within the marine sanctuaries. (Figure 6), so some of the recreational fishing in the marine sanctuaries may be take place in marine protected areas if fishing is allowed in that area (regulations vary).

The studies of recreation in the marine sanctuaries and marine protected areas omit substantial amounts of activities. The specific questions about recreation in MPA's in the OPC survey did not address boating at all, and the marine sanctuary studies only addressed boating for fishing purposes. But the nearly 8,000 square miles of marine sanctuaries is certainly the location of a substantial amount of recreational boating in areas such as the Channel Islands, Monterey Bay, and the areas just offshore the Golden Gate. Kayaking and sport diving in the nearshore marine protected areas are also likely popular activities for which no data could be found. The available data on the relationship between marine conserved areas and recreation shows there is no inherent conflict between the two. Substantial recreational activities take place in conserved areas, although precise estimates of the number of users are lacking through the whole range of California's MPA's. There may, of course, be conflicts between recreational use and habitats or species in specific MPA's which would be a subject of concern for management and law enforcement agencies. But the available data suggests that conserved waters and lands do contribute to recreation in California's coasts.

Figure 6 California National Marine Sanctuaries and Marine Protected Areas



Source: California Geoportal, ESRI

12. Improving understanding of coastal recreation

The above sections draw together information from a variety of sources using a variety of methods to provide estimates of the enormous amount of recreational activity that takes place along the California coast. But these estimates also convey a false sense of precision. Even the most rigorous approaches to learning about resident recreation along the coast examined, the OPC surveys of 2013 and 2015, omit large portions of the coast such as Monterey County which are among the most well-known and heavily used. State parks attendance data, which is regularly published, is collected with substantial, but unknown, residual error. Monitoring of recreation in marine protected areas was designated as a priority when long term monitoring plans were formulated in the early part of the last decade, but no funds have been allocated after 2015 to carry out such monitoring. And entire categories of recreation, such as boating, are not monitored at all or are the subject to one-time studies that offer useful snapshots, or at a smaller scale, with limited detail.

There are a number of ways that improved estimates of recreation and visitation to the California coast can be made. Many of these are not necessarily expensive but do require an investment to establish and require continuing resources (and organizational commitments) to update. Some suggestions for this are offered below. But first it is important to ask the question: Why do we need to know about recreation on the California coast? There are three main reasons:

- Recreation is one among many competing uses of the very limited amount of coastal land and water. Consistent, reliable, and valid estimates of recreation allow awareness of the importance of recreation to have a factual basis and not the result of claims of one form or another from parties with different interests.
- Many of the key decisions about coastal resources involve some tradeoffs between different (and often competing) uses of the coast. While the first reason speaks to the overall magnitude of recreation, this speaks to the need for recreation uses to be factored in as changes in coastal uses are considered by both public and private organizations. It is not possible to judge changes unless there is a starting point from which to measure change.
- Change is also the third reason why much more information is needed about recreation, for climate change and sea level rise are destined to alter the California coast in profound ways in the coming decades. The current climate crisis in California which is most visible as drought and wildfire, even with aggressive and successful efforts to reduce greenhouse gas emissions (neither of which are assured), substantial alterations in the coastal and marine environments lie ahead.

Many beaches, tide pools, shoreline trails, and other assets currently enjoyed by recreational users will be overwhelmed by sea level rise within the next twenty years. Recreational uses will be impacted. The fleet of 660,000 motorized boats that currently relies entirely on gasoline and diesel for propulsion, will need to change in ways that are not yet known.

In addition to the questions of how many recreate on the coast and what they do there is also the question of *who* recreates at the coast. If little is known about the first two dimensions, even less is known about the third. The California Coastal Act was written to ensure access for all, and it is clear from a number of studies (e.g., Christensen and King 2017) that many low-income households and communities of color do not visit the coast as frequently as their counterparts in California.

This is especially critical given how little is understood about coastal recreation behaviors of residents of the inland counties in California. These areas more diverse and lower income than the coastal counties, containing many underserved populations for whom a visit to the coast is a luxury. The coastal zone, the region nearest the coast with the best access to all forms of recreation, is overwhelmingly white and wealthy (Reineman, Wedding, Hartge, McEnery, & Reiblich, 2016).

There has been some research on the income and ethnicity of beach users in southern California, but the available data suggests there is a very large population of coastal recreationists who sightsee, walk, photograph, or simply explore natural areas like tidepools and these activities require no special skills and can be enjoyed by people at all ages and income levels. In short, the time when California can continue to live largely in ignorance of how its coast is used has come to an end. Many people would describe the data assembled here as “better than no data”, but that is not a basis on which one should want to bet the future of the coast. The following suggestions are generally applicable. Detailed application of the suggestions will have to be worked out for each region and recreation type, and these lie beyond the remit of this project.

There are four areas of focus for improving data on recreational uses of the California coast. There are: the quality of the data, characteristics of the activity, information about the populations of users, methods of data collection, and systems for data management.

Data Quality.

Temporal and spatial consistency. Many studies of coastal recreation are essentially one-time only studies done for a specific purpose at a specific time. Such studies can be an important contribution to knowledge about coastal recreation, but they leave large gaps. Whether one-time or continuously collected data should be designed for consistency over time and space. Data collected in northern California this year should be consistent with data

collected in southern California in 5 years, whether the data is persons, person days, trips, or any other measure.

Validity. Data should measure what it purports to measure. For example, measure of attendance at a state park might be made by inferring the number of people from the number of vehicles in the parking lot at midday. Without a demonstrated link showing the ratio of vehicles to users, this approach actually just measures vehicles, not population. Indirect measures, such as parking, can be important, but they must be demonstrably valid.

Characteristics of the Activity

Active v. passive. Much coastal recreation is active. Swimming, surfing, sailing, bicycling are all examples. But more recreation is “passive” including various versions of sightseeing, photography, etc. The OPC surveys indicate that these are the most popular type of coastal recreation because it is low cost and accessible to anyone without the need for special equipment or skills.

Location. Much of coastal recreation takes place in, on, or under the water, which increases the difficulty of measurement simply because of difficulties in observation. Activities such as boating have to be assessed when people are ashore, not actively under way. Activities on land can be equally difficult to measure because there are too many access points where people can enter and exit the recreational space. There are methods for dealing with these locational issues, but the choice of methods can dramatically affect consistency and validity of the data.

Another feature of location is *size*. The largest recreational areas will always yield the largest use numbers, but the cumulative size of the smallest areas may be quite significant. An example is people who enjoy exploring tide pools, which may be only a few square meters in size and invisible half of every day but still comprise a significant portion of recreation in marine protected areas, which are themselves often quite small in comparison with other public facilities.

Frequency. A major challenge with coastal recreation is that it can be highly variable from season to season, day to day, and even hour to hour. What starts as a foggy day in Monterey or Ventura in July may turn into a perfect beach day by the afternoon. Conditions for surf watching, a popular activity in many places, may depend on storms in the Gulf of Alaska a thousand miles distant. Studies of coastal recreation need to account for this variability or risk estimating significantly over or under actual visitation.

Characteristics of the population

Demographic Most of the data collected in this report speaks to how many, or when, or where people use the coast for recreation. Save for the reports on subsistence fishing and

resident/nonresident status in the surveys, none of the data speaks to “who” is recreating. Demographic data on age, gender, ethnicity and language, and income are critical to meeting California’s equity goals with respect to use of coastal resources. More importantly, the lack of such data will make it impossible to assess the equity impacts of climate change and of decisions about how to adapt to climate change.

Economic Values. This report has not examined the economic values associated with coastal recreation, but those values are clearly important. Coastal recreation is a major part of the California economy, contributing \$26.5 billion in gross domestic product, and employing over 440,000 people.¹⁴ And this is only a partial measure of the economic value. These figures reflect what people pay for coastal recreation, not what the experience is worth to them. Based on the OPC surveys, many people may pay little or nothing (beyond transportation) for their recreation experience. This surplus value is only partly measured and then only for some activities like surfing or beach going. The lack of this information makes it very difficult to assess the returns from public investments in coastal recreation or the losses that are at risk from climate change.

There are numerous studies of the economic value of recreation on the California Coast. Some, such as a study for the Huntington Beach tourism development agency, estimate economic impacts, or the total spending by visitors, jobs supported in the community, and indirect (multiplier) effects. (Strategic Consulting 2019). Others have studied the economic value of beach recreation or the value of wildlife viewing opportunities (Colgan 2020). These studies measure economic values at various times and places and use very different methods which produce estimates that are very hard to combine into single estimates, or even range of estimates. But understanding economic values is a key to understanding the role of coastal recreation in California’s economy and its importance to California residents. (Pendleton & Kidlow, 2006).

Data collection processes

Surveys and Administrative Data. Recreational user data ultimately derives from just two sources: surveys in which people are asked for relevant information, and administrative data required for the operation of government programs. The Coastal Conservancy survey of coastal recreational users is an example of the former, boat registration data is an example of the latter. State Parks lifeguard count data and camping data, is another example. The best data for measuring coastal recreation will come from use of both methods separately and in combination. Fishing license or boat registrations could include short questions.

For example, a renewal form might ask a question to indicate how many days the boat was used in the previous year. For more information, renewal forms could ask for an email

¹⁴ www.oceaneconomics.org

address and those who provide an email address and indicate a willingness to respond to an online survey would be contacted and presented a survey that could ask about economic values, locations of boating trips (this can be done with online mapping), and also collect information on demographic characteristics. This approach could also be used for fishing licenses.

Sampling. It is neither possible nor necessary to count everyone at every location all the time. However, one must have some knowledge of the distribution of visitors, particularly over time, in order to provide accurate estimates. That is the essence of sampling, which should be the standard approach to recreational use measurement. Sampling can greatly reduce costs of acquiring data, but it still requires some careful consideration. In particular choices must be made about the “right” size of the sample, which is simply the difference between the sampled result and the true result that is considerable acceptable.¹⁵ For example, a sample of boat registration renewal forms or fishing licenses could be examined and the answers recorded; a minimum of 400 forms per region (however defined)

Many lifeguard counts in southern California involve sampling at noon or sometime midday. However, without knowing the relationship between how many people are on the beach (or parked) and the total number of people expected to go that day, any lifeguard counts will be inaccurate. King and McGregor (2012) found that many of these lifeguard counts were seriously inaccurate; anecdotally, many lifeguards told the authors that they did not consider counting visitors to be their primary occupation and they had never been properly trained to count.

The U.S. Census provides a very good model for constructing a sampling strategy. Surveys are sent every year to different portions of the population, with short surveys sent to a large number of people, and longer surveys sent to a population over three- and five-year intervals. This approach allowed the Census to eliminate what had been called the “long form” in the decennial census and produce more data more frequently. A similar approach could be designed to cover state parks, boating, fishing, marine protected areas, and highway users. A coordinated strategy across state agencies would provide the most information at the least cost, similar to the National Outdoor Recreation Survey sponsored by multiple federal agencies.

Technologies. A number of technologies can be used for both direct and indirect measurements of recreational activities. The development of large-scale panels, or groups of people who agree to respond to email-invited surveys, permits access to populations large enough to ask very detailed questions with relatively small sampling errors. The OPC surveys used in this report were panel surveys. A number of commercial firms maintain large panels that can be accessed at relatively modest cost for almost any demographically or geographically defined population. Indirect measurements such as mobile phone data can be used to track road traffic or activities on beaches or associated parking lots; in combination with sampled

¹⁵ The term for this is standard error of the sample. A survey with a standard error of 3%, which is quite common, would have a value, say average age, that was within $\pm 3\%$ of the actual population average age.

survey data, these could produce high quality data on use. The proliferation of low cost geospatially accurate photographic data with unmanned aircraft systems (drones) in combination with photo interpretation software, could produce highly accurate utilization data in both large and small areas.

Data Management

All of the foregoing with respect to data could be for naught without a well-prepared and executed data management plan. That plan needs to include elements related to:

Data Collection which would include many of the elements discussed above but also cover issues surrounding data formats, storage locations, access permissions etc.

QA/QC. All data is subject to errors in entry, aggregation, and other processing. Quality Assurance and Quality Control procedures make sure that such errors are found as early as possible and appropriate adjustments made.

Curation. Curating data refers to storage, archiving, development of metadata, and developing information about the data for users.

Publishing Finally data must be made available in appropriate formats with appropriate summarization (including protection for confidentiality where needed), be easily accessible to the public and suitable uses in many different types of analysis. This would include standard formats such as .xlsx or .csv as well as specialized formats for software such as R, SAS, or SPSS. Data should also be published in GIS formats (.shp or kml files) when appropriate.

13. Conclusions

The California coast extends across 1,200 miles (3,000 miles depending on what is counted). There have been extensive investments in understanding the physical and biological dimensions of the coast. There are numerous world-class ocean science institutions in California furthering understanding of those dimensions. However, there has been little effort to understand one of the key components of the marine ecosystem: human use. This report compiles what is available on recreational uses of the coast. It omits a large population of beach users that use locally (county or city) owned beaches. The available evidence shows that:

- Over 50% of the California population likely visits the coast for recreation ever year.
- By far the most important form of recreation on the California coast is simply experiencing the coast whether from locations on land or in a boat

- The most popular uses of the coast are nonconsumptive uses, including not only beach going, but also a variety of active recreation such as swimming or boating, and passive uses such as scenic drives and photography.
- Southern California accounts for most coastal recreation if beaches are included, but Central and Northern California account for most non-beach uses and nonconsumptive uses.
- While State Beaches are quite popular, State Parks, which contain many different shoreline types in addition to beaches are more popular.
- Boats are well measured, but boating activity is not. This is true both for self-owned boats and for hired boats, whether rentals and charters, dinner cruises in the harbor, or nature viewing boat trips.
- The highways with coastal views are a very important asset whether the sightseeing is a principal or an incidental purpose of a trip.
- Methods to expand data collection and improve precision of estimates are available that can greatly improve understanding of recreational uses, and which can be implemented at modest cost. Implementing these approaches and expanding the knowledge base of how many people use the coast for recreation, who the people are, and what they do for recreation is essential to the sustainable use of California's coast.

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Appendix A. Detailed Data Tables

State Parks Properties Included in the Analysis.

Row Labels	Sum of Avg. Annual Attendance
Beach	3,331,274
Central Coast	2,889,590
Asilomar SB	1,019,050
Carmel River SB	940,673
Marina SB	375,777
Moss Landing SB	124,858
Salinas River SB	261,857
Zmudowski SB	167,375
Northern	377,507
Greenwood SB	225,272
Little River SB	49,610
Trinidad SB	102,625
Southern	64,177
McGrath SB	64,177
Forest	60,152
Northern	60,152
Big Lagoon S. Forest	60,152
Historic Monument	404,234
Central Coast	404,234
Hearst San Simeon SHM	404,234
Historic Park	421,294
Bay Area	167,632
Pigeon Point Light Station SHP	167,632
Central Coast	206,367
Monterey SHP	206,367
Northern	47,295
Fort Humboldt SHP	47,295
Natural Reserve	692,504
Bay Area	32,539
Kruse Rhododendron SNR	32,539
Central Coast	524,613
John Little SNR	178,644
Point Lobos SNR	345,969
Northern	135,352
Caspar Headlands SNR	135,352
Recreation Area	184,202

Bay Area	158,920
Candlestick Point SRA	158,920
Northern	25,282
Harry A. Merlo SRA	25,282
Parks	24,445,301
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Bay Area	8,762,505
Angel Island	231,967
Ano Nuevo	148,739
Bean Hollow	226,195
China Camp	277,180
Fort Ross	74,038
Half Moon Bay	507,857
Pescadero	556,192
Salt Point	33,716
Sonoma Coast	3,365,029
Tomales Bay	3,341,592
Central Coast	6,589,818
Estero Bluffs	22,349
Fort Ord Dunes	269,178
Garrapata	334,819
Harmony Headlands	6,490
Hearst San Simeon SP	563,852
Julia Pfeiffer Burns	136,614
Limekiln	25,130
Montana De Oro SP	1,110,429
Morro Bay	829,619
Morro Dunes (NP)	1,624,273
Natural Bridges SP	696,801
New Brighton	601,420
Point Sur	60,395
Wilder Dairy CP/Wilder Ranch	308,449
Northern	3,995,325
Del Norte Redwoods	15,674
Humboldt Lagoons	229,118
Jug Handle	470,094
MacKerricher	393,747
Manchester	30,425
Mendocino Headlands	950,206
Patrick's Point	95,828
Point Cabrillo Light Station	126,172

Prairie Redwoods Creek	204,506
Russian Gulch	248,588
Schooner Gulch	44,467
Sinkyone Wilderness	70,656
Tolowa Dunes	20,422
Van Damme	1,010,114
Westport-Union Landing	85,308
Southern	5,097,653
Border Field SP	805,127
Crystal Cove	951,652
Gaviota	49,893
Leo Carillo	467,196
Point Dume	231,496
Point Mugu	314,266
Point Sal	556,975
San Onofre Bluffs	1,721,048
Marine Parks	237,955
Central Coast	237,955
Cambria SMP	237,955
Grand Total	29,776,916

License Types

License Type	Description
<i>Annual Sport Fishing</i>	A sport fishing license is required for any person attempting to take fish, mollusks, crustaceans, invertebrates, amphibians, or reptiles in inland or ocean waters. Additional validations and report cards are required for certain species and areas.
<i>Resident Sport Fishing</i>	Available for any resident 16 years of age or older.
<i>Nonresident Sport Fishing</i>	Available for any non-resident 16 years of age or older.
<i>Reduced-Fee Sport Fishing License- Disabled Veteran</i>	Available for any resident or nonresident honorably discharged disabled veteran with a 50 percent or greater service-connected disability. After you prequalify for your first Disabled Veteran Reduced Fee Sport Fishing License, you can purchase disabled veteran licenses anywhere licenses are sold.
<i>Reduced-Fee Sport Fishing License- Recovering Service Member</i>	Available for any recovering service member of the US military. After you prequalify for your Recovering Service Member Reduced-Fee Sport Fishing License, you can purchase recovering service member licenses anywhere licenses are sold.
<i>Reduced-Fee Sport Fishing License- Low Income Senior</i>	Available for low-income California residents, 65 years of age and older, who meet the specified annual income requirements. The Reduced-Fee Sport Fishing License for Low Income Seniors is only available at CDFW License Sales Offices.
<i>Free Sport Fishing License- Low Income Native American</i>	Available for any Native American who is a resident of the State and is financially unable to pay the fee required for a resident sport fishing license. The Free Sport Fishing License for Low Income Native Americans is only available at CDFW License Sales Offices.
<i>Free Sport Fishing License- Mobility Impaired, Blind, or Developmentally Disabled</i>	Available for a person who is blind, developmentally disabled, or mobility impaired. Your first Free Sport Fishing License must be obtained from the CDFW License and Revenue Branch. Subsequent licenses may be obtained from any license agent. See application for details.
<i>Short Term</i>	
<i>One-Day Sport Fishing</i>	Allows a resident or nonresident to fish for one specified day. One-day sport fishing licenses are exempt from the Ocean Enhancement Validation requirement.
<i>Two-day Sport Fishing License</i>	Allows a resident or nonresident to fish for two consecutive days. Two-day sport fishing licenses are exempt from the Ocean Enhancement Validation requirement.
<i>Ten-day Nonresident Sport Fishing License</i>	Allows a nonresident to fish for ten consecutive days.

<i>Validations and Report Cards</i>	Report cards are required for any person fishing for steelhead, sturgeon, abalone, spiny lobster, or salmon (salmon in the Klamath, Trinity and Smith Rivers only). Every person fishing for these species must have an appropriate report card, including any person who is not required to have a sport fishing license, such as a child who is under 16 years of age, a person who is fishing from a public pier, and any person who is fishing on a free fishing day.
<i>Ocean Enhancement Validation</i>	Required to fish in ocean waters south of Point Arguello (Santa Barbara County). An Ocean Enhancement Validation is not required when fishing under the authority of a One or Two-Day Sport Fishing License.
<i>Second Reel Validation</i>	Allows a person to fish with two rods or lines in inland waters, except for waters in which only artificial lures or barbless hooks may be used.
<i>Abalone Report Card</i>	Fishery is currently closed - Required for any person taking abalone from ocean waters north of the center of the mouth of San Francisco Bay. Only one Abalone Report Card may be issued per person each license year.
<i>Sturgeon Fishing Report Card</i>	Required for any persons taking sturgeon. Only one Sturgeon Fishing Report Card may be issued per person each year.
<i>Norht Coast Salmon Report Card</i>	Required for any person taking salmon in the Smith River System or Klamath-Trinity River System.
<i>Steelhead Report Card</i>	Required for any person taking steelhead in inland waters.
<i>Spiny Lobster Report Card</i>	Required for all persons taking spiny lobster. Report card holders who fail to return their Spiny Lobster Report Card or report their harvest online by April 30, will be assessed a \$21.60 non-return fee when they purchase a spiny lobster report card for the following season.
<i>Lifetime</i>	Available to residents of California. Lifetime fishing licensees receive an annual sport fishing license each year for life. Lifetime Fishing Packages must first be purchased from a CDFW License Sales Office. See Lifetime License Information for more detail.
<i>Fishing Privilege Package</i>	Includes a Lifetime Second-Rod Stamp, Ocean Enhancement Stamp, North Coast Salmon Report Card and Steelhead Report Card.

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