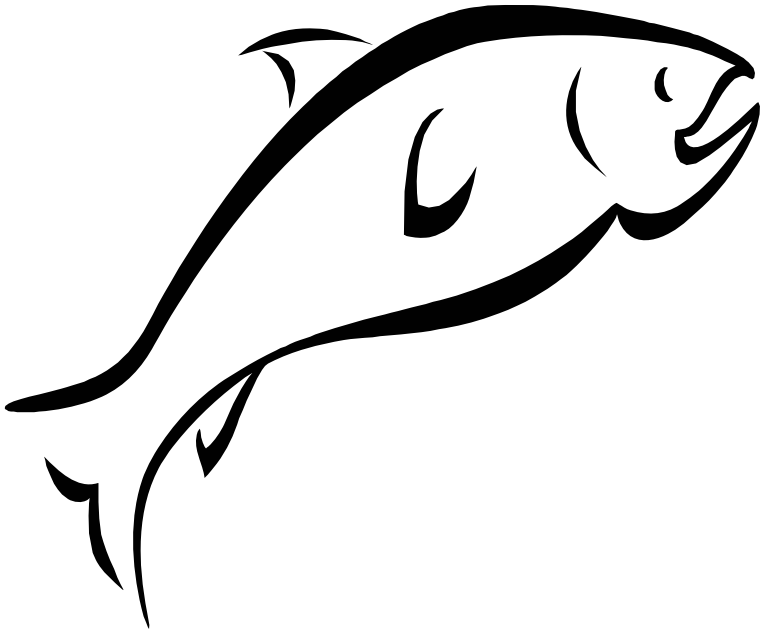
Fisheries Report
Department of Fish and Game
Marine Region



36th ANNUAL FISHERIES FORUM
MARCH 2009

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State Managed Fisheries

California Halibut

California halibut, *Paralichthys californicus,* is an important nearshore flatfish species to both commercial and recreational fisheries in central and southern California. Individual fish can grow to five feet in total length and weigh as much as 72 pounds. Current commercial regulations require a minimum size limit of 22 inches total length for retention. From 1999 to 2008, total annual commercial landings ranged from a high of 1.31 million pounds in 1999 to a low of 389,300 pounds in 2007 and averaged 834,300 pounds. During this same period, annual ex-vessel value ranged from a high of $3.28 million in 1999 to a low of $1.84 million in 2007. Preliminary results for 2008 show commercial landings totaling approximately 465,100 pounds with an ex-vessel value of $2.25 million. These landings are well below the recent 10-year average, but higher than those of 2007. The top three port complexes, by pounds landed for all gear types combined, were San Francisco (44 percent), Santa Barbara (35 percent) and Los Angeles (12 percent).

California halibut are harvested using three primary commercial gears: trawl, hook-and-line, and set gill net; together these comprised 99 percent of 2008 halibut landings. Trawl was the dominant commercial gear used to harvest halibut in 2008, accounting for over 43 percent of the total catch. Hook-and-line was the second most dominant commercial gear used in 2008, accounting for 33 percent of the total catch. Set gill net was the third most dominate commercial gear used in 2008, accounting for 23 percent of the total catch.

The California Halibut Trawl Grounds (CHTG) were established in 1971 and encompassed 201 square nautical miles of State waters not less than one nautical mile from the mainland shore between Point Arguello (Santa Barbara County) and Point Mugu (Ventura County). In 2005, several areas within the CHTG were closed to trawling, and in April 2008 the Fish and Game Commission (Commission) reviewed an additional four areas within the CHTG for possible closure. The Commission chose to close one of these areas, from Point Conception to Gaviota, effective August 2008. The three areas under consideration that remained open are Rocky Point to Point Conception, Santa Barbara Point to Pitas Point, and Hueneme Canyon to Laguna Point. These areas met the performance criteria listed in Fish and Game Code Section 8495,

which required that the use of trawl gear: 1) minimizes bycatch; 2) will not damage seafloor habitat; 3) will not adversely affect ecosystem health; and 4) will not impede reasonable restoration of kelp, coral, or other biogenic habitats. The CHTG now comprise approximately 150 square nautical miles. The open fishing season for the CHTG is June 16 to March 14, and there are specific trawl gear regulations that pertain only to the CHTG.

From 1999 to 2008, annual recreational California halibut landings ranged from a high of 1.84 million pounds in 2003 to a low of 291,000 pounds in 2007, and averaged 1.01 million pounds annually. The recreational fishery average annual landings during this period exceeded those of the commercial fishery (0.83 million pounds) by 18 percent. Preliminary data for the 2008 recreational fishery showed approximately 491,600 pounds of California halibut landed. This is a significant increase over the 2007 harvest, but well below the recent 10-year average. Recreational anglers primarily target halibut from shore, private skiffs, and party boats (also known as Commercial Passenger Fishing Vessels or CPFVs) using hook-and-line gear. Similar to the commercial fishery, recreational fishing regulations require a minimum size limit of 22 inches total length for retention. Recreational anglers are limited per day to five California halibut per angler south of Point Sur (Monterey County) and three California halibut per angler north of Point Sur.

In 2008, the California's Department of Fish and Game's (Department) Marine Region State Finfish Management Project sampled a total of 1,280 California halibut (1,178 from the commercial fishery and 102 from the recreational fishery) in San Francisco/Half Moon Bay, Monterey, Santa Barbara, and Los Angeles port areas. California halibut are also sampled routinely in the recreational fishery by the California Recreational Fisheries Survey (CRFS).

In February 2008, the SFMP began a series of fishery-independent trawl surveys within the CHTG. The goals of the surveys are to provide information on the relative abundance and size frequency of legal- and sublegal-sized California halibut, as well as gather information on associated soft-bottom species, in a well-established trawling area

The Department has entered into a contract to conduct a statewide stock assessment of California halibut. Work began in January 2009, and SFMP staff began the process of compiling relevant documents, data sources, and data sets.

For more information on the California halibut, go to the Department's Marine Region website: www.dfg.ca.gov/marine

Pacific Hagfish

The Pacific hagfish (*Eptatretus stoutii*) is a member of the Myxinidae (hagfishes) family. Members of this family have mucous-producing "slime" glands along

each side of the fish's body. When agitated, the hagfish will produce a protein-based mucous that, when mixed with water, produces a thick, viscous slime. This behavior is the reason hagfish are commonly called "slime eel".

Pacific hagfish are now the target of a robust, statewide re-emerging fishery. However, prior to 1982, hagfish were not landed or targeted by California fishermen and were considered only a nuisance due to their tendency to eat bait or destroy catches such as netted sharks and hooked deep-water rockfish. Hagfish can burrow into a trapped or long-lined hooked fish, eat the internal organs and, if timed allows, the rest of the fish.

In 1982 in Korean waters, a fishery for two related hagfish species was receiving heavy fishing pressure; the hagfish were being pursued for food and an "eel skin" leather trade. In the mid 1980's, due to fishery depletion, Korean hagfish processors began to look for outside sources of hagfish. By late 1987, Korean processors began to solicit California fishermen, mostly from the San Francisco and Monterey port areas, to target hagfish. After one year of fishing, eight vessels had landed 690,000 pounds. The hagfish were frozen and shipped to Korea for processing.

Shortly thereafter, interest in hagfish increased and California fishing activity surged. In 1989, statewide landings reached 2.6 million pounds from 80 participating vessels. The ports with the greatest activity were Ventura, Santa Barbara, Oxnard, and San Francisco. Landings reached the highest on record in 1990 with 5.0 million pounds from 56 participating vessels. Ironically, during this time, Korean interest in hagfish from California declined along with ex-vessel price. During the 1990 fishing season, skins of hagfish from California became less desirable due to holes from bites from other hagfish and unexplained pinholes commonly occurring in the dorsal part of the skin. During the curing process, these holes and bite marks would stretch and make the "leather" piece unusable. Hagfish demand decreased in 1991, and total catch fell to 300,000 pounds. Between 1992 and 2004, annual landings ranged from zero to 404,000 pounds and averaged 68,000 pounds.

Fishing effort and landings increased again in 2005 due to a renewed interest in Pacific hagfish from California. The species was sought primarily for human consumption in Asia, mostly in Korea. Most hagfish were caught and sold live to local fish receivers, and this practice continues today.

California landings in 2005 and 2006 were minimal, but sharply increased in 2007 to 1.7 million pounds. Ex-vessel price per pound ranged from $0.25 to $2.00 and averaged $0.78 per pound. In 2008, landings reached 1.8 million pounds with an ex-vessel price ranging from $0.01 to $1.75 per pound and averaged $0.95 per pound. Primary ports of landing at present are Eureka, Santa Barbara, Oceanside, Avila, Morro Bay, Dana Point, San Pedro, and San Diego.

Little is known about the status or biomass of Pacific hagfish stocks. Based on landings from the first surge of fishing activity from 1989 to 1991 and the current pulse, which began in 2007, the biomass must be large.

Pacific Herring

California's Pacific herring sac-roe fisheries are limited to the four largest spawning locations: San Francisco Bay, Tomales Bay, Humboldt Bay, and Crescent City Harbor. San Francisco Bay has the largest herring spawning stock south of British Columbia and historically produces more than 90 percent of California's herring catch. The long-term average spawning biomass for the San Francisco Bay spawning population is approximately 46 million pounds. Annual catch quotas are based on spawning biomass estimates, age structure analysis, and up-to-date oceanographic information.

San Francisco Bay herring sac-roe landings for the 2007-08 season totaled 1,374,000 pounds (65 percent of the quota was caught), valued at an estimated $612,000. This is an increase in landings from the 2006-07 season when 584,000 pounds were landed. The base price for herring in 2007-08 was $600 per ton up from $400 per ton but well below the historical average of $864 per ton since 1985-86. The increase in landings was attributed to the herring being larger-at-age when compared to recent seasons, likely making them more available to commercial gill nets.

Another facet of California's herring industry is the herring-eggs-on-kelp fishery. Giant kelp is harvested from the Santa Barbara and Monterey Bay coastlines then trucked to San Francisco Bay, and suspended from floating rafts or lines hung beneath piers. Rafts are anchored in locations where herring spawning is expected to occur. Once spawning has commenced, suspended kelp is left in the water until egg coverage is sufficient, after which the kelp with herring eggs attached is harvested. Landings from the 2007-08 San Francisco eggs-on-kelp fishery were approximately 30,000 pounds, with a preliminary value of $256,700.

On November 7, 2007, the container ship, *Cosco Busan* spilled an estimated 58,000 gallons of bunker fuel (IFO 380) into San Francisco Bay causing a temporary closure of recreational and commercial fisheries within the spill area. To determine the health risks of consuming bay area marine life, Department staff collected samples of crab, mussels, herring, and surfperch from a variety of locations and depths both in and outside the spill zone for laboratory testing. Analysis showed that fish and shellfish (with the exception of mussels found in two bay locations) from the spill area were safe for human consumption. Once results were released, all San Francisco Bay area fisheries were reopened on November 29, 2007. A natural resources damage assessment study is currently being conducted inside San Francisco Bay to determine if any remaining contaminants from the spill are negatively impacting herring eggs and larvae. Results from this study will be released once analysis has been completed.

For the 2008-09 season, the Commission adopted the Department's recommendation for a 1,118 ton San Francisco Bay quota, which represents 10 percent of the 2007-08 spawning biomass estimate. This conservative recommendation was based on concerns about the San Francisco Bay herring population returning to the bay in historically low numbers during the 2006-07 and 2007-08 seasons. Department data, collected on the San Francisco Bay herring population over the last 30 years, has indicated a substantial decline of the older age classes within the population. Additionally, declining size-at-age has been documented in the San Francisco Bay population, a trend that is also being reported in other west coast herring fisheries.

For more information, go to the Department's Marine Region website: www.dfg.ca.gov/marine/herring/index.htm

California Spiny Lobster

The commercial fishery for California spiny lobster, *Panulirus interruptus*, in southern California began in the late 1800s. Fishermen use baited traps that are individually buoyed and deployed along the mainland coast from Point Conception to the U.S. - Mexico border and at all the offshore islands. There is also a large recreational fishery, involving skin and scuba divers, and fishermen using hoop nets.

The 2007-08 commercial lobster season landings totaled 675,000 pounds, with an ex-vessel value of $7.2 million. Landings were almost split evenly between ports in San Diego County (31 percent), Los Angeles/Orange counties (34 percent), and Santa Barbara/ Ventura counties (35 percent). Landings in previous seasons have generally been highest in San Diego, followed by Santa Barbara/Ventura, and then Los Angeles/Orange counties. The 2007-08 catch and value declined from the previous season, when commercial landings totaled 879,000 pounds with an ex-vessel value of just over $8 million. The preliminary landing total for the 2008-09 commercial season is 627,000 pounds. The ten year average catch for the commercial fishery is 710,000 lbs. Lobster is a high value product, with fishermen usually receiving over $10 a pound. For the 2007-08 lobster season, the median price paid per pound was $11.

The commercial lobster season opens the first Wednesday in October and closes the first Wednesday after the 15th of March, while the recreational season opens the weekend before the commercial opener. Fluctuations in lobster landings are not unexpected, as the fishery is strongly influenced by climatic and El Niño and La Niña events. The lobster catch is primarily exported to Asian markets, with prices dependent on market demand. In recent years, fishermen have been trying to develop local markets. Results have been limited because of the widespread availability of American lobsters (*Homarus americanus*) and imported spiny lobster tails at a much lower cost.

In 1955, a minimum carapace size limit of 3.25 inches was established for both sport and commercial fishermen. Since the 1976-77 season, commercial fishermen have been required to use rectangular escape ports on their traps to decrease the retention of undersized lobster. This management tool, along with warming ocean conditions, apparently helped reverse a lengthy downward trend in landings. The total number of commercial traps pulled, an index of fishing effort, during the 2007-08 season was about 806,000. This is about 5 percent less than the 844,000 traps pulled during the 2006-07 season. The number of traps pulled has generally increased since the 1981-82 season when about 500,000 traps were pulled. Although there are currently no trap limits or catch quotas for the spiny lobster fishery, a restricted access program for the commercial take of spiny lobster was initiated in the 1996-97 season. There are currently 206 lobster operating permits.

In addition to a season and size limit, the recreational fishery is managed by a daily bag and possession limit of seven lobsters. Not more than five baited hoop nets per fisherman may be used from shore and divers are limited to using their hands only. Not more than 10 hoop nets per vessel are allowed to be used, regardless of the number of fishermen aboard.

Beginning with the 2008/09 sport lobster season, lobster report cards are required to be purchased so that fishers can record their catches and effort by date, location and gear type. This will provide the Department with the first reliable catch information since the sport fishery began decades ago. This information is essential for a comprehensive estimate of the total sport and commercial spiny lobster harvest.

Results from the 2007 creel survey provided the Department with its first look at the recreational lobster fishery since a creel survey was conducted in1992 in San Diego and Ventura Counties. In 2007, most effort and catch occurred in the southern-most counties with hoop nets dominating the gear of choice. In 1992, the gear of choice was scuba. Based on a comparison of the four sites common to both the 2007 and 1992 surveys, 80 percent of fishermen used hoop nets in 2007, a trend opposite the 1992 survey which documented that 80 percent of fishermen used scuba to pursue lobster. Data from the lobster report card will be used to determine if this reversal of dominant gear type extends beyond these four sites to southern California in general.

The Department has been working on collaborative research projects involving lobster populations in the northern Channel Islands with students of Dr. Lenihan at UCSB, Dr. Hovel at SDSU, and Dr. Lowe at CSULB. The goal is to further our knowledge of the abundance, distribution, age structure, movement, and fishing mortality of the California spiny lobster. Dr. Hovel is also involved in a collaborative effort with the Department to study the abundance, distribution, and movement of lobster in San Diego Bay funded by the Port of San Diego. Because commercial fishing is prohibited in San Diego Bay, the bay functions as

a “de facto” reserve, though sport fishing is allowed. By studying how lobsters move inside the Bay and between the Bay and outside where commercial fishing is allowed, we hope to understand some of the dynamics expected with the creation of MPAs in southern California. The Department has also been involved in a dialog to determine how fishery dependent data could be collected by commercial fishermen that would assist management of the fishery. In a project with Scripps Institution of Oceanography, Department staff is helping to count larval lobsters in nearly fifty years of bulk water samples collected during California Cooperative Oceanic Fisheries Investigations (CalCOFI) cruises. This effort, it is hoped, will create an index of spiny lobster spawning biomass in the southern California bight.

For more information on the California spiny lobster, go to the Department’s Marine Region website: www.dfg.ca.gov/marine

Red Sea Urchin

Statewide landings of red sea urchins in 2008 totaled 10.3 million pounds worth $6.5 million to fishermen. Both catch and value were below the 10-year averages of 12.3 million pounds worth $8.8 million exvessel. The red sea urchin fishery, which targets the spiny echinoderm for its roe, operates in two areas of the state: northern California between San Francisco and Cape Mendocino and southern California, below Point Conception and at the Channel Islands. While southern California landings in 2008 reached their lowest level since 1998, at 7.6 million pounds (whole weight), northern California improved to 2.6 million pounds, its highest total since 2002, and just below the 10-year average of 2.8 million pounds. The southern California 10-year average is 9.6 million pounds. Statewide fishery value has declined dramatically from the $33.7 million posted in 1991.

The sea urchin fishery is managed by limiting fishing days during the summer months, a minimum size limit, a maximum of 300 permits and a logbook requirement to provide detailed catch and effort information. There are currently 305 sea urchin permittees statewide, while 203 divers were active in 2008. Of these, 36 fished primarily in northern California. One of the primary causes of reduced landings during the past decade, especially on the north coast, appears to be declining market demand, particularly in the traditional Japanese market, rather than depressed stocks. Some sea urchin processors in southern California, where most of the divers operate, have put their divers on daily quotas in response to the decline, which has been exacerbated by the global recession. The industry has had limited success in expanding demand for their product domestically and some processors believe that the domestic market is maximized.

The California Sea Urchin Commission (CSUC), originally funded by an assessment on sea urchin landings paid in equal shares by divers and

processors, was launched in April 2004. The CSUC publishes newsletters, holds meetings, and has a system of port representatives to keep fishery participants informed of relevant news and activities. The CSUC and the industry have been grappling with a couple of issues with potential to impact the fishery, including the expansion of the sea otter population along the Santa Barbara coast and the establishment of marine protected areas (MPAs) in southern California.

The CSUC has also worked to establish a 'Barefoot Ecologist Program' in the Santa Barbara area for training commercial sea urchin divers to gather sea urchin size and density information in conjunction with their regular fishing activities, to be used in collaboration with Department collected fishery data. The San Diego Waterman's Association has been independently collecting similar information during their sea urchin harvesting operations in the Point Loma kelp bed.

For more information on sea urchins please see the following Department Marine Region web sites:
www.dfg.ca.gov/marine/seaurchin/index.asp
www.dfg.ca.gov/marine/asfr_2003.pdf

Abalone

Seven species of abalone are found in California: red, white, black, green, pink, pinto, and flat. Currently, only red abalone can be taken in a recreational free-diving fishery north of San Francisco Bay, primarily in Sonoma and Mendocino Counties. A brief commercial red abalone fishery in northern California was closed in 1945 but had never been a significant part of statewide landings. The commercial and recreational abalone fisheries south of San Francisco Bay were closed by the Legislature in 1997 due to a decline in the populations. Fishing pressure, predation by sea otters in central California, and the withering syndrome (WS) disease contributed to the population decline. Recovery of abalone populations in the closed areas has been slow, and except for San Miguel Island (SMI), no areas south of San Francisco Bay are being considered for the reopening of an abalone fishery.

The Abalone Recovery and Management Plan (ARMP) was written by the Department and approved by the Commission in December 2005. The ARMP outlines restoration strategies for depleted abalone stocks in central and southern California. It also describes the management approach to be used for northern California red abalone and eventually for other recovered abalone stocks. The Commission adopted the ARMP with the selection of an alternative which examines the potential for reopening a fishery on the SMI red abalone stock, depending upon the condition of that particular stock. Accordingly, the Department has initiated an evaluation of SMI red abalone populations to help inform the Commission's decision.

The Department embarked on the SMI fishery consideration process by applying a cooperative approach and empanelling a constituent group, the Abalone Advisory Group (AAG). The purpose of the AAG is to provide the Department and the Commission with a limited range of fully developed alternatives for managing a potential SMI fishery. To provide data for the SMI fishery consideration process, the Department and constituents developed a cooperative assessment survey of red abalone populations at SMI. Comprehensive red abalone surveys were conducted at SMI in 2006, 2007 and 2008. The AAG is currently working to calculate a sustainable total allowable catch for SMI.

Northern California Red Abalone

Department biologists are completing a draft of the northern California red abalone fishery status report for the Commission as required by the ARMP. Fishery independent dive surveys and three types of fishery dependent data (creel surveys, abalone report cards, and systematic telephone survey) are the primary data sources used to manage the recreational red abalone fishery with guidelines set forth in the ARMP.

The primary method of evaluating the status of red abalone populations is the estimation of abalone density using fishery independent SCUBA surveys at eight northern California index sites. The average density of red abalone at the index sites was 0.68 abalone/m^2. This density is within the sustainable fishery density defined in the ARMP.

Creel surveys interview abalone fishermen at heavily used sites and provide the Department with detailed catch and effort information which are designed to detect declines in local abundance. These surveys were started as annual surveys in the 1970s and are currently conducted every other year. Abalone report cards and telephone surveys also provide valuable fishery dependent data. Recreational abalone fishermen are required to record their catch on an abalone report card and return the card to the Department at season's end. Based on report card returns and a telephone survey of report card purchasers, the total catch for 2007 was estimated to be 309,000 abalone, a substantial increase over the next highest estimate of 264,000 in 2002 and 2006. The telephone survey included economic data which was used to estimate $11.3 million was spent for abalone trips in 2007 compared to $7.8 million in 2002.

Abalone report card catch location data for 2007 shows the Fort Ross area in Sonoma County continues to be the most productive location for abalone harvesting. Catch at this area, which includes two popular sites over a few miles of coastline, has nearly doubled between 2005 and 2007 and accounted for 20 percent of the 2007 total abalone catch.

The WS bacterial disease which devastated some southern California abalone populations has not made a noticeable impact on abalone populations in

northern California. The cool waters in the north apparently prevent the disease from adversely impacting abalone populations there.

Current data indicate the northern California recreational red abalone fishery is healthy but evidence of low reproduction, catch and effort increase at Fort Ross area sites, low densities of intertidal abalone and indications of significant illegal abalone catch all point to vigilant management of these important northcoast resources.

Southern Red Abalone

Assessment and exploratory surveys have been completed. This work began in 2005 as part of the initial task of monitoring population recovery under the draft ARMP. These surveys were conducted in conjunction with other established monitoring programs at the northern Channel Islands, including the Channel Islands Kelp Forest Monitoring Program and the Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO) program. Both programs also form a foundation for monitoring biological change within and outside the recently established Channel Islands Marine Protected Areas. Abalone data collected through these monitoring programs are also useful in fulfilling the goals of the ARMP. Recent size frequency data from surveys show that red abalone populations on the south portion of San Miguel Island already meet the broad size range recovery criterion outlined in the ARMP, but other nearby populations at Santa Rosa and Santa Cruz islands, do not yet meet this first criterion specification.

A comprehensive assessment of San Miguel Island was initiated in August 2006 as part of an exploration of the feasibility of reopening the red abalone fishery. Since then, consecutive surveys were conducted in 2007 and 2008. A final survey was completed in the fall of 2008. These are currently being analyzed. A report for 2006 and 2007 was submitted to the Abalone Advisory Group (AAG) and other interested parties with a description and documentation of the data gathered and methods used during the survey (metadata) to facilitate effective use of the data. These data were used in formulating a stock assessment for red abalone at SMI. The stock assessment creates the basis for determining a potential Total Allowable Catch (TAC) as part of the fishery consideration process. A final report that encompasses all three survey years is expected to be completed by the summer of 2009. These surveys will help inform any decision by the Commission to open a limited fishery at San Miguel Island.

White and Black Abalone

The Baby Abalone Recruitment Trackers (BARTs), deployed at Santa Cruz Island have been monitored at least once a year since their deployment in 2004. No white abalone has been seen yet, but other common invertebrate species such as sea urchins have recruited to the artificial habitats. A research cruise

was conducted in the spring of 2008 to look for white abalone around Santa Catalina Island. No live white abalone was found during the cruise. The federal white abalone recovery plan was completed in the fall of 2008.

NOAA Fisheries received a petition in December 2006 from the Center for Biological Diversity to list black abalone as endangered or threatened under the Endangered Species Act. The petition also asked that critical habitat be designated concurrent to the decision on listing. A black abalone status review report was drafted and finalized in the spring of 2008. Black abalone was listed as an endangered species by NOAA Fisheries on January 14, 2009. Black abalone populations in southern California remain severely depressed since the closure of the fishery in 1993. However recent evidence shows some recruitment and potential recovery at San Nicolas and Santa Cruz Islands. Current restoration research efforts have been focused on finding some sort of genetic-based disease resistance to Withering Syndrome, a disease that has devastated once abundant black abalone populations, and successful captive propagation of the species for recovery out-planting.

Pink and Green Abalone

Pink and green abalone surveys were conducted at the southern Channel Islands (Santa Catalina and San Clemente islands) from 2005 to 2008. Exploratory surveys are now complete for these species. Size frequency data at the survey sites show that while the broad size range criterion specified in the ARMP are not being met for either species, in some areas, green abalone were close to that criteria and showed evidence of recent reproduction and recruitment. Based on these surveys, it appears that achieving this first criterion level of recovery in the ARMP, will take a considerable time period.

In 2007, an extensive effort to survey the northern Channel Islands began and continued into the fall of 2008. Surveys for pink and green abalone were conducted mostly at Anacapa and Santa Cruz islands. Only a handful of adult abalone were encountered at Anacapa Island; although, more juvenile abalone of both species were encountered. Surveys at Santa Cruz Island also revealed very low densities of abalone; however, higher densities of pink abalone are being found at the east side of the island. Although these densities are far below the criterion level of recovery in the ARMP, this may be one area that is recovering and will be monitored in future surveys.

The Department has recently been funded to initiate an aggregation study with pink and green abalone at Santa Catalina, San Clemente, and Santa Cruz islands. This study began in the summer of 2008 and will go until the spring of 2010 and will involve aggregating and tagging abalone to monitor their survival, growth rates, and movement. Aggregation of wild adult abalone for successful spawning is listed as a potential recovery task to help enhance recovery efforts. If the study shows that active translocation/aggregation of abalone can form

persistent spawning groups, then the Department may consider using these recovery techniques on a larger spatial scale to enhance recovery. These data will also be useful to determine the effectiveness of aggregation in other species of abalone.

For more information, go to the Department's Marine Region website:
www.dfg.ca.gov/marine/armp/index.asp
www.dfg.ca.gov/marine/abalone.asp
http://ftp.dfg.ca.gov/Public/R7_MR/AAG/

Dungeness crab

California waters are the southernmost extent of the Dungeness crab, *Cancer magister*, range. California's most valuable commercial crab fishery began in the San Francisco area in the mid-1800s. In the 1940's, the fishery expanded rapidly to the northern portion of the state where most of the catch is now made. Both the commercial and recreational fishing seasons employ relatively simple management techniques and the resource appears to be sustainable over the long-term. With landing records dating back to 1916, information on the commercial catch and value is plentiful, but there is little information on the increasingly popular sport fishery.

The commercial fishery for Dungeness crab occurs in two main areas, northern California and central California, divided at the Mendocino-Sonoma county line near Point Arena. The main Central California fishing ports include Avila-Morro Bay, Monterey, San Francisco and Bodega Bay. The most productive grounds in central California are off San Francisco including the Gulf of the Farallones and waters north to the Russian River (Sonoma County). Dungeness crab fishing grounds off northern California are much larger and extend from Fort Bragg to the California-Oregon border, with the prime area located between Eureka and Crescent City. Crescent City has continued to have the largest season landing totals of all ports. Sport fishing from private boats and charter boats, or Commercial Passenger Fishing Vessels (CPFVs), occurs throughout the same range.

<u>Sport fishing</u>

With fewer ocean sport fishing opportunities on the north coast, popularity of sport crabbing is rising. Crabbers are allowed a bag and possession limit of 10 crabs per day and a smaller than commercial size limit of five and three-quarter inches wide. Effective November 2008, the Commission expanded the sport season. It now opens annually on the first Saturday of November and runs through July 30 in northern California and June 30 in central California. The change gives sport fishers several more weeks of crabbing before they encounter commercial gear on the crab grounds. A month long creel survey by the Department in November 2008 showed that crabbers in Eureka and Crescent

City regularly had limits of hard-shelled male crabs that were large enough to be commercially legal. Commercial Passenger Fishing Vessels (CPFVs) operate from various ports, offering a fishing opportunity to sport crabbers without their own vessel. CPFVs are most numerous in the San Francisco/Bodega Bay area. Other productive ports include Fort Bragg and Trinidad. In central California, sport crabbers aboard a CPFV have a reduced limit of only six crabs per day and an increased size limit of six inches wide. Rough estimates put the combined coastwide private and CPFV sport catch at about one percent of commercial catch.

Commercial fishing

Access to Dungeness crab fishing permits was restricted in 1995. A limited entry permit system was enacted by the legislature with the provision that most permits are transferable. There was a total of 600 permits in the 2007-08 season and only 385 made a landing. However, there is concern among some fishermen that an increase in the use of latent permits could cause overfishing and further overcrowding of crab fishing grounds.

The Dungeness crab catch has followed a cyclical pattern, with peaks and troughs approximately every 7 to 12 years. The 2003-04 through 2005-06 seasons were among the highest commercial catches on record. As expected, the 2006-07 and 2007-08 catches decreased significantly. Preliminary landings for 2007-2008 totaled 8.36 million pounds, a 38 percent decrease from the previous season, which was approximately equivalent to the 10-year moving average. It was a 67 percent decrease from 2004-05 season, the second highest season on record. Landings in the central and northern areas decreased at about the same proportions.

Despite the decrease in catch, a relatively high price per pound kept the ex-vessel value robust - maintaining Dungeness crab as one of the most valuable fisheries in California. The 2007-08 season was worth $23.0 million, a 24 percent decrease from the previous season but only 6 percent less than the 10-year average. The average price paid to fishermen was $2.75 per pound, a slight increase from $2.58 per pound the previous season. The 2008-09 season is showing signs of a continuing cyclical decline. As of January, the statewide catch was just over 5.0 million pounds, with an average exvessel price of just over $2.00 a pound. Additionally, the catch is almost entirely attributed to the northern area. The central area catch is disproportionately down this year, so far landing only about 700,000 pounds. Very low catch per unit effort was reported by fishermen this season, especially in central California.

Management

The Dungeness crab fishery is one of the last major commercial fisheries in California managed by the state legislature, and management is based on the

"3-S principles" – sex, season, and size. Only male crabs over six and one quarter inches wide may be retained in the commercial fishery. This helps protect the reproductive potential of the populations. The fishery also utilizes open and closed seasons intended to avoid fishing during molting and mating times. The central California season opens November 15 and continues through June 30, whereas the northern California season opens conditionally December 1 and continues through July 15. The earlier opening in the central area lures many northern boats south and can lead to intense fishing pressure and crowded fishing grounds.

California, Oregon and Washington share many management concerns and coordinate on interstate issues through the Tri-State Dungeness Crab Committee. Each year, northern California synchronizes its northern opening date based on a standardized crab quality test also conducted in Oregon and Washington. The quality test, carried out in November, shows whether there will be sufficient meat gained inside the newly molted shell by December 1. The season usually starts on schedule except in 2004-05 when the Director did authorize a delay. The last important interstate development, effective in 2007, was the reciprocal Limited Entry 200 agreement established with Oregon under authority provided by the Magnuson Stevens Fisheries Conservation Act. State permits are now required in their state waters and in their adjacent federal waters. This agreement stemmed in part from Oregon's adoption of trap limits among other newly adopted regulations such as logbooks.

The Dungeness crab fishery is considered a "derby fishery" meaning much of the total catch is caught in a relatively short period of time at the beginning of the season. Despite winter storms in late 2007 and the *Cosco Busan* oil spill-delayed central California opening, 56 percent of the total catch was landed by January 15 – only 6 weeks into the more than seven month long season.

In recent years, the most pressing issue has been the number of traps deployed in both central and northern California. In California, there is no limit to the number of traps a boat may fish or the frequency with which they are fished. Complaints of overcrowded fishing grounds, particularly in the central California, have continued. Some vessels fish over 1,000 pots; some fish day and night using bright lights. Economic studies have pointed out a huge over-investment in gear; much more is being used than is actually needed to catch all crabs for the season. According to a 2003 CalCOFI report based on a fisherman survey, there were at least 172,000 traps being fished in California during the 2001-2002 season. No recent or official estimates have been made. However, if Oregon is any indication, their estimated number of traps soared from 150,000 in 2002 to 200,000 in 2005 before implementation of a trap limit. Traps are frequently lost or buried in storms and litter California crab grounds and beaches. They can become hazards for vessels and marine mammals. Documented and potential mammal entanglements have led NOAA to elevate the California and Oregon Dungeness crab fisheries to Category II on the 2009 List of Fisheries, as required

by the Marine Mammal Protection Act. All Dungeness crab vessels are now required to carry a Marine Mammal Authorization Permit.

In 2008, Dungeness crab fishermen began working on a cooperative approach to managing their fishery. Their effort resulted in SB1690 (Wiggins), which mandates the Ocean Protection Council to create a limited-term Dungeness Crab Task Force (DCTF). The DCTF objective is to make recommendations on management measures to the Joint Committee on Fisheries and Aquaculture, the Department and the Commission in January 2010. Meetings are expected to begin in early April 2009. Anticipated discussion topics include trap limits, fleet size reduction and season opening date changes among many others.

For more information, go to the Department's Marine Region website: www.dfg.ca.gov/marine/dungeness_crab.html

Federal/State Managed Fisheries

Pacific Salmon

The Pacific Fishery Management Council's (Council) Salmon Fishery Management Plan (FMP) was developed in 1977 and was the first FMP implemented by the organization. Each year, the PFMC develops management measures that establish fishing areas, season dates, harvest quotas, legal fishing gear, minimum size lengths, and possession and landing restrictions for salmon taken in federal and state waters off California, Oregon, and Washington. These measures must meet the goals of the FMP that address spawning escapement needs, allow for freshwater fisheries, and meet the needs of salmon species listed under the federal Endangered Species Act (ESA). The ESA requires that the National Marine Fisheries Service (NMFS) assess the impact of ocean fisheries on listed salmon populations and develop standards that avoid the likelihood of jeopardizing the continued existence of those populations. Measures recommended by the Council must be approved and implemented by the Secretary of Commerce. The Commission then modifies Title 14 so that the same regulations are in effect for recreational ocean salmon fishing in California state waters (less than three miles from shore).

Ocean salmon fisheries harvest a mixture of stocks that can differ greatly in their respective abundance and productivity. Managers develop measures that selectively protect stocks of concern based on differences in life history and distribution by time and area of "strong" and "weak" stocks. The Commission, the Council, and the NMFS have implemented various protective regulations to reduce fishery impacts on populations of Sacramento River winter Chinook, Central Valley spring Chinook, and California coastal Chinook and coho. All of these stocks are listed under both federal and State ESAs. Ocean harvest of Chinook must also be constrained to meet the FMP spawner escapement goal of

Klamath River fall Chinook and to provide for the federally reserved fishing rights of the Yurok and Hoopa Valley tribes.

Of the five species of Pacific salmon found on the West Coast, Chinook and coho are most frequently encountered off California; however the retention of coho salmon has been prohibited in all California ocean fisheries since 1995. Small numbers of pink salmon are landed on occasion. Chum salmon and sockeye salmon are rarely seen in California.

In April 2008, the Council, National Marine Fisheries Service (NMFS), and the Commission closed all commercial and recreational ocean salmon fisheries in California due to a significant decline in Sacramento River Fall Chinook (SRFC).

In 2007, an estimated 87,881 SRFC adults (ages three, four, and five) returned to spawn in the Sacramento River Basin. This escapement was below the annual conservation objective of 122,000-180,000 adult spawners required by the Council's Salmon Fishery Management Plan (FMP) and is the third lowest on record. Additionally, a total of 1,897 SRFC jacks (age two fish) returned in 2007 (lowest on record), fishery scientists forecasted a 2008 ocean abundance of 59,100 SRFC salmon adults. Even without any additional ocean and inriver fishing in 2008, the SRFC would not meet their FMP spawner goal and a Conservation Alert was triggered. It was also estimated that the number of adult spawners returning to state and federal hatcheries would be well below the 22,000 SRFC adults needed to meet annual egg-take goals.

In 2008, an estimated 66,264 SRFC adult (ages three, four, and five) salmon escaped to the Sacramento River Basin to spawn (the lowest adult escapement on record). In addition, an estimated 4,061 SRFC jacks (age two fish) also returned to spawn (second lowest on record). Fishery scientists forecasted a 2009 ocean abundance of 122,196 SRFC ocean adults and without further fishing would predict an adult spawner escapement of 122,196 SRFC adult salmon (the minimum escapement goal is 122,000 SRFC adult natural spawning and hatchery fish). The 2009 ocean abundance forecast has approximately 63,100 more fish than the 2008 forecast of 59,100. While the 2009 ocean abundance forecast is roughly twice the abundance of last year's unprecedented low, this would predict the third lowest adult escapement of SRFC since 1992. Consequently, in the Council process for 2009 there are only 10 days of recreational ocean fishing available within the full range of management options for California. Those 10 days are contained within the Klamath Fishery management Zone in the far north of the state to try to take advantage of returning Klamath Fall Chinook in the late summer. There are no options with any commercial fishing and no other ocean sportfishing opportunities. Decisions about 2009 salmon fishing will take place in April at the Council meeting and the Commission meeting.

For more information, go to the Department's Marine Region and the Council websites:
www.dfg.ca.gov/marine/oceansalmon.asp
www.pcouncil.org/salmon/salsafe08/salsafe08.html

Market Squid

The California commercial market squid fishery began in the mid 1800s and has grown to be one of the state's largest fisheries. In 2008, market squid was the second largest fishery in terms of volume and the most valuable fishery. Statewide, 76.5 million pounds (34,700 metric tons) of market squid were landed in 2008 with an ex-vessel value of $23.9 million. In 2007, the fishery landed 109.7 million pounds (49,802 metric tons) and was worth $25 million. From 1999 to 2007, the market squid fishery averaged $25 million in value and 149.3 million pounds (67,000 metric tons) in landings. The average price per pound increased from $0.27 in 2007 to $0.31 in 2008.

Traditionally, market squid are targeted at the end of their life span on spawning grounds adjacent to Monterey, the Channels Islands including Catalina, and the mainland coast south of Point Conception. Fishing usually takes place during the night, and market squid are located by light boat vessels using sonar. In the Monterey area, the fishery is most active during the summer months; whereas in southern California, the majority of market squid landings take place during winter months.

The presence of market squid is strongly correlated with environmental factors, such as water temperature and nutrient availability. Although the majority of landings usually occur in southern California, landings in Monterey have been considerably lower since 2005. The decline in squid landings has been attributed to the cyclical nature of the market squid population and changes in environmental conditions. When squid are abundantly available the demand of the commercial market becomes the limiting factor.

Market squid is a federally monitored species and a state managed fishery. In 2005, the Commission adopted the Market Squid Fishery Management Plan (MSFMP), which implemented a series of fishery control rules. A harvest guideline of 236 million pounds (107,048 metric tons) for each fishing season (April 1 through March 31 of the following year) was enacted. Weekend closures, which began in 1984, were preserved in order to protect a portion of the actively spawning biomass by allowing for periods of un-interrupted spawning each week. Large-scale gear closure areas such as the leeward side of Catalina Island and Santa Monica Bay were preserved to protect squid spawning, and additional closure areas have become established to protect squid spawning through the ongoing Marine Life Protection Act marine protected area program. A 30,000 wattage restriction and shielding requirements were adopted for squid attractant lights to reduce disturbance of nearby bird and urban populations as

well as an exclusion of the use of squid lights in the Gulf of the Farallones National Marine Sanctuary. And, a limited entry program was also implemented under the MSFMP.

In 2008, 93 vessel permits, 62 light boat permits, and 22 brail permits were issued. Of the 93 vessel permits issued, 71 vessels made commercial landings in 2008, as compared to 65 active permitted vessels in 2007. 42 vessels made 90 percent of the landings in 2008.

Pacific Sardine

The Pacific sardine, *Sardinops sagax*, has been a major component of California's commercial fisheries. The historic sardine fishery existed from the early 1900's, crashed in the 1940s, and saw resurgence in the late 1980s. In 2008, sardine was California's largest fishery by volume and fourth in ex-vessel value. Statewide landings in 2008 were 127.4 million pounds (57,794 metric tons) with an ex-vessel value of approximately $7.6 million. This was a 29 percent decrease in volume from 2007, in which landings were estimated at 178.5 million pounds (80,980 metric tons) with an ex-vessel value of approximately $8.2 million. In addition, the average price for sardine increased from $0.05 per pound in 2007 to $0.06 per pound in 2008. Landings occurred mainly in the San Pedro-Terminal Island, Ventura-Port Hueneme, and Monterey-Moss Landing port complexes. The 2008 California Coastal Pelagic Species limited entry fleet consisted of 65 permits and 61 vessels.

The 2008 fishery for Pacific sardine was unique in that the coast-wide harvest guideline (HG), as adopted by the Council, was reached. This is the first time since its resurgence that the sardine HG had been achieved. In November 2007, the Council adopted a total HG of 89,093 metric tons for the 2008 Pacific sardine fishery which extends from California to Washington. The directed Pacific sardine fishery was officially closed by NOAA Fisheries on September 23, 2008.

In November 2008, the Council adopted a HG of 66,932 metric tons for the 2009 Pacific sardine fishery based on a biomass estimate of 662,886 metric tons.

Nearshore Finfish Management

Nineteen nearshore species are managed under California's Nearshore Fishery Management Plan (NFMP) implemented in 2002; 17 are also jointly managed according to the federal Pacific Fishery Management Council's (Council) Groundfish FMP. Rockfish species identified in the NFMP include black, blue, gopher, China, grass, brown, olive, copper, treefish, calico, and quillback rockfishes and are referred to as the minor nearshore rockfishes. The other species in the NFMP include cabezon, California scorpionfish, greenlings, California sheephead, and monkey-face prickleback; the latter two are exclusively state-managed. Management of these species follows the federal

biennial cycle, so that regulations and harvest limits are implemented for a two-year rather than a one year period. In 2008, new 2009-2010 management regulations were adopted affecting nearshore fisheries.

The commercial fishery is generally regulated by a combination of allowable fishing depths, trip limits, and season adjustments to prevent catches from exceeding specified harvest limits. Federally designated "overfished" groundfish species including canary, cowcod and yelloweye rockfishes are protected with very low harvest limits (bycatch only) while stocks rebuild (see Groundfish Management section), and these low harvest limits continue to constrain fishing opportunities for associated nearshore species. Final management measures depend on the adopted harvest limits and resulting allocations to fishery sectors. The Department in conjunction with the Council developed fishing regulations that maximize fishing opportunities as much as possible while continuing to conserve these "overfished" stocks.

The results of recent assessments and implications for harvest limits for 2009-2010 are provided below in Table 1. According to the NFMP, "healthy" stocks are those for which the estimated stock size is at or greater than 60 percent of an unfished stock size and "precautionary" stocks are those stocks for which the estimated stock size is at or above 30 percent of the unfished stock size. New harvest limits were determined for black and blue rockfishes, and cabezon, based on the latest stock assessment information. Increases in optimal yields (OYs) and resulting harvest limits translate into more fishing opportunities for recreational and commercial fishermen.

Table 1. Current status of recently assessed nearshore stocks and harvest limit outcomes for 2009-2010.

Species	Most Recent Stock Assessment	Population Status	2009-2010 FINAL OY
Black rockfish	2007	Healthy	Increasing
Blue rockfish*	2007	Precautionary	Harvest target set
Gopher rockfish*	2005	Healthy	No change
Ca scorpionfish*	2005	Healthy	No change
Cabezon	2005	Healthy	Increasing 2010

*Assessment team lead by (blue and gopher rockfish) or included CDFG staff.

<u>Restricted Access Nearshore Fishery</u>
Nearshore Fishery Permit

In 2003, the Department began a restricted access program for the commercial nearshore fishery that affected the landings of ten nearshore species referred to as the shallow nearshore group. The group consists of: black-and-yellow, gopher, kelp, China, and grass rockfishes, kelp and rock greenling, California

scorpionfish, California sheephead, and cabezon. This program was established with four regions defined in California Code of Regulations, Title 14, (Table 2). Permit holders are allowed to land these nearshore species only for the region for which the permit is issued when fishing is permitted. Permits are transferable or non-transferable. A total statewide capacity goal of 61 permits was specified to assure fishery sustainability; the statewide total was derived from the regional goals shown in Table 2. When the program began in 2003, a total of 224 Nearshore Fishery Permits was issued. By comparison, in 2008, that number decreased to 180 permits. The number of actively fished permits was 140 in 2008, based on the number of permittees whose annual landings of permit species exceeded 100 pounds.

Table 2. Nearshore Fishery Permits by Region

Region	**Boundaries**	**Capacity Goal**	**Active Permits in 2008**
North Coast	Oregon-California border south to 40°10' N latitude (near Cape Mendocino, Humboldt County)	14	26
North-Central Coast	40°10' to Point Año Nuevo (San Mateo County)	9	29
South-Central Coast	Point Año Nuevo to Point Conception (Santa Barbara County	20	61
South Coast	Point Conception to the California – Mexico border	18	64
Total Permits		61	180

Deeper Nearshore Fishery Permit

Also in 2003, a deeper nearshore species fishery permit system was created with non-transferable permits that allow the catching and landing of eight deeper nearshore rockfishes on a statewide basis and capped the level of participation. These species include: black, blue, brown, calico, copper, olive, quillback, and treefish rockfishes. When the program began in 2003, a total of 292 permits were issued. By comparison, in 2008, that number decreased to 230 permits. Of these 230, 94 could be considered “active” based on the criteria above.

2008 Commercial Nearshore Landings

In 2008, 592,858 pounds (270 metric tons) of nearshore permit species were landed statewide generating an ex-vessel value of $2.7 million dollars. The total ex-vessel revenue generated by nearshore rockfish species, cabezon, greenlings, California sheephead and California scorpionfish is provided in Table 3. The nearshore live fish fishery evolved from the demand for specialty foods in Asian restaurants and markets in southern California. What started out as an alternative fishery quickly expanded into a multimillion dollar industry by the early 1990s. In 2008, the nearshore live-fish component of the fishery accounted for 82 percent of all nearshore species landed.

Table 3. Ex-Vessel Revenue by Region for Nearshore Species Groups

Region	Nearshore Rockfishes	Cabezon, Greenlings	CA Sheephead	CA Scorpion-fish	All Species
North Coast	$559,242	$21,188	$0	$0	$580,430
North-Central Coast	$298,404	$47,014	$0	$0	$345,418
South-Central Coast	$959,139	$201,134	$2,513	$0	$1,162,786
South Coast	$163,231	$58,809	$396,644	$25,876	$644,560
Total	**$1,980,016**	**$328,145**	**$399,157**	**$25,876**	**$2,733,194**

For more information, go to the Department's Marine Region website: www.dfg.ca.gov/marine/groundfishcentral/index.asp

Groundfish

Approximately 92 species of bottom-dwelling marine fishes are included in the federal Groundfish Fishery Management Plan (FMP) implemented by the Council in 1982. Since then, these species have been managed under the joint jurisdiction of the state and the federal government. Species and species groups managed under the FMP include all rockfishes (about 60 species), sablefish, thornyheads, lingcod, Dover sole and other flatfishes (not including halibut), Pacific whiting, and some sharks and rays.

The 2008 commercial groundfish landings for all gears in California totaled 28.8 million pounds (11,359 metric tons). This represents an increase of approximately 5.6 million pounds (2,540 metric tons), or 19 percent, from 2007 to 2008. The 2008 ex-vessel value was $18.9 million dollars, an increase of three million dollars over the previous year.

The recreational fishery harvest in California totaled 2.3 million pounds (1,043 metric tons) in 2008. This represents a 27.3 percent decrease compared to 2007. Approximately 65 percent of the recreational groundfish catch for 2008 occurred north of Point Conception. Recreational fishing effort, especially north of Point Conception, is often severely constrained by depth restrictions in order to conserve federally designated "overfished" species like canary and yelloweye rockfishes which often occur in deeper water. The California Recreational Fisheries Survey (CRFS) provides catch and effort estimates for marine recreational finfish fisheries. New efforts were undertaken in 2008 to more closely monitor the catch of "overfished" species. As a result, total annual recreational harvest by species or species group did not exceed California's harvest guidelines.

"Overfished" federal groundfish species including canary, cowcod and yelloweye rockfishes are protected with very low harvest limits (bycatch only) while stocks

rebuild. These low harvest limits for “overfished” species also constrain fishing opportunities for healthy fish stocks found in association with the “overfished” species. The commercial fishery is generally regulated by a combination of allowable fishing depths, trip limits, permit and gear restrictions, and season adjustments to prevent catches from exceeding harvest limits. The recreational fishery is regulated using bag limits, seasons, area closures, and depth restrictions. Depth-based Rockfish Conservation Areas (RCAs) implemented in 2003 continue to be used to protect species of concern by closing their primary depth range to groundfish fishing. The RCA closures are expected to remain in place until “overfished” stocks are rebuilt or a better management approach is adopted. The RCA depth boundaries have been modified to accommodate healthy fisheries as much as possible and change throughout the year to increase or restrict access as needed. Enforcement of the RCAs has been enhanced by the federal requirement of electronic Vessel Monitoring Systems (VMS) to be on board all commercial fishing vessels with federal Limited Entry permits.

Additional tools are currently being developed and implemented through the Council process to enhance groundfish fisheries management. The Council is continuing development on a program (Trawl Rationalization) which will assign individual quotas (IQ) for target species and species complexes to individual trawl permits. The Trawl IQ program will move the fleet toward greater accountability for fishing behavior while reducing discards and overall by-catch in the trawl fleet.

For more information, go to the Department’s Marine Region website: www.dfg.ca.gov/marine/groundfishcentral/index.asp

California Recreational Fisheries Survey

The California Recreational Fisheries Survey (CRFS) began January 2004 to provide timely and accurate recreational angling catch and effort estimates to manage California’s marine recreational finfish fisheries on a sustainable basis. CRFS is a joint effort between the Department and the Pacific States Marine Fisheries Commission (PSMFC) with funding from state and federal sources.

CRFS generates monthly estimates of total recreational catch by species for six geographic districts along California’s coast. The program provides information on where and when fish were caught and whether they were kept or released. State and federal fishery managers can track catch and make in-season responses if catches are projected to be higher or lower than expected before the end of the fishery year. Managers examine catch rates, average fish lengths and weights and other fishery information collected by CRFS to monitor changes in the fisheries. CRFS data are used to help determine if catch or season limits need to be changed.

The CRFS protocol consists of a multi-part survey combining field sampling and telephone surveys. The field sampling is conducted during daylight hours at publicly-accessible sites. Samplers intercept anglers upon the completion of fishing activity at beaches, piers, jetties, onboard commercial passenger fishing vessels, and at public launch ramps. Samplers conduct a voluntary interview with intercepted anglers about fishing activities and catch, and obtain biological catch information. Samplers cannot sample angling effort that occurs at night or from boats that depart from and return to private marinas. For these areas where field sampling cannot be conducted, a telephone survey of licensed anglers is used to obtain fishing effort information. A different telephone survey is conducted to obtain commercial passenger fishing vessel effort information. The field sampling, angler telephone survey, commercial passenger fishing vessel telephone survey, and information on sport fishing license sales are combined to estimate total recreational fishing effort and catch.

In 2008, approximately 45 samplers were employed statewide to gather recreational fishing effort and catch data. The CRFS samplers interviewed more than 61,400 anglers at more than 400 sites, and examined almost 188,000 fish. The licensed angler telephone survey completed 26,000 interviews in 2008 which is comparable to the number of interviews completed in 2006 and 2007.

Anglers took an estimated 4.1 million trips to fish for marine finfish in California in 2008. Fifty-eight percent of those trips were taken by anglers fishing in San Diego, Orange, and Los Angeles counties, ten percent by anglers in Ventura and Santa Barbara counties, and thirty-two percent by anglers north of Point Conception (Santa Barbara County). The five fishes most commonly taken by anglers from San Diego, Orange and Los Angeles counties included: Pacific mackerel, jacksmelt, Pacific sardine, and barred sandbass.

In 2008, the CRFS program began two pilot studies to verify the estimates of effort and catch for night fishing and fishing from boats that depart from and return to private marinas.

The Marina Study is developing improved methods for collecting and estimating fishing effort for private and rental boats returning to private-access sites. Samplers are stationed at entrances to seven marina sites in San Diego, Orange, and Los Angeles counties. They count the number of returning boats and determine if the passengers appear to be returning from sport fishing trips. The data are expanded to the population of all marina sites within those counties and monthly estimates of private-access fishing effort are generated. The estimates are compared to the estimates currently generated from the licensed angler telephone survey. The study will conclude in September 2009.

The Saltwater Angler Logbook Study is a comparison of the fishing activities of boating anglers who depart from public-access sites with the fishing activities of anglers who depart from private-access sites. The goal is to compare fishing

effort, and catch and discard rates by species between the two populations of anglers. Each participant is a volunteer recruited from an angler database, and each is provided with paper logs to document monthly fishing activity. Currently, there are 614 public-access and 324 private-access volunteers. Recruitment efforts are ongoing to increase the number of private-access panelists. Participating anglers receive a monthly newsletter, outreach material, and are eligible for a monthly prize drawing. The study will conclude in October 2009.

For more information on the CRFS program and related agencies and surveys, please visit the Department's Marine Region CRFS website: www.dfg.ca.gov/marine/crfs.asp

Habitat Conservation

Marine Life Protection Act Process

The MLPA, passed in 1999, requires the Department to develop a master plan for Marine Protected Areas (MPAs) in California that includes information on specific site recommendations, implementation and phasing, funding, monitoring, enforcement and management. The MLPA contains specific goals for MPAs including, but not limited to, ecosystem protection, protecting representative habitats, helping sustain marine populations, improving the existing array of MPAs, and ensuring that the new system functions, to the extent possible, as a network.

The MLPA Initiative began in late 2004. It is a comprehensive process, funded by a public/private partnership, which is taking a regional approach to the implementation of the MLPA. The Initiative process includes the following primary entities:

- The Blue Ribbon Task Force (BRTF), appointed by the Secretary for Resources, which provides guidance and oversight;
- A Science Advisory Team (SAT), which provides scientific advice on the development of proposed MPA packages, species likely to benefit from MPAs, marine habitat considerations, and MPA goals and objectives;
- A Regional Stakeholder Group (RSG), with the primary objectives of:
    - developing regional goals and objectives for a network component of MPAs;
    - developing MPA-specific objectives;
    - reviewing existing MPAs relative to goals and objectives; and
    - developing alternative MPA proposals as required by the MLPA;
- A stakeholder-based Statewide Interests Group (SIG), which provides guidance to the BRTF on the MLPA Initiative process;
- Department of Fish and Game staff, who provide fisheries management expertise, scientific input, policy advice, review alternative MPA proposals for feasibility, and other informational and staffing needs; and

- MLPA Initiative staff and contractors, who provide professional facilitation at meetings, a GIS data base for informational needs and mapping, contracted research, review of all documents, and other critical process needs.

Regional Planning Updates

Central Coast Study Region (CCSR):
MPAs in the CCSR, which encompasses the area from Point Conception to Pigeon Point, became effective in September 2007. A collaborative baseline data collection project was carried out in spring and summer of 2008 to help inform future evaluation and management of the MPA network. Outreach and public education continue to be high priorities in progress as significant collaboration between Department project staff and collaborators in developing signage, booklets, etc.

North Central Coast Study Region (NCCSR):
MPA planning for the NCCSR, which spans from Pigeon Point to Point Arena, occurred during 2007 and early 2008. In April 2008, the North Central Coast Regional Stakeholder Group (NCCRSG) held their final meeting in conjunction with the BRTF to present their three final proposals for MPA arrays. During the meeting, the BRTF created a fourth proposal known as the Integrated Preferred Alternative (IPA) based on key components from each of the NCCRSG three proposals. All four proposals were forwarded by the BRTF to the Commission in June 2008, with the IPA receiving the highest consideration for the preferred alternative. The Commission's regulatory process is still underway with an adoption hearing anticipated for late summer 2009 to adopt a final set of MPAs and certify the final Environmental Impact Report.

South Coast Study Region (SCSR):
Beginning in June 2008, the MLPA Initiative held a series of workshops in the South Coast Study Region (SCSR), which runs from Point Conception to the U.S./Mexican Border, to inform stakeholders and the public about the upcoming MLPA process in the SCSR. This is the third study region to begin the MLPA planning process. Selection of a new SAT, new South Coast RSG members, and a new BRTF for the SCSR was completed by October 2008, when the first meeting of the South Coast Regional Stakeholder Group was convened to develop alternative MPA proposals for the SCSR. The SAT and Department will evaluate these proposals relative to how well they meet scientific guidelines developed by the SAT and follow Department feasibility criteria, as well as their prospects to meet the MLPA goals. An iterative MPA proposal revision process will continue through September 2009. The BRTF will consider the proposals, their evaluations, and potential socioeconomic impacts and select a preferred alternative. The BRTF will then forward the final proposals and their recommendation for a preferred alternative to the Commission between October and December, which will initiate the Commission's formal regulatory process

with additional opportunities for public input. The Commission is expected to adopt a final set of MPAs for the SCSR some time in mid-2010.

North Coast Study Region (NCSR):
Outreach in advance of MPA planning in the NCSR, from Point Arena to the California/Oregon border, may commence in early summer of 2009 with a series of public workshops and call for nominations to form a regional stakeholder group and new Science Advisory Team. Planning will overlap somewhat with completion of planning in the SCSR.

For more information, go to the Department's Marine Region website: www.dfg.ca.gov/mlpa.