

California's North Coast Fishing Communities Historical Perspective and Recent Trends



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California's North Coast Fishing Communities Historical Perspective and Recent Trends

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National Standard 8 of the Magnuson-Stevens Fishery Conservation and Management Act requires that fishery managers consider the importance of fishery resources to fishing communities, to provide for their sustained participation and to minimize adverse economic impacts on them, consistent with conservation objectives. Similarly, California's Marine Life Management Act mandates the use of socioeconomic as well as biophysical Essential Fishery Information to meet fishery management goals. Information on how individual fisheries and port communities operate is important to meeting these mandates. Yet, in-depth social science information on California fishing communities remains quite sparse.

The purpose of the Fishing Communities Project was to provide detailed historical and current social science information on four Northern California port communities – Crescent City, Trinidad, Eureka/Fields Landing, and Noyo/Fort Bragg. In addition to profiling each community, the project also provides a regional overview that encompasses the three counties – Mendocino, Humboldt, and Del Norte – in which these communities are situated. While this report is intended to help address fishery management needs, it can be used in a range of processes, from local planning and education to state and regional policy issues.

This regional overview provides county-level demographic and economic information, a discussion of fishery regulations, and customized summaries of commercial and recreational fishery data for the three North Coast counties and the tri-county region. The demographic and economic data contained in that overview illustrate the larger context within which North Coast fishing communities operate and adapt to change, and are also suggestive of how life in rural areas contrasts with the largely urban environment in which

most Californians live. Each individual port profile provides the history of that community and its fisheries, present-day fishery operations, activities and associated infrastructure, and identifies key regulatory and economic factors highlighted by study participants that interact with and affect the local fishing community.

The regional and port profiles reflect, respectively, regionally and locally relevant activities and influences. In situations where a factor (e.g., fishery regulations, market influences) is common to the region and/or to multiple ports, that factor is discussed in those profiles for which it is relevant. While this introduces some redundancy among profiles in terms of the information provided, it also allows each profile to be read and used as a stand-alone document.

The information presented is based on the collection and integrated analysis of archival and field data to interpret patterns, variability and change within and across fisheries and the fishing community over time. Data sources include:

- Commercial fish landing receipt data for the period 1981–2007 reconfigured into 34 distinct species/gear combinations;
- Commercial Passenger Fishing Vessel (CPFV) logbook data for the period 1980–2007;
- An extensive review of the published and gray literature, including fishery status reports and historical fishery statistics (as available);
- Statistics from the U.S. Census Bureau and other government sources of demographic and economic data; and
- Field observation and interviews and group meetings with more than 180 fishery participants and other knowledgeable individuals.

Demographic and Economic Overview

The three North Coast counties are rural and sparsely populated, in sharp contrast to the

highly urban nature of other coastal counties in California. Relative to California as a whole, the North Coast population is generally older, more limited in terms of income and education, and less racially diverse. Unemployment rates have historically been much higher in these counties than the state, although that gap narrowed considerably by 2009 due to statewide increases in unemployment associated with the current recession. In 2007, private sector business activity in the three North Coast counties involved 6,884 establishments (employing 67,326 people) and an additional 20,935 self-employed individuals. Major sources of private sector employment include construction, manufacturing, retail trade, health care/social assistance, and accommodation/food services. Earnings in the three counties totaled \$5.7 billion in 2007: 16% in proprietor income, 61% in private earnings, and 23% in government earnings.

Fishery Infrastructure and Market Development

Since long before white settlement, the natural resources of the North Coast have been a critical source of sustenance and cultural significance to local Indian tribes. In the mid-1800s, a large influx of White settlers came to the North Coast, lured by the prospect of gold. As the gold rush slowed in the late 1800s, residents turned to other plentiful natural resources in the area – massive redwood forests and abundant fishery resources such as salmon, groundfish and crab. Timber harvesting was the primary industry for many decades, particularly after World War II with the U.S. housing boom. However, by the 1960s, an estimated 90% of the redwoods were gone. As logging declined, fisheries became an increasingly important industry in this remote region.

The establishment of North Coast fisheries could not have occurred without market

development, adequate transportation routes, and establishment of key infrastructure. Until the early 20th century, the only way to get fish from the North Coast to market was by sea, which often proved hazardous due to rough seas. In the early 1900s, the Northwestern Pacific Railroad linked North Coast communities with cities further south. The construction of Highway 101 in the late 1920s (in conjunction with mass production of automobiles) brought tourists, including sport fishermen, to the area. In the 1940s, the U.S. Government began purchasing seafood in large quantities to feed soldiers overseas during World War II. In subsequent decades, U.S. consumers fueled that demand as their seafood preferences expanded and diversified.

In addition to requiring markets and efficient transportation, fishery development also required local, fishery-specific infrastructure. The development of such infrastructure at North Coast ports occurred as follows:

Crescent City: In 1950, locals in Crescent City built Citizen's Dock to support local fishing activity. In 1964 a devastating tsunami took 11 lives and destroyed most of the town and the docks. Relief funds enabled the re-development of the harbor through the construction of a boat basin, offloading docks, and two processing plants. By the early 1970s, Crescent City Harbor was a 'state-of-the-art' fishing port, well positioned to support the expansion of commercial and recreational fisheries.

Trinidad: The Hallmark family constructed the Trinidad Pier in 1946 and a mooring basin soon after. Trinidad became an active fishing village, with smokehouses and a sizeable seasonal fleet of salmon trollers by the late 1970s. Charter fishing operations, first established in 1952, provided recreational fishing opportunities for visitors and residents alike.

Eureka/Fields Landing: Beginning in 1914, the establishment of rail service to the San Francisco Bay area facilitated the transport to market of higher volumes of salmon, crab and groundfish (caught mostly in Humboldt Bay at that time). By 1929, trawlers were active along the North Coast and specifically in the Eureka area, where they delivered their catch for shipment to larger population centers by rail. Over the next several years, Eureka became a center of trawling activity. Many seafood companies (some of which originated in San Francisco) started businesses along the waterfront in Eureka and Fields Landing, and groundfish catches increased dramatically. The establishment of extensive processing capacity in Eureka also had repercussions elsewhere on the North Coast. For instance, Eureka Fisheries also developed receiving and processing plants at Crescent City and Fort Bragg, as well as wholesale/retail operations in the San Francisco Bay area.

Noyo/Fort Bragg: In 1950, the Noyo Harbor District was established, and in the 1960s, both the Noyo mooring basin and the privately owned Dolphin Isle Marina, located about a half mile up the Noyo River, opened, offering a range of facilities, goods and services to support growing and increasingly diverse commercial and recreational fisheries.

Since those early years, fishery infrastructure in these four North Coast communities has waxed and waned in response to changes in harvest opportunities, processing strategies, and other factors.

Crescent City: The Crescent City Harbor District and approximately 20 businesses at or near the harbor (and more in the larger region) provide considerable infrastructure, goods and services to support local fisheries. Harbor infrastructure includes 15 acres of dock, pier and boat slip facilities, two commercial fish processing facilities (one currently in

operation), several small receiving stations, an ice plant, a fuel dock, a wastewater treatment plant, an indoor vessel repair facility, retail spaces, a storage yard, launch ramps, and equipment such as a Travelift and hoists. Local fish receiving and processing capacity consists of six buyers with receiving stations at the harbor and one on-site receiver/processor, which processes some crab and groundfish on-site; however, most of the unprocessed catch is shipped out of the area. Some buyers and fishermen (through off-the-boat and other direct sales) sell small amounts of crab, groundfish and albacore seasonally.

Trinidad: The Trinidad Pier, owned and operated by the Cher-Ae Heights Indian Community of the Trinidad Rancheria since 2000, is the focal point of local fishing activity. In addition, it serves nonfishing visitors and accommodates Humboldt State University Marine Lab's saltwater intake pipe. The harbor is less developed than larger ports in the region due to its geography. Key fishing infrastructure includes the 540-foot pier, 100 seasonal and about 20 permanent moorings, a launch ramp, parking area and tackle shop. A restaurant at the base of the pier attracts visitors year round. There are no processing, ice-making or cold storage facilities onsite; most of the commercial catch is offloaded by Rancheria staff and distributed outside the community. The pier's fuel dock (which had fallen into disrepair) and fish cleaning station have been removed in recent years due to water quality issues, and the aging pier is slated for reconstruction. Trinidad Pier staff offload the catch on behalf of fish buyers located outside Trinidad. Due in part to the port's isolation and the small number of buyers, many fishermen handle their own (and perhaps others') catch, delivering it to buyers, retailers or restaurants in the region.

Eureka/Fields Landing: Local fish receiving and processing capacity consists of four buyers

with receiving stations located at various sites along the Eureka waterfront, including two on-site receiver/processors. Limited fish receiving occurs at Fields Landing, located about six miles south of Eureka. Commercial and recreational infrastructure consists of several acres of dock/pier offloading and boat slip facilities, as well as storage areas, parking, and service facilities (e.g., launch ramps, fish cleaning station, work docks) located at sites around the bay including Woodley Island Marina, along the city waterfront, and at Fields Landing. The primary berthing facilities are Woodley Island Marina, managed by the Harbor District, and the city-managed Eureka Boat Basin, with limited additional berthing at various docks along the Eureka waterfront, at Fields Landing and at King Salmon. More than 20 Eureka area businesses (and many others outside the area) provide goods and services that directly support both resident and nonresident commercial and recreational fishery operations. Between six and 12 fishermen engage in off-the-boat or other direct sales for albacore, some crab and some other finfish species.

Noyo/Fort Bragg: The Noyo Harbor District, Dolphin Isle Marina and approximately 25 businesses at or near the harbor (and more in the larger region) provide considerable infrastructure, goods and services to support local fishing activities. Harbor infrastructure consists of a 240-slip boat basin with service facilities, a work hoist (fish offloading is prohibited), two launch ramps, a fuel dock, parking and storage areas. Dolphin Isle Marina provides 150 slips, RV spaces, a fuel dock, a café and store, and a fish-cleaning station. Although their number and scope has diminished in recent years, local support businesses provide goods and services from fuel and ice to refrigeration, vessel repair and maintenance, which address many but not all fishery needs. Local fish receiving and processing capacity consists of six buyers

with receiving stations at the harbor, including three on-site receiver/processors and a live-fish buyer. Several fishermen market some of their (and perhaps others') catch directly to retailers and to consumers (e.g., through off-the-boat sales). Because there is no public hoist for offloading fish, some resident buyers also receive fish on behalf of these fishermen as well as other fish buyers.

Commercial Fisheries

Major commercial fisheries on the North Coast include Dungeness crab pot, (non-whiting) groundfish trawl, salmon troll, sablefish hook-and-line/pot, albacore troll, rockfish/lingcod hook-and-line/pot, urchin dive, whiting trawl, and shrimp trawl. Fishing activity has generally declined over the past 27 years (1981–2007). Landings and ex-vessel value peaked at 103.7 million pounds and \$80.4 million, respectively, in 1988. Since 1998, landings and value have been consistently below 45 million pounds and \$50 million, respectively. The number of boats declined precipitously from a peak of 2,550 in 1981 to 500 or fewer boats since 2005. The number of buyers ranged from 73 to 125, with no apparent trend.

From 2003 through 2007, an annual average of 512 boats and 108 buyers participated in North Coast commercial fisheries; landings totaled 37.6 million pounds with an ex-vessel value of \$39.4 million. The top three fisheries in terms of landings were crab pot (which accounted for 37% of all landings), groundfish trawl (24%), and shrimp trawl (21%). The top three in terms of ex-vessel value were crab pot (64%), groundfish trawl (13%), and salmon troll (10%). The top fisheries in terms of vessel participation were crab pot (50%), salmon troll (45%), and rockfish and sablefish hook-and-line (15% and 14% respectively), while the top three in terms of buyers were crab pot (54%), salmon troll (44%) and rockfish hook-and-line/pot (31%). In recent years, the crab fishery

has been the mainstay of the North Coast commercial fishery. In 2003, 2004 and 2006, crab landings ranged from 8.4 to 11.9 million pounds, levels exceeded only once since 1947 (in 1982, when 54.4 million pounds were landed).

Average annual landings, ex-vessel value and vessel participation in North Coast fisheries were 35%, 14% and 52% lower in *recent years* (2003–2007) relative to the *long term* (1981–2007). The direction and size of changes in these variables vary widely across fisheries, with individual variables sometimes changing in opposite directions for a given fishery. For instance, crab pot landings and value increased by 74% and 59% respectively, while participation declined by 31%. Sablefish landings decreased by 3%, while value and participation increased by 25% and 43% respectively. Other fisheries (e.g., groundfish trawl, albacore troll, rockfish/lingcod hook-and-line/pot, urchin dive, shrimp trawl) have shown declines in all three variables. Reasons for these changes vary by fishery, and depend on factors such as resource status and availability, regulations, and market conditions.

The salmon and groundfish fisheries, in particular, have undergone profound changes over the past few decades.

- The commercial salmon fishery in the California KMZ (roughly encompassing Humboldt and Del Norte counties) has been sharply curtailed since the mid-1980s, and in the Fort Bragg management area (roughly encompassing Mendocino county) since the early 1990s. Both areas (particularly the KMZ) have been subject to dramatically reduced seasons, including complete closures in some years, that are much shorter than the seasons allowed elsewhere in California or the greater West Coast area. In 2008 and 2009, the commercial salmon fishery was closed

statewide; this unprecedented action was due to concerns regarding Sacramento River fall Chinook.

- The groundfish fishery (most notably groundfish trawlers and rockfish hook-and-line/pot vessels) also has been subject to increasingly restrictive regulations, particularly since the late 1990s, when eight groundfish stocks were declared overfished. Unprecedented harvest limits, as well as a complex array of other regulations, have been implemented to rebuild overfished stocks. These restrictions, together with the 2003 federal groundfish trawl buyback and the state's implementation of restricted access in the Nearshore Fishery, have significantly reduced participation in the commercial groundfish fishery.

Crescent City: Of the estimated 100 vessels based at the port, 85–90 are crabber/trollers, 12 are nearshore operations, and five are groundfish/shrimp trawlers. Most fishermen participate in multiple fisheries; more than 75% participate in the crab fishery. Of the 157 boats that landed at Crescent City in 2007, an estimated 37 (about 24%) were nonresident vessels from Oregon and Washington as well as other California ports.

Relative to the *long term* (1981–2007), average annual total fishing activity has decreased in *recent years* (2003–2007) in terms of landings (-44%), ex-vessel value (-4%), boats (-57%), trips (-48%) and buyers (-15%).

Trinidad: Approximately 17 commercial fishing operations, each employing a skipper and a crew of two (in most cases), are based at Trinidad Harbor.

Relative to the *long term* (1981–2007), average annual fishing activity has increased in *recent years* (2003–2007) in terms of landings (+58%), ex-vessel value (+42%) and buyers

(+36%), and decreased in terms of boats (-62%) and trips (-32%).

Eureka/Fields Landing: About 100–120 commercial fishing vessels are homeported at Eureka. The resident fleet includes eight to ten trawlers, 15–20 salmon trollers, five to ten smaller groundfish vessels (sablefish and nearshore species), and about 80 crabbers (including some crabber/trollers).

Relative to the *long term* (1981–2007), average annual fishing activity in the Eureka area (Eureka and Fields Landing combined) has declined in *recent years* (2003–2007) in terms of landings (-14%), ex-vessel value (-13%), boats (-50%), buyers (-2%) and trips (-45%).

Noyo/Fort Bragg: Approximately 60–80 commercial fishing vessels are homeported at Noyo Harbor, including seven trawlers, 30–40 salmon trollers, 15–20 multi-fishery vessels, and about 10–15 urchin dive boats. Although some fishermen in these groups are specialized, most participate in multiple fisheries.

Noyo also is a port of call (and refuge) for nonresident fishing vessels, especially salmon trollers.

Relative to the *long term* (1981–2007), average annual total fishing activity has decreased in *recent years* (2003–2007) in terms of landings (-52%), ex-vessel value (-31%), boats (-44%) and trips (-54%), while buyers have increased (+15%).

Recreational Fisheries

Recreational fisheries on the North Coast include salmon, groundfish, albacore, halibut, abalone, and crab. According to the CRFS (which provides district-level estimates of recreational effort and harvest), an annual average of 216,000 angler trips were taken on the North Coast between 2005 and 2007 – 143,000 in the ‘Redwood District’ (roughly

encompassing Humboldt and Del Norte counties) and 73,000 in the ‘Wine District’ (roughly encompassing Mendocino County). About 26% of these trips were made from manmade structures, 29% from beach/bank, 9% from CPFVs, and 36% from private/rental boats.

Salmon and groundfish, which traditionally have been the major target species for CPFV and private boat anglers, have become much less available for harvest in recent decades. Community members view groundfish as a second choice to, but not a substitute for, salmon. Some North Coast anglers also participate in the winter crab fishery.

Recreational salmon regulations for the North Coast differentiate between California’s KMZ (Humboldt and Del Norte counties, including Crescent City, Trinidad and Eureka/Fields Landing) and Fort Bragg, with regulations generally much more stringent in the KMZ. Regulatory changes for salmon and groundfish are as follows:

- Salmon fishing opportunities have been constrained by concerns regarding Klamath River fall Chinook and (more recently) Sacramento River fall Chinook. The decline in recreational salmon opportunities experienced since the early 1990s has been largely concentrated in California’s KMZ. The KMZ season was reduced from about nine months in the early 1980s to four to six months in the mid-1980s to zero to four months since the early 1990s, with associated decreases in fishing effort. The Fort Bragg management area was generally much less constrained than the KMZ fishery and experienced a general increase in effort during the period 1992–2007; some of this increase may be due to diversion of previous KMZ effort to Fort Bragg. In 2008, however, major concerns regarding the status of Sacramento River

fall Chinook resulted in a dramatic and unprecedented shortening of recreational seasons statewide. The recreational season in California's KMZ was zero days in 2008 and ten days in 2009. The Fort Bragg recreational season was 45 days in 2008 (significantly reduced from its normal eight to nine months) and zero days in 2009. While such severe restrictions were not new for the KMZ, they were unprecedented for the Fort Bragg area.

- The recreational groundfish fishery has been subject to more stringent management since the late 1990s to address rebuilding requirements for overfished rockfishes. Management actions have included reductions in rockfish and lingcod bag limits, rockfish sublimits, reductions in season length from 12 months to three to four months, and depth-based closures.

Information on port-specific recreational activity is provided here, based on California Department of Fish and Game (CDFG) CPFV logbook data and fieldwork conducted for this project. The logbook data are used to compare charter boat effort in *recent years* (2003–2007) with effort over the *long term* (1980–2007), while fieldwork is the basis for information regarding current charter and private boat activity, as available. The logbook data should be interpreted with caution, as compliance with the logbook requirement may be uneven across years and ports.

Crescent City: CPFV logbook data cannot be reported for 2003–2007, due to the small number of operators involved. Results of fieldwork indicate that one to two CPFVs currently operate at the port.

Eureka/Fields Landing: CPFV logbook data cannot be reported for 2003–2007, due to the small number of operators involved. Based on fieldwork results, three resident charter boats

currently operate in Eureka proper, and several others move between Trinidad and Eureka.

Trinidad: According to CPFV logbooks, annual charter activity in Trinidad from 2003 through 2007 averaged five boats, 354 boat trips, and 1,914 angler trips. The average number of boats, boat trips and angler trips in recent years are 73%, 100% and 90% higher (respectively) relative to the long-term average. Trinidad currently has six charter operations – five 'six-packs' (smaller (25- to 38-foot) vessels that carry a maximum of six fishing passengers, and one 44-footer that carries up to 12 passengers. Four of these operations also participate in the winter commercial crab fishery. In addition, most also offer scenic viewing (including whale-watching) trips. Private boat activity has declined in Trinidad, as indicated by reduced use of seasonal moorings (from about 400 to 90) and reduced launch ramp use (from 45 to 60 launches per day to 10 to 30 in recent years).

Noyo/Fort Bragg: According to CPFV logbooks, annual charter activity in Fort Bragg from 2003 through 2007 averaged eight boats, 653 boat trips, and 12,514 angler trips. The number of boats is unchanged relative to the long-term average, while boat trips are 54% higher and angler trips are 44% higher. Noyo currently has five active charter operations, which carry between 6 and 40 passengers.

CDFG's Ocean Salmon Project provides area-specific information on recreational salmon effort (including the Crescent City, Eureka and Fort Bragg areas). While estimates for the Crescent City area pertain only to the port of Crescent City, the Eureka and Fort Bragg area estimates include multiple ports. The Eureka area estimates include Eureka/Fields Landing and Trinidad.

Crescent City: The number of salmon angler trips in Crescent City averaged 2,300 from 2003 through 2007, 86% lower than the

average of 16,422 angler trips for the period 1981–2007. CPFV trips accounted for 1%–2% of salmon effort over the long term and in recent years.

Eureka area (including Eureka, Fields Landing and Trinidad): The number of salmon angler trips averaged 16,820 per year from 2003 through 2007, 18% lower than the average of 20,574 angler trips for the period 1981–2007. CPFV trips accounted for 7%–8% of salmon effort both over the long term and in recent years.

Fort Bragg area (including Noyo and other, smaller nearby ports): The number of salmon angler trips increased by 26% from an annual average of 18,578 from 1981 through 2007 to 23,320 from 2003 through 2007. CPFV trips accounted for 25% of salmon effort over the long term, relative to 34% in recent years.

Current Situation and Outlook

North Coast commercial and recreational fisheries have changed markedly over the past three decades. Expansion through the 1970s and early 1980s was followed by contraction as regulatory, economic and other factors played out during the 1990s and into the 2000s. Reduced fishing opportunities have increased economic stress and uncertainty for fishery participants, support businesses and the larger community.

Study participants identified a number of issues and challenges facing their communities. Some of these issues were common across ports:

- Dramatic reductions in major North Coast fisheries – most notably groundfish and salmon – are of great concern to community members. Many study participants expressed concern about the vulnerability of local infrastructure to further declines, noting that the viability of local fisheries and the fishing community

depends on a certain level and diversity of activity. Without access to these and other fundamental services, continuing to fish may become untenable.

- The commercial sector’s primary dependence on a single fishery (crab) and the recreational sector’s limited fishing opportunities make both sectors potentially vulnerable to changing resource, regulatory and market conditions.
- Commercial fishery participants and support businesses cited rising operating costs, especially those for gear, vessel maintenance, insurance and fuel, as among the biggest challenges they are facing. At the same time, many commercial fishermen commented on stagnant or declining prices in several fisheries. Increasing costs and less favorable economic conditions also have affected fishery-support businesses, both directly and indirectly. The reduction in fishing opportunities and activity has resulted in the loss of fish houses (vertically integrated buyers capable of processing fish from multiple operations) in several ports and reduced demand for goods and services that these businesses provide.
- Study participants are concerned about recent and pending events in the larger policy arena including the North Coast Marine Life Protection Act process, begun in late 2009, the individual quota program for the federal groundfish trawl fishery, to be implemented in 2011, and potential offshore energy development. All of these have the potential to fundamentally change local fisheries and the communities.

Interviews with study participants also yielded information on issues and events specific to each community, which present challenges but also provide reasons for their continued resilience to change.

Crescent City: The decline in fishing activity at Crescent City over the last 30 years has reduced shoreside activity, leading businesses to close, reduce services and/or inventory, or diversify their operations. With limited alternative sources of revenue, harbor infrastructure has deteriorated. Insufficient provision for basic maintenance and repair of docks and related infrastructure has led to their disrepair and vulnerability to events such as the 2006 tsunami. These and other costs, particularly for dredging and dredge material disposal, and maintaining and operating the wastewater treatment plant, have become significant.

Local processing of seafood is limited, due in part to the high cost of using the harbor's wastewater treatment plant, which is required for fish processing. This factor contributed to the closure of two local processing facilities in the past decade, and has continued to be an issue for current and prospective processors. The reduction in landings in key fisheries coupled with increasing transportation costs have led to regional consolidation of processing facilities. Finally, Crescent City's small local population, many of whom fish recreationally for their own catch, creates limited demand for local processing and seafood retail.

The Crescent City community has a well-established history of adapting to change that may enable it to meet these challenges. Community members have a history of working together to support the harbor and its fisheries. Recently, funds were secured to begin much-needed dredging of the harbor's main navigation channel, and additional funds to support reconstruction of the inner basin and other improvements are pending. These efforts together with the port's location near rich fishing grounds, its safe and easy access, and the availability of key services, create the potential for Crescent City to regain its resilience and vitality as a fishing port.

Trinidad: In 1974, the State designated the Trinidad Kelp Beds an Area of Special Biological Significance (ASBS); in 2002, it was classified as a state Critical Coastal Area (CCA). Since acquiring the pier and associated infrastructure in 2000, Trinidad Rancheria has taken several actions to meet the site's particularly high water quality standards while addressing the needs of the fishing community, which depends on safe, functional infrastructure. The Trinidad Harbor fishing community continues to adjust to changes in fishing opportunities, as well as requirements stemming from the area's designation as an ASBS/CCA. The Rancheria is actively pursuing funding to replace the pier; however, securing full funding for the \$8-million project has been difficult, given these factors and the current economic climate.

Nonetheless, the Trinidad Harbor fishing community is well positioned to address these challenges. As a natural harbor with modest infrastructure (pier, launch ramp and moorings only), there are no navigation channels or slips to be maintained. The Rancheria has more operational flexibility than most publicly managed facilities, and has successfully collaborated with the City of Trinidad and others to obtain partial funding for the much-needed reconstruction of the pier. The fishing community is a small but substantially integrated group, and most individuals recognize that their respective needs are interdependent. These features lend the Trinidad Harbor fishing community a degree of resilience that may enable it to effectively address the challenges and opportunities that lie ahead.

Eureka/Fields Landing: Aging infrastructure, the closure of support businesses such as Eureka Fisheries in 2000 and Eureka Ice and Cold Storage in 2008, and increasingly expensive real estate prices and permitting requirements for maintaining and developing Eureka's working waterfront, have complicated efforts by fishermen and others to maintain viable operations.

Receiving and processing capacity has contracted geographically and become consolidated. Where multiple providers of goods and services (e.g., marine supply, fuel dock, vessel maintenance and repair) once were needed to meet local demand, only one or two of each type remain, serving communities elsewhere along the North Coast as well as Eureka. While this consolidation suggests increased efficiency, the limited number of goods and service providers makes the local fishing community vulnerable to further regulatory, economic and environmental change.

The development of the Fishermen's Terminal along a stretch of city waterfront formerly occupied by fish houses addresses some basic infrastructure needs for local commercial fisheries. Conceived in the early 1980s by local fishermen and the city, the project faced spiraling costs and other challenges. However, in 2006 the first phase of the project was completed (providing dock space and hoists), and in late 2009 the city received federal stimulus funds to help with completion of the project. The Fishermen's Terminal will provide a fish offloading area, seafood market and café, as well as receiving and processing space for two businesses.

The Eureka fishing community is strengthened by the political will of its citizens and leaders, and existing and future infrastructure assets such as two well-maintained harbors, a boatyard and

fuel station, and the developing Fishermen's Terminal. These features lend the Eureka fishing community a degree of resilience that may enable it to effectively address the challenges and opportunities ahead.

Noyo/Fort Bragg: As fishing activity has declined over the last 30 years, so has the Noyo Harbor District's revenue base, making it difficult to maintain and improve infrastructure, while costs, particularly for dredging and dredge material disposal, have become significant both for the harbor district, and Dolphin Isle Marina. Use of other infrastructure, including receiving stations, fuel docks and the ice plant, which are privately owned, has declined as well, leading to reductions in the number and types of support businesses. With only a core group of support businesses remaining, fishery participants are concerned about the potential for further loss of infrastructure, and its implications for the viability of local fisheries and the fishing community. The need for dredging is acute for fishermen and others who depend on Noyo for provisions, services and refuge from often dangerous ocean conditions along this isolated stretch of the North Coast.

While these issues pose serious challenges to the viability of the Noyo fishing community, they have also motivated individuals, families and businesses to identify opportunities for sustaining their livelihoods and heritage.

Regional Profile



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EXECUTIVE SUMMARY

National Standard 8 of the Magnuson-Stevens Fishery Conservation and Management Act requires that fishery managers consider the importance of fishery resources to fishing communities, to provide for their sustained participation and to minimize adverse economic impacts on them, consistent with conservation objectives. Similarly, California's Marine Life Management Act (MLMA) mandates the use of socioeconomic as well as biophysical Essential Fishery Information to meet fishery management goals. Information on how individual fisheries and port communities operate is important to meeting these mandates. Yet, in-depth social science information on California fishing communities remains quite sparse.

The purpose of the Fishing Communities Project was to provide detailed historical and current social science information on four Northern California port communities – Crescent City, Trinidad, Eureka/Fields Landing, and Noyo/Fort Bragg. In addition to profiling each community, the project also provides a regional overview that encompasses the three counties – Mendocino, Humboldt, and Del Norte – in which these communities are situated.

This Regional Profile provides county-level demographic and economic information, a discussion of fishery regulations, and customized summaries of ocean commercial and recreational fishery data for the three North Coast counties and the tri-county region. The information provided here is based on the collection and integrated analysis of archival data to interpret patterns, variability and change within and across fisheries and the fishing community over time. Data sources include:

- PacFIN commercial fish landing receipt data for the period 1981–2007 reconfigured into 34 distinct species/gear combinations;
- Commercial Passenger Fishing Vessel (CPFV) logbook data for the period 1980–2007;
- An extensive review of the published and gray literature, including fishery status reports and historical fishery statistics (as available) from the Pacific Fishery Management Council (PFMC), National Marine Fisheries Service (NMFS), and California Department of Fish and Game (CDFG); and
- Statistics from government sources such as the U.S. Census Bureau, the Economic Research Service, the Bureau of Economic Analysis, and the Bureau of Labor Statistics.

Demographic and Economic Overview

The three North Coast counties are rural and sparsely populated – a marked contrast to the highly urban nature of other coastal counties in California. Relative to California as a whole, the North Coast population is generally older, more limited in terms of income and education, and less racially diverse. Unemployment rates historically have been much higher in these counties than the state, although that gap narrowed considerably by 2009 due to statewide increases in unemployment associated with the current recession. In 2007, private sector business activity in North Coast counties involved 6,884 establishments (employing 67,326 people) and an additional 20,935 self-employed individuals. Private sector establishments with employees are most likely to be involved in construction, manufacturing, retail trade, health care/social assistance, and accommodation/food services. Self-employed individuals are most likely to be involved in construction, retail trade, real estate/rental and leasing, professional/scientific/

technical services, and health care/social assistance. Earnings in the three counties totaled \$5.7 billion in 2007: 16% in proprietors' income, 61% in private earnings, and 23% in government earnings.

Commercial Fisheries

Major commercial fisheries on the North Coast include Dungeness crab pot, nonwhiting groundfish trawl, salmon troll, sablefish hook-and-line/pot, albacore troll, rockfish/lingcod hook-and-line/pot, urchin dive, whiting trawl, and shrimp trawl.¹ Fishing activity has generally declined over the past 27 years (1981–2007). Landings and ex-vessel value peaked at 103.7 million pounds and \$80.4 million respectively in 1988. Since 1998, landings and value have been consistently below 45 million pounds and \$50 million, respectively. The number of boats declined precipitously from a peak of 2,550 in 1981 to 500 or fewer boats since 2005. The number of buyers ranged from 73 to 125, with no apparent trend.

From 2003 through 2007, an annual average of 512 boats and 108 buyers participated in North Coast commercial fisheries; landings totaled 37.6 million pounds with an ex-vessel value of \$39.4 million. The top three fisheries in terms of landings (and the proportion of North Coast landings they accounted for) were: crab pot (37%), groundfish trawl (24%), and shrimp trawl (21%). The top three in terms of ex-vessel value were crab pot (64%), groundfish trawl (13%), and salmon troll (10%). The top fisheries in terms of vessel participation were crab pot (50%), salmon troll (45%), and rockfish and sablefish hook-and-line (15% and 14% respectively), while the top three in terms of buyers were crab pot (54%), salmon troll (44%) and rockfish hook-and-line/pot (31%).² In recent years, the crab fishery has been the mainstay of the North Coast commercial fishery. In 2003, 2004 and 2006, crab landings ranged from 8.4 to 11.9 million pounds, levels exceeded only once since 1947 (in 1982, when 54.4 million pounds were landed).

Average annual landings, ex-vessel value and vessel participation in North Coast fisheries were 35%, 14% and 52% lower during recent years (2003–2007) relative to the long term (1981–2007). The direction and size of changes in these variables vary widely across fisheries, with individual variables sometimes changing in opposite directions for a given fishery. For instance, crab pot landings and value increased by 74% and 59% respectively, while participation declined by 31%. Sablefish landings decreased by 3%, while value and participation increased by 25% and 43% respectively. Other fisheries (e.g., groundfish trawl, albacore troll, rockfish/lingcod hook-and-line/pot, urchin dive, shrimp trawl) have shown declines on all three measures. Reasons for these changes vary by fishery, and are related to factors such as resource status and availability, regulations, and market conditions.

The salmon and groundfish fisheries have undergone profound changes over the past few decades.

- The commercial salmon fishery in California's Klamath Management Zone (KMZ, roughly encompassing Humboldt and Del Norte counties) has been sharply curtailed since the mid-1980s, and in the Fort Bragg management area (roughly encompassing Mendocino county) since the early 1990s. Both areas (particularly the KMZ) have been subject to dramatically reduced seasons – including complete closures in some years – that are much shorter than the seasons allowed elsewhere in California or even the West Coast. In 2008 and 2009, the commercial salmon fishery was closed statewide; this unprecedented action was due to concerns regarding Sacramento River fall Chinook.

- The groundfish fishery (most notably groundfish trawlers and rockfish hook-and-line/pot vessels) has also been subject to increasingly restrictive regulations, particularly since the late 1990s when eight groundfish stocks were declared overfished. Unprecedented harvest limits, as well a complex array of other regulations, have been implemented to rebuild overfished stocks and address overcapacity in the groundfish trawl sector.

Recreational Fisheries

Recreational fisheries on the North Coast include salmon, groundfish, albacore, halibut, abalone, and crab. An annual average of 216,000 angler trips were taken on the North Coast from 2005 through 2007: 26% from manmade structures, 29% from beach/bank, 9% from CPFVs, and 36% from private/rental boats.

Salmon and groundfish, which traditionally have been the major target species for CPFVs and private boat anglers, have become less available for harvest in recent decades – largely due to concerns regarding Klamath River fall Chinook and (more recently) Sacramento River fall Chinook, and rebuilding requirements for overfished rockfishes (which include a number of recreationally important species).

- The decline in recreational salmon opportunities experienced since the early 1990s has been largely concentrated in California’s KMZ. The KMZ season was reduced from about nine months in the early 1980s to four to six months in the mid-1980s to zero to four months since the early 1990s, with associated decreases in fishing effort.
- The Fort Bragg management area was generally much less constrained than the KMZ fishery and experienced a general increase in effort during the period 1992–2007; some of this increase may be due to diversion of previous KMZ effort to Fort Bragg.
- In 2008, however, major concerns regarding the status of Sacramento River fall Chinook resulted in a dramatic and unprecedented shortening of recreational seasons statewide. The recreational season in California’s KMZ was zero days in 2008 and ten days in 2009. The Fort Bragg recreational season was 45 days in 2008 (significantly reduced from its normal eight to nine months) and zero days in 2009. While such severe restrictions were not new for the KMZ, they were unprecedented for the Fort Bragg area.
- Like the commercial fishery, the recreational groundfish fishery has been subject to more stringent management since the late 1990s, with management actions including reductions in rockfish and lingcod bag limits, rockfish sublimits, reductions in season length from 12 months to three to four months, and depth-based closures.

Summary

Over the past three decades, North Coast commercial and recreational fisheries have changed markedly, undergoing expansion through the early 1980s, followed by contraction as regulatory, economic and other factors played out during the 1990s and into the 2000s. Reduced fishing opportunities have increased economic stress and uncertainty for fishery participants, support businesses and the larger community. In the face of such constraints, North Coast communities are confronted with the challenge of maintaining the viability of their fisheries. Decisions and plans are being made at the community level regarding infrastructure and other issues to help address this challenge. These adaptations, which are specific to each community, are discussed in the individual port profiles.

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INTRODUCTION

The port communities that are the focus of this project are located in three counties: Mendocino County (Noyo/Fort Bragg), Humboldt County (Eureka/Fields Landing and Trinidad) and Del Norte County (Crescent City). The geographic scope of this regional overview encompasses those three counties, with an emphasis on ocean commercial and recreational fisheries.³ Use of county boundaries was deemed appropriate and useful, as demographic and economic statistics of various types are readily available at the county level, and management boundaries for some major North Coast fisheries coincide approximately with county boundaries.

This Regional Profile provides county-level demographic and economic information, a discussion of fishery regulations, and customized summaries of ocean commercial and recreational fishery data for the three North Coast counties and the tri-county region. The purpose of this overview is to characterize regional fishing activity as well as provide a larger context for the fisheries depicted in the individual port profiles. The demographic and economic data provided here are indicative of the larger context within which North Coast fishing communities operate and adapt to change, and are also suggestive of how life in rural areas contrasts with the largely urban environment in which most Californians live.

The regional and port profiles reflect, respectively, regionally and locally relevant activities and influences. In situations where a factor (e.g., fishery regulations, market influences) is common to the region and/or to multiple ports, that factor is discussed in those profiles for which it is relevant. While this introduces some redundancy among profiles in terms of the information provided, it also allows this Regional Profile and each port profile to be read and used as a stand-alone document.

SOCIAL AND ECONOMIC BACKGROUND

Early History of the Region

The North Coast region of California encompasses the ports of Fort Bragg, Eureka/Fields Landing, Trinidad, and Crescent City (Figure 1). Separated from the interior by rugged mountains of the Klamath and North Coast ranges, this region's coastal communities historically have been, and still very much are, resource-dependent. Since the early 19th century, agriculture, logging and manufacturing of timber, along with fishing (sport and commercial), have been the basis for social and economic growth and well-being.



Figure 1. Map of the North Coast of California, showing ports and counties of interest.

For at least 2,000 years before European explorers discovered America, native peoples inhabited the North Coast. Given the incredible wealth of land and water resources, several tribes subsisted and formed their cultures around native plants and animals. Probably the most important of these is the Chinook salmon, which formed the basis of most tribal diets. Several different tribes, from the Pomo Indians of the Mendocino coastal region, the Wiyot and Mattole in the Humboldt Bay area, to the Yurok and Tolowa peoples in the Klamath River/Crescent City area, established communities and relationships with others and the land.

Monumental changes occurred along the North Coast region in the 1850s, as the developing gold mining and timber industries brought thousands of settlers to the area. Crescent City and Trinidad were settled in the early 1850s following the discovery of gold on the Klamath, Trinity and Salmon rivers. The first official town in Humboldt County, Trinidad was the county seat from 1852 to 1854, and connected people and supplies to gold mining operations inland. The center of activity soon shifted to Humboldt Bay and the cities of Eureka and Arcata, where three European-American exploration groups – the Laura Virginia party, the Union Company, and

the Mendocino Company – had laid claim to Humboldt Bay and its surrounding lands (Glatzel 1982). Eureka became the shipping center for the region, serving gold mining and timber harvesting interests in Trinity and Siskiyou counties (Monroe et al. 1973). In the Fort Bragg area, the first sawmill on California’s North Coast was built at the mouth of the Noyo River in 1852 (McEvoy 1986). During this time of intense settlement in the North Coast region, many native peoples were forced off their land. The U.S. Government negotiated with many tribes to establish Indian lands and reservations and quell the violence between settlers and Indians. By the late 1800s, very few Indians remained on their native lands along the coast.

River fisheries for coho (*Oncorhynchus kisutch*) and Chinook salmon (*O. tshawytscha*), along with cannery operations, began in the mid-1800s. The advent of motorized trollers allowed the ocean salmon fishing industry to expand from the Monterey Bay area to the North Coast during the 1920s (Feinberg and Morgan 1980). Groundfish trawlers also became active along the North Coast and specifically in the Eureka area by 1929, where they delivered their catch for shipment to larger population centers by rail (Scofield 1954). Also around that time several seafood companies (many of which originated in San Francisco) began doing business with fishermen along the North Coast. The onset of WWII led to dramatically increased catches of groundfish, particularly Dover sole, which was purchased in large quantities by the U.S. Government to feed soldiers overseas (Hagerman 1952). A lucrative fishery developed for shark livers around this time, but was short-lived.

By the 1960s, with an estimated 90% of the redwoods gone (Norman et al. 2007), fisheries became increasingly important to these communities. Expanding activity in the commercial salmon, crab and groundfish fisheries, as well as the growth of the sportfishing fleet created the need for an adequate harbor and berthing facilities at each port. Dredging and other breakwater construction projects by the Army Corps of Engineers, and various city and county agency efforts, improved harbor access and navigability. Various federal programs further encouraged the development of the nation’s fisheries. For example, the 1971 reauthorization of the Farm Credit Act enabled commercial fishermen to obtain loans through local Production Credit Associations, which had been making such loans to farmers and ranchers since 1933 (Dewees 1976, NOAA 1999). Additionally, the Capital Construction Fund and Fishing Vessel Obligation Guarantee program (authorized by the Federal Ship Financing Act of 1972) offered low interest or government-backed loans, tax-deferred vessel repair and construction programs, fuel tax relief, gear replacement funds, market expansion programs and technical assistance (NOAA 1999). These opportunities helped to substantially increase fleet size and capacity. The passage of the federal Fishery Conservation and Management Act (later the MSA) in 1976, called for the development of U.S. fisheries as well as their management. As in many other places in the United States, the 1970s and 1980s were the boom years for the North Coast fisheries.

Historical Fisheries Data

Historic data on landings and landed value compiled from California Fish and Game Bulletins⁴ provide insights into the nature and extent of commercial fishing activity on the North Coast since 1947. Groundfish, salmon and crab together comprised roughly 80% of average annual landings from 1947 through 1980 and average annual ex-vessel value from 1947 through 1980 and 1981 through 2007, and 63% of average annual landings from 1981 through 2007 (Table 1). The relative contribution of groundfish and crab to total landed value increased between 1947–

1980 and 1981–2007, while the salmon contribution decreased. Albacore was also harvested in the 1940s and thereafter, and shrimp since the early 1950s, though in smaller quantities than groundfish, salmon or crab.

Table 1. Average annual landings (pounds, in millions) and ex-vessel value (2007\$, in millions) of major North Coast species, 1947–1980 and 1981–2007 (CDFG Fish Bulletin Series).

	Groundfish	Salmon	Crab	Subtotal	Total
Average Landings: million pounds (% of total)					
1947–1980	24.0 (54%)	3.8 (9%)	8.3 (19%)	36.1 (82%)	44.7 (100%)
1981–2007	25.9 (46%)	1.2 (2%)	8.2 (15%)	35.3 (63%)	55.8 (100%)
Average Ex-Vessel Value: million \$ (% of total)					
1947–1980	8.3 (27%)	9.8 (32%)	7.2 (24%)	25.3 (83%)	30.4 (100%)
1981–2007	14.8 (33%)	4.5 (10%)	15.8 (36%)	35.1 (79%)	44.2 (100%)

Landings increased from 1947 through the 1980s, peaking in 1977 (88.7 million pounds) and 1988 (96.2 million pounds; Figure 2). Landings subsequently declined to a low of 26.6 million pounds in 2005. This low was rivaled only by 1953 and 1955 landings (25.7 million and 24.1 million pounds, respectively). Groundfish landings peaked at 54.4 million pounds in 1982 and reached their lowest levels (8.4–11.9 million pounds) during the period 2001–2007. Salmon landings peaked at 6.4 million pounds in 1966 and fell below one million pounds in 1984, and during the periods 1990–2001 and 2005–2007. Crab landings during 2003, 2004 and 2006 ranged from 7.5 to 20.2 million pounds, levels exceeded only by the 33.5 million pounds landed in 1977.

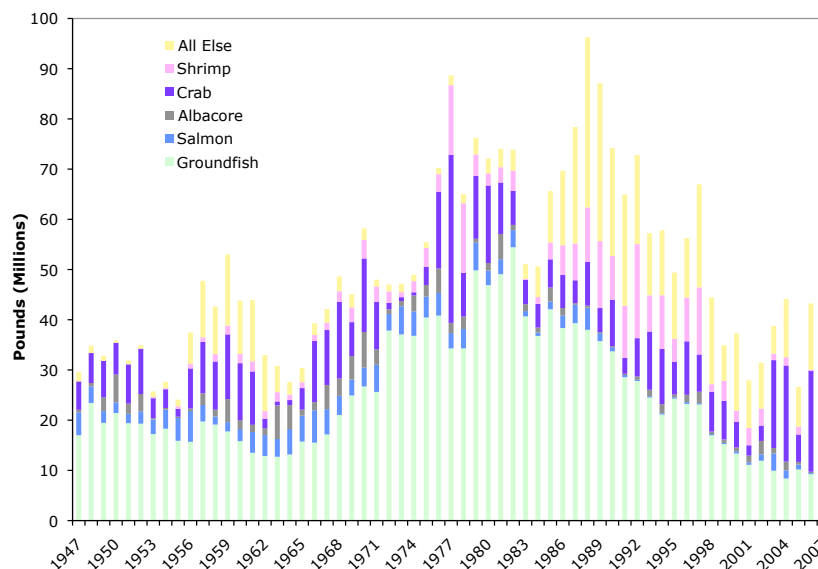


Figure 2. North Coast commercial fishery landings, 1947–2007 (CDFG Fish Bulletin Series).

The ex-vessel value of landings peaked in 1976 (\$74.9 million) and 1988 (\$75.8 million; Figure 3). Landed value subsequently declined to lows of \$21–\$23 million in 2001, 2002 and 2005. Values lower than \$23 million had not been previously experienced except in seven of the 12 years from 1947 to 1958. The ex-vessel value of groundfish was less than \$6 million from 1955 through 1956, 1959 through 1962, 1964 through 1965 and 2004, and exceeded \$20 million in 1981, 1982, 1987, 1988 and 1995. Salmon landed value reached a low of \$46,000 in 1992 and exceeded \$15 million in 1966, 1973, 1982, 1987 and 1988. Crab landed value was less than \$2 million in 1955, 1963, 1964, 1973 and 1974, and exceeded \$30 million in 2003, 2004 and 2006.

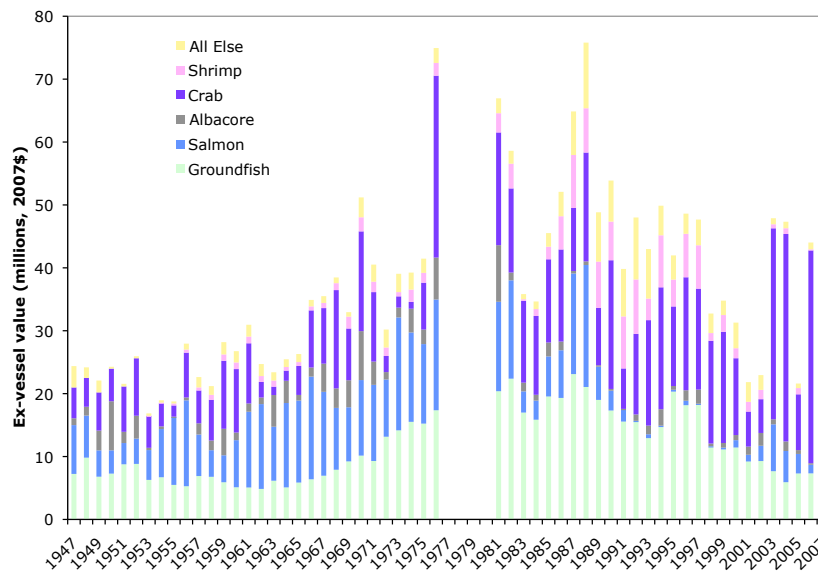


Figure 3. Ex-vessel value (2007\$) of North Coast commercial fisheries, 1947–2007 (CDFG Fish Bulletin Series). Note: Ex-vessel value data for 1977–1980 are not available.

Population and Demographics

Rural-Urban Designation

The three North Coast counties are rural and sparsely populated. According to the rural-urban classification system developed by the Economic Research Service, (Table 2), Mendocino County is categorized as a 4 (nonmetro county with urban population of 20,000 or more, adjacent to a metro area), Humboldt County as a 5 (nonmetro county with urban population of 20,000 or more, not adjacent to a metro area), and Del Norte County as a 7 (nonmetro county with urban population of 2,500–19,999, not adjacent to a metro area). Although population in-migration caused Mendocino County’s status to change between 1983 and 1993, the status of the other two counties has not changed over the past two decades. These counties are a stark contrast to the urban nature of other coastal counties in California. San Luis Obispo County is the next most rural coastal county (urban/rural continuum code=3); all other coastal counties are classified 1 or 2.

Table 2. North Coast counties classified by rural-urban continuum code (U.S. Department of Agriculture, Economic Research Service).

County	1983	1993	2003
Mendocino	5	4	4
Humboldt	5	5	5
Del Norte	7	7	7

Rural-urban continuum codes:

- 1 = county in metro area with 1 million population or more.
- 2 = county in metro area of 250,000 to 1 million population.
- 3 = county in metro area of fewer than 250,000 population.
- 4 = nonmetro county with urban population of 20,000 or more, adjacent to a metro area.
- 5 = nonmetro county with urban population of 20,000 or more, not adjacent to a metro area.
- 6 = nonmetro county with urban population of 2,500–19,999, adjacent to a metro area.
- 7 = nonmetro county with urban population of 2,500–19,999, not adjacent to a metro area.
- 8 = nonmetro county completely rural or less than 2,500 urban population, adjacent to a metro area.
- 9 = nonmetro county completely rural or less than 2,500 urban population, not adjacent to a metro area.

Population

The combined population of the three counties was 240,258 in 2000, distributed as follows: 36% in Mendocino County, 53% in Humboldt County, and 11% in Del Norte County. Fort Bragg accounted for 8% of the Mendocino population, Eureka for 21% of Humboldt’s population, and Crescent City for 27% of Del Norte’s population. Trinidad (California’s smallest incorporated city) and Fields Landing (an unincorporated area) each accounted for less than 1% of Humboldt County’s population (Table 3).

Table 3. 2000 population of Mendocino, Humboldt and Del Norte counties and selected fishing ports within each county, and port population as percent of associated county population (U.S. Census Bureau).

County/Port	2000 Population	Percent of County Population
Mendocino County	86,389	
Fort Bragg	6,818	7.9%
Humboldt County	126,397	
Eureka	26,069	20.6%
Fields Landing	213	0.2%
Trinidad	315	0.2%
Del Norte County	27,472	
Crescent City	7,528	27.4%

Since 1981, population growth has generally been lower in the North Coast counties than the state as a whole (Table 4). Exceptions to this trend are the unusual population increases in Del Norte County from 1981 through 1990 and 2001 through 2009. One factor contributing to its 1981–1990 growth rate was the establishment of Pelican Bay State Prison near Crescent City in 1989. The prison currently houses about 3,300 inmates.

Table 4. Population of Mendocino, Humboldt, Del Norte counties and California in 1981 and 2009, and percent change in population, 1981–1990, 1991–2000, and 2001–2009 (U.S. Census Bureau).

Location	Population		Population Change		
	1981	2009	1981–1990	1991–2000	2001–2009
Mendocino	68,385	88,040	18.2%	5.9%	1.6%
Humboldt	110,338	129,623	8.4%	4.8%	2.0%
Del Norte	18,789	29,623	27.6%	6.3%	8.3%
California	24,285,933	36,961,664	23.3%	11.8%	7.1%

Age

The North Coast population tends to be older than California’s population as a whole (Figure 4). In 2008, individuals under 18 years old comprised 20%–22% of the population in each North Coast county, compared to 26% of the California population. At the other end of the age spectrum, 13%–15% of the county populations were greater than 65 years old, compared to 11% of California’s population.

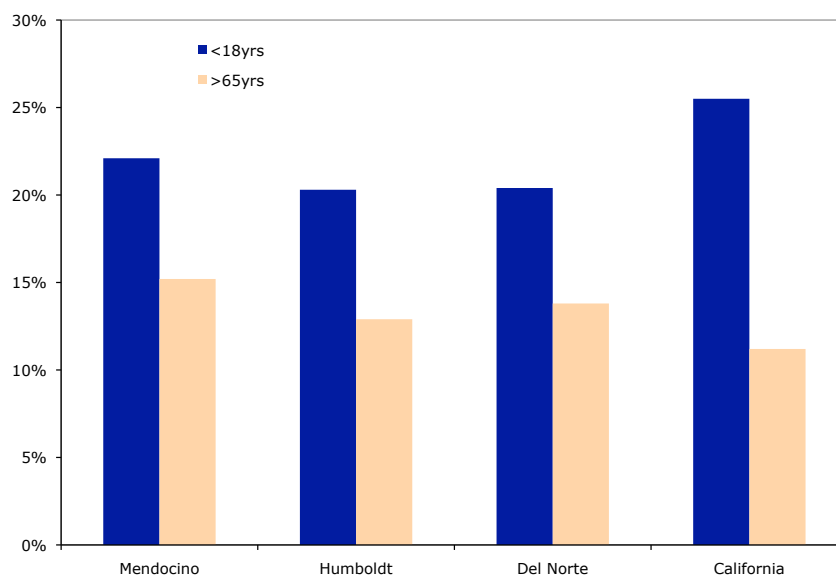


Figure 4. Percent of population < 18 years and > 65 years in Mendocino, Humboldt and Del Norte counties and statewide, 2008 (U.S. Census Bureau, State and County Quick Facts).

Education

In 2000, the proportion of the population age 25 and older whose maximum education was a high school degree was 81% in Mendocino County, 85% in Humboldt County and 72% in Del Norte County, compared to 77% statewide (Figure 5). The proportion whose maximum education was a bachelor’s degree was lower in these counties (20%, 23% and 11%, respectively) than for California as a whole (27%).

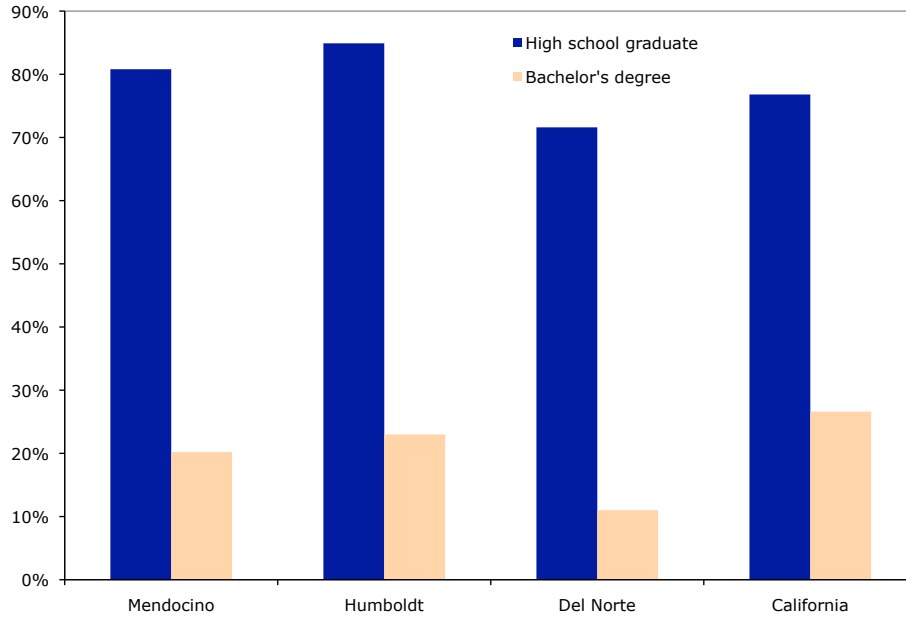


Figure 5. Percent of population 25+ years in Mendocino, Humboldt and Del Norte counties and statewide with maximum education attainment of high school degree and bachelor's degree, 2000 (U.S. Census Bureau, State and County Quick Facts).

Income

Median household income in 2008 was considerably lower in Mendocino (\$43,100), Humboldt (\$39,600) and Del Norte counties (\$36,000) than in California as a whole (\$61,000; Figure 6). The proportion of the population below the poverty level in 2008 was also higher in these counties (18%, 20% and 24%, respectively) than the state as a whole (13%; Figure 7).

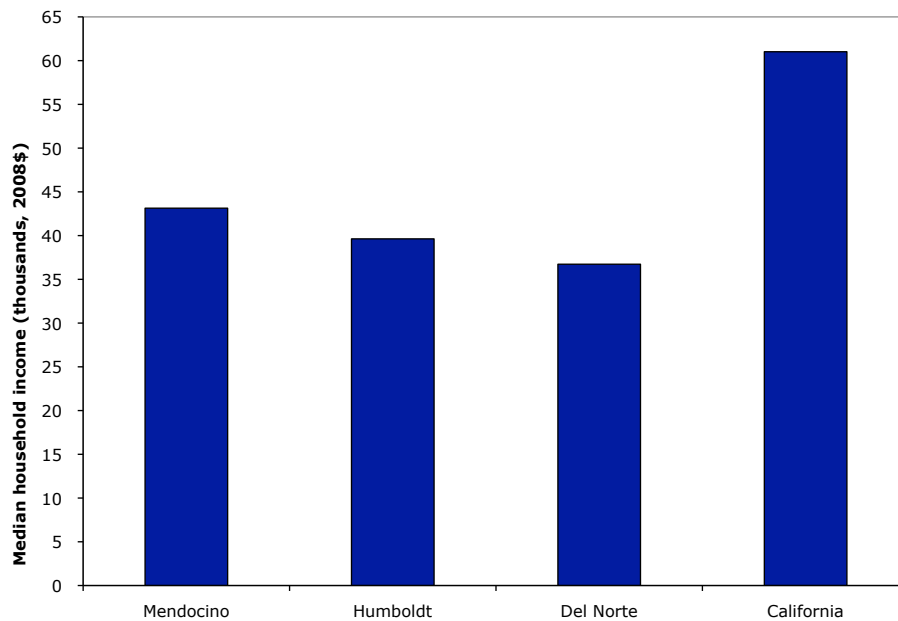


Figure 6. Median household income in Mendocino, Humboldt and Del Norte counties and statewide, 2008 (U.S. Census Bureau, State and County Quick Facts).

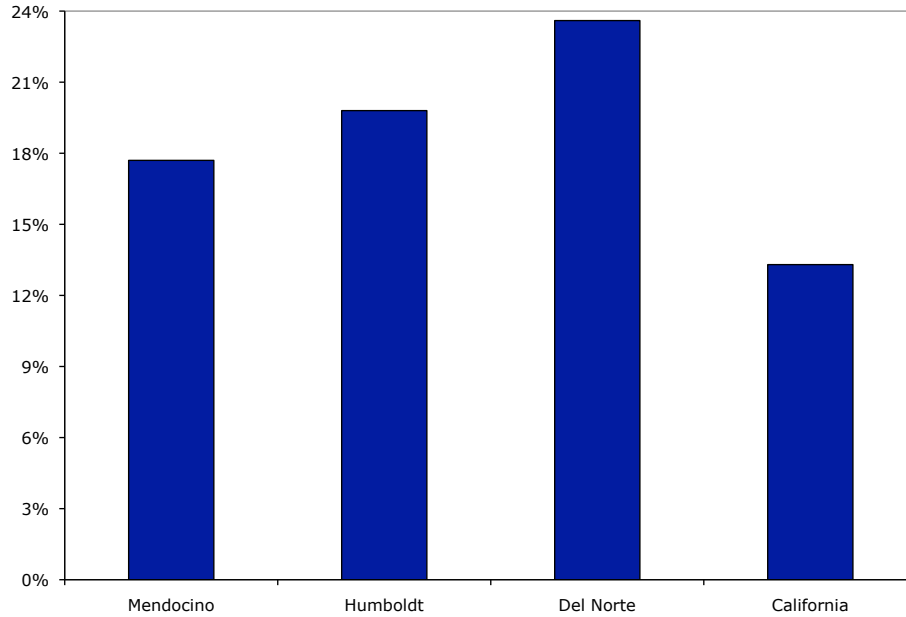


Figure 7. Percent of population below poverty level in Mendocino, Humboldt and Del Norte counties and statewide, 2008 (U.S. Census Bureau, State and County Quick Facts).

Race/Ethnicity and Foreign Born

In 2000, the proportion of the population identified as non-Hispanic white was 70% in Mendocino County, 79% in Humboldt County and 68% in Del Norte County, while the proportion foreign-born was 10%, 5%, and 6%, respectively (Figure 8). These numbers contrast sharply with California as a whole, where a minority of the population (42%) is non-Hispanic white and 26% are foreign-born.

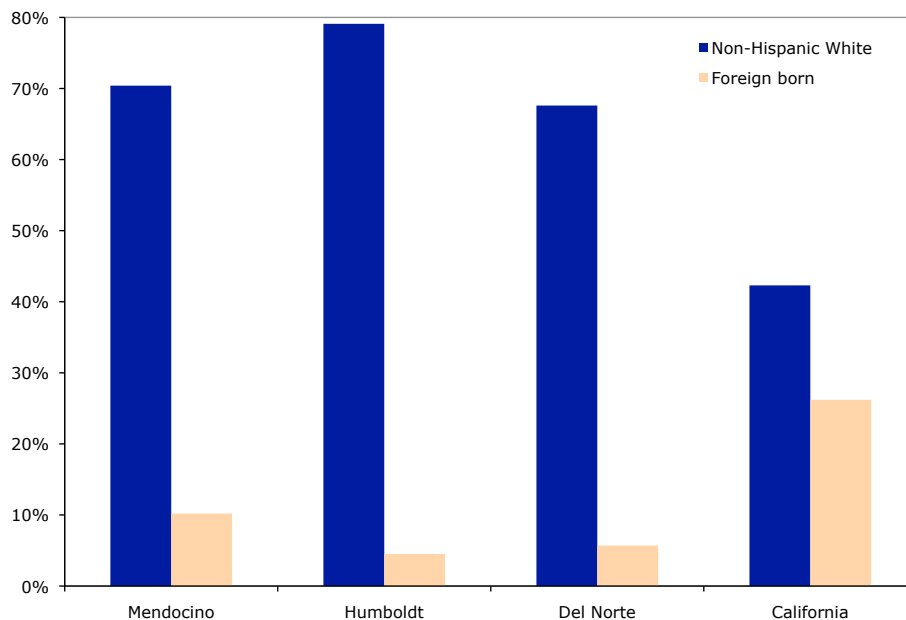


Figure 8. Percent of population identified as non-Hispanic white and percent foreign-born in Mendocino, Humboldt and Del Norte counties and statewide, 2000 (U.S. Census Bureau, State and County Quick Facts).

Economic Overview

Unemployment Rate

Until the early 2000s, the unemployment rate was notably higher in the North Coast counties (particularly Del Norte) than California as a whole (Figure 9). The gap between the statewide unemployment rate and the rates in Mendocino and Humboldt counties began narrowing in the early 2000s. In recent years, unemployment rates have increased in all three counties and statewide, reflecting the effects of the current recession. While the unemployment rate in Del Norte County has increased dramatically since 2006 (from 6.9% to 12.2% in 2009) and remains higher than elsewhere, the gap has narrowed in recent years between Del Norte County's rate and the rates experienced in Mendocino and Humboldt counties and California.

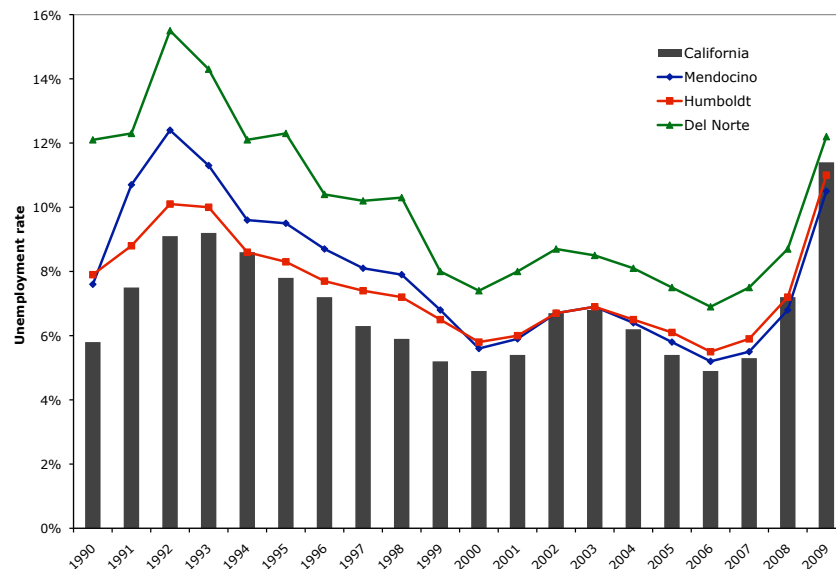


Figure 9. Unemployment rates in Mendocino, Humboldt and Del Norte counties and statewide, 1990–2009 (U.S. Department of Labor, Bureau of Labor Statistics).

Business Activity: County Business Patterns

The U.S. Census's County Business Patterns (CBP) provides annual, county-level information on economic activity by businesses with paid employees. Activity is described in terms of mid-March employment, first-quarter payroll, annual payroll, and number of establishments.⁵ Activity is categorized by sector, using the North American Industrial Classification System (NAICS).

Tables 5, 6 and 8 provide information on 2007 business activity by NAICS sector for each North Coast county. Adding across the Tables, 2007 business activity in the three counties combined included mid-March employment of 67,326, a first-quarter payroll of \$450.6 million, an annual payroll of \$1.9 million, and 6,884 establishments. Depending on which of these four CBP measures is considered, Mendocino County accounted for 37%–40%, Humboldt County for 52%–56%, and Del Norte County for 6%–8% of North Coast business activity. Humboldt County's contribution to business activity (53%) corresponds closely to its share of the 2007 tri-county population. Mendocino County's share of business activity (35%) is somewhat higher than its population share, while Del Norte County's contribution to business activity (12%) is lower than its population share.

For Mendocino and Humboldt counties, Construction, Manufacturing, Retail Trade, Health Care/Social Assistance, and Accommodation/Food Services each accounted for at least 10% of total business activity (according to at least one of the four CBP measures of economic activity Tables 5 and 6). For Del Norte County, the same sectors (with the exception of Manufacturing) also satisfied the 10% criterion (Table 7).⁶

Table 5. Mid-March employment, first-quarter payroll, annual payroll, and number of establishments with paid employees in Mendocino County, 2007, by NAICS sector (U.S. Census Bureau, CBP). Note: Blank cells indicate data withheld to ensure confidentiality. NAICS sectors accounting for at least 10% of total economic activity according to at least one of the four CBP measures of economic activity are bold and italicized.

NAICS Code	NAICS Sector	Mendocino County			
		Paid Employees March 12 Pay Period	First- Quarter Payroll (\$1000s)	Annual Payroll (\$1000s)	Total Establish- ments
11----	Agriculture/Forestry/Fishing/Hunting	506	3,654	24,327	60
21----	Mining				3
22----	Utilities				7
23----	<i>Construction</i>	<i>1,361</i>	<i>11,207</i>	<i>51,673</i>	<i>357</i>
31----	<i>Manufacturing</i>	<i>3,118</i>	<i>25,854</i>	<i>114,503</i>	<i>147</i>
42----	Wholesale Trade	758	6,521	33,506	94
44----	<i>Retail Trade</i>	<i>5,172</i>	<i>29,544</i>	<i>126,983</i>	<i>492</i>
48----	Transportation/Warehousing	582	5,987	25,147	49
51----	Information	353	3,570	12,800	48
52----	Finance/Insurance	600	5,924	23,864	97
53----	Real Estate/Rental&Leasing	632	2,989	11,972	141
54----	Professional/Scientific/Technical Svcs	734	5,237	23,115	214
55----	Management of Companies/Enterprises		7,167	34,235	12
56----	Admin/Support/WasteMgmt&RemedSvcs	424	2,454	11,103	99
61----	Educational Services	276	1,388	6,023	24
62----	<i>Health Care/Social Assistance</i>	<i>4,218</i>	<i>36,222</i>	<i>149,362</i>	<i>293</i>
71----	Arts/Entertainment/Recreation	957	4,741	18,876	53
72----	<i>Accommodation/Food Services</i>	<i>3,892</i>	<i>12,242</i>	<i>54,851</i>	<i>343</i>
81----	Other Services (except Public Admin)	885	4,503	18,799	219
99----	Unclassified		20	57	4
-----	Total	25,124	172,221	754,373	2,756

Table 6. Mid-March employment, first-quarter payroll, annual payroll, and number of establishments with paid employees in Humboldt County, 2007, by NAICS sector (U.S. Census Bureau, CBP). Note: Blank cells indicate data withheld to ensure confidentiality. NAICS sectors accounting for at least 10% of total economic activity according to at least one of the four CBP measures of economic activity are bold and italicized.

NAICS Code	NAICS Sector	Humboldt County			
		Employees Paid March 12 Pay Period	First-Quarter Payroll (\$1000s)	Annual Payroll (\$1000s)	Total Establishments
11----	Agriculture/Forestry/Fishing/Hunting	618	8,128	35,430	82
21----	Mining				
22----	Utilities				8
23----	<i>Construction</i>	<i>2,410</i>	<i>19,345</i>	<i>89,510</i>	<i>414</i>
31----	<i>Manufacturing</i>	<i>3,335</i>	<i>29,127</i>	<i>119,312</i>	<i>152</i>
42----	Wholesale Trade	1,204	10,506	44,425	109
44----	<i>Retail Trade</i>	<i>7,724</i>	<i>41,722</i>	<i>171,960</i>	<i>650</i>
48----	Transportation/Warehousing	973	7,864	36,735	94
51----	Information	635	5,406	21,090	61
52----	Finance/Insurance	1,300	15,373	58,201	169
53----	Real Estate/Rental&Leasing	633	3,801	16,937	183
54----	Professional/Scientific/Technical Svcs	1,807	12,955	54,361	269
55----	Management of Companies/Enterprises	145	1,133	3,720	12
56----	Admin/Support/WasteMgmt&RmdSvcs	1,112	7,654	30,105	117
61----	Educational Services	292	1,033	4,167	33
62----	<i>Health Care/Social Assistance</i>	<i>6,865</i>	<i>50,033</i>	<i>222,211</i>	<i>465</i>
71----	Arts/Entertainment/Recreation	1,056	4,425	18,939	61
72----	<i>Accommodation/Food Services</i>	<i>5,362</i>	<i>15,572</i>	<i>67,033</i>	<i>360</i>
81----	Other Services (except Public Admin)	1,782	9,596	39,601	347
99----	Unclassified			123	6
-----	Total	37,559	250,132	1,059,505	3,592

Table 7. Mid-March employment, first-quarter payroll, annual payroll, and number of establishments with paid employees in Del Norte County, 2007, by NAICS sector (U.S. Census Bureau, CBP). Note: Blank cells indicate data withheld to ensure confidentiality. NAICS sectors accounting for at least 10% of total economic activity according to at least one of the four CBP measures of economic activity are bold and italicized.

NAICS Code	NAICS Sector	Del Norte County Paid			
		Employees March 12 Pay Period	First-Quarter Payroll (\$1000s)	Annual Payroll (\$1000s)	Total Establishments
11----	Agriculture/Forestry/Fishing/Hunting	48	269	1,390	23
21----	Mining				
22----	Utilities				1
23----	<i>Construction</i>	201	1,116	5,600	73
31----	Manufacturing				11
42----	Wholesale Trade				10
44----	<i>Retail Trade</i>	1,040	5,617	22,903	75
48----	Transportation/Warehousing	158	1,273	5,522	15
51----	Information	124	995	4,105	14
52----	Finance/Insurance	134	981	3,926	27
53----	Real Estate/Rental&Leasing	106	610	2,726	32
54----	Professional/Scientific/Technical Svcs	139	1,122	4,268	38
55----	Management of Companies/Enterprises				
56----	Admin/Support/WasteMgmt&RmdSvcs	45	404	1,838	14
61----	Educational Services			626	5
62----	<i>Health Care/Social Assistance</i>	1,246	9,945	39,593	74
71----	Arts/Entertainment/Recreation				9
72----	<i>Accommodation/Food Services</i>	697	1,630	8,291	75
81----	Other Services (except Public Admin)	191	851	3,297	39
99----	Unclassified				1
-----	Total	4,643	28,231	116,874	536

Business Activity: Nonemployer Statistics

While CBP focuses on businesses *with* paid employees, the Census Bureau's Nonemployer Statistics data series provides information on businesses *without* paid employees who are subject to federal income taxes.⁷ In the three North Coast counties, the number of establishments without paid employees (20,935) is three times higher than the number with paid employees (6,884), although the number of people employed by the latter establishments (67,326) is more than three times the number of individuals (20,935) who are self-employed (Table 8).

Table 8. Number of establishments with paid employees and number of people employed by those establishments, and number of establishments without paid employees in Mendocino, Humboldt and Del Norte counties, 2007 (CBP and Nonemployer Statistics).

County	Establishments With Paid Employees		Number of Establishments Without Paid Employees
	Number of Establishments	Number of Employees	
Mendocino	2,756	25,124	8,577
Humboldt	3,592	37,559	11,034
Del Norte	536	4,643	1,324
Total	6,884	67,326	20,935

Table 9 describes the number of nonemployer establishments and their annual receipts in 2007 by NAICS sector.⁸ Sectors accounting for at least 10% of establishments and/or receipts include Construction, Real Estate/Rental&Leasing, and Professional/Scientific/Technical Svcs (all three counties), Retail Trade (Mendocino and Del Norte counties only), and Agriculture/Forestry/Fishing/Hunting and Health Care/Social Assistance (Del Norte County only).

Table 9. Total establishments and total receipts by businesses without paid employees in Mendocino, Humboldt and Del Norte counties, 2007, by NAICS sector (U.S. Census Bureau, Nonemployer Statistics). Note: Blank cells indicate data withheld to ensure confidentiality. NAICS sectors accounting for at least 10% of total establishments or receipts in a county are bold and italicized for that county.

NAICS Code	NAICS Sector	Mendocino		Humboldt		Del Norte	
		Total Estab	Receipts (\$1000s)	Total Estab	Receipts (\$1000s)	Total Estab	Receipts (\$1000s)
<i>11---</i>	<i>Agriculture/Forestry/Fishing/Hunting</i>	384	19,150	570	24,385	<i>175</i>	<i>7,856</i>
21---	Mining	5	315	27	1,627		
22---	Utilities	20	600	12	307		
<i>23---</i>	<i>Construction</i>	<i>1,372</i>	<i>73,976</i>	<i>1,738</i>	<i>80,773</i>	<i>127</i>	<i>6,915</i>
31---	Manufacturing	261	10,070	379	12,613	24	1,248
42---	Wholesale Trade	114	6,879	188	7,489	23	1,738
<i>44---</i>	<i>Retail Trade</i>	<i>633</i>	<i>34,530</i>	821	30,866	<i>124</i>	<i>5,550</i>
48---	Transportation/Warehousing	195	13,883	289	20,579	47	2,071
51---	Information	114	2,229	125	3,947	9	88
52---	Finance/Insurance	130	5,450	121	7,566	20	570
<i>53---</i>	<i>Real Estate/Rental&Leasing</i>	<i>565</i>	<i>36,646</i>	<i>780</i>	<i>56,820</i>	<i>103</i>	<i>6,079</i>
<i>54---</i>	<i>Professional/Scientific/Tech Svcs Admin/Sprt/</i>	<i>1,246</i>	<i>44,836</i>	<i>1,463</i>	<i>43,440</i>	<i>133</i>	<i>3,612</i>
56---	WasteMgmt&RmdSvcs	662	15,204	913	18,069	71	1,263
61---	Educational Services	171	3,059	229	2,948	23	216
<i>62---</i>	<i>Health Care/Social Assistance</i>	750	20,418	928	27,745	<i>163</i>	<i>5,158</i>
71---	Arts/Entertainment/Recreation	556	12,248	783	13,415	36	997
72---	Accommodation/Food Services Other Services (except Public	163	7,688	148	7,361	27	1,139
81---	Admin)	1,236	35,016	1,520	36,554	218	4,452
----	Total	8,577	342,197	11,034	396,504	1,324	48,958

Earnings by Place of Work

Both CBP and Nonemployer Statistics pertain to private sector business activity. The Department of Commerce data series, Earnings by Place of Work⁹, includes government as well as private earnings and thus provides a means of gauging the impact of government on county economies. Earnings in the three North Coast counties totaled \$5.8 billion in 2007: \$2.1 billion (37%) in Mendocino County, \$3.1 billion (54%) in Humboldt County, and \$520 million (9%) in Del Norte County (Table 10). Of this total, \$945.4 million (16%) was proprietors' income, \$3.5 billion (61%) was private earnings, and \$1.3 billion (23%) was government earnings.

Table 10. Earnings by place of work (2007\$, in thousands) in Mendocino, Humboldt and Del Norte counties, 2007 (U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System). Note: Blank cells indicate data withheld to ensure confidentiality.

Source of Earnings	Mendocino	Humboldt	Del Norte
Proprietors' Income (Farm & Nonfarm)	372,944	500,522	71,929
Private Earnings:			
Farm	9,255	42,689	11,818
Agriculture/Forestry/Fishing/Hunting	56,914		
Mining	3,287		
Utilities	16,665		
Construction	168,115	222,810	25,194
Manufacturing	147,484	174,940	8,907
Wholesale Trade	52,609	58,788	
Retail Trade	210,883	288,098	39,271
Transportation/Warehousing	39,727		7,296
Information	20,417	34,056	4,672
Finance/Insurance	45,341	106,287	5,760
Real Estate/Rental&Leasing	36,527	40,374	8,522
Professional/Scientific/Technical Svcs	74,388	138,420	9,106
Management of Companies/Enterprises	12,243	18,347	
Admin/Support/WasteMgmt&RmdSvcs	49,864	60,134	
Educational Services	9,775	8,822	961
Health Care/Social Assistance	195,348	308,835	60,315
Arts/Entertainment/Recreation	12,723	16,338	338
Accommodation/Food Services	88,540	91,851	15,992
Other Services (Except Public Admin)	102,762	156,418	16,905
Subtotal	1,352,867	1,930,294	235,239
Government Earnings:			
Federal Civilian/Military	28,878	84,462	14,562
State	38,831	182,704	108,859
Local	340,564	438,805	89,363
Subtotal	408,273	705,971	212,784
Total	2,134,084	3,136,787	519,952

In 2007, statewide earnings in California totaled \$1.4 trillion, comprised of 73% in private earnings, 13% in proprietors' income, and 14% in government earnings (Figure 10). By contrast, in Mendocino and Humboldt counties the private earnings share was lower (63% and 62%, respectively), and the shares attributable to proprietors' income and government earnings were somewhat higher (16%–18% and 19%–23%, respectively) compared to California. In Del Norte County, the private earnings share (45%) was considerably lower, whereas the government earnings share was considerably higher (41%) relative to the other counties and the state. Two indicators of the influence of government on Del Norte County's economy are the inordinate amount of public land in the county and the presence of Pelican Bay State Prison.

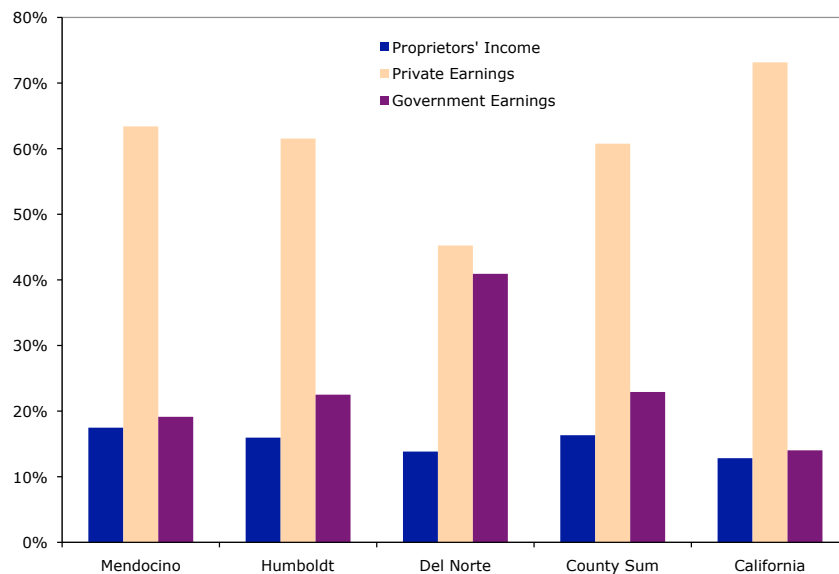


Figure 10. Percent of 2007 earnings in Mendocino, Humboldt and Del Norte counties and California attributable to proprietors' income, private earnings and government earnings (derived from Table 10).

The origin of government earnings in 2007 varied considerably by county and between the counties and the state (Figure 11). Federal civilian/military earnings comprised a much smaller share of government earnings in the three counties (7%–12%) than in the state (21%). The state share of government earnings in Mendocino, Humboldt and Del Norte counties was 10%, 26% and 51% respectively, while the local share in these counties was 83%, 62%, and 42%, respectively.

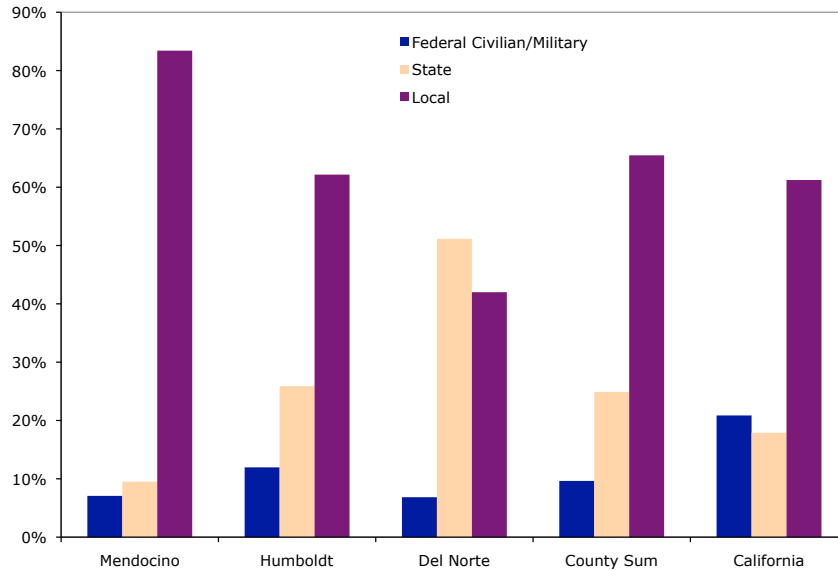


Figure 11. Percent of 2007 government earnings in Mendocino, Humboldt, Del Norte counties and California attributable to federal civilian/military, state and local government sources (derived from Table 10).

U.S. Census Information on Fishery-Related Business Activity

County Business Patterns

Estimates of mid-March employment, first-quarter payroll, annual payroll and number of establishments for NAICS sector 3117 (“Seafood Production, Preparation and Packaging”) are provided in Table 11 for the three North Coast counties. In 2003, the four establishments in Humboldt County reported first-quarter employment of 312, first-quarter payroll of \$1 million, and annual payroll of \$4.9 million. Employment and payroll generally declined between 2003 and 2005. For all other years and counties, CBP has suppressed information other than number of establishments to insure confidentiality.

Table 11. Mid-March employment, first-quarter payroll, annual payroll, and number of establishments associated with NAICS code 3117 (“Seafood Production, Preparation and Packaging”), by county, 2003–2007 (U.S. Census Bureau, CBP). Note: Blank cells indicate no data reported or data withheld to ensure confidentiality.

County and Year	Paid Employees March 12 Pay Period	First Quarter Payroll (\$1000s)	Annual Payroll (\$1000s)	Total Establishments
Mendocino				
2003				1
2004				1
2005				1
2006				1
2007				2
Humboldt				
2003	312	996	4,939	4
2004	416	885	3,590	3
2005	197	451	2,801	3
2006				3
2007				4
Del Norte				
2003				
2004				
2005				
2006				
2007				1

CBP estimates of mid-March employment, first-quarter payroll, annual payroll and number of establishments for NAICS sector 1141 (“Fishing”) are provided in Table 12 for the three North Coast counties. From 2003 through 2007, the number of fishing establishments declined in Mendocino County, remained fairly stable in Humboldt County, and increased in Del Norte County. As was the case for the seafood production sector (Table 11), much of the data for the fishing sector is suppressed. It is also important to note that, for reasons to be discussed in the next section, only a small fraction of the harvesting sector is represented in CBP.

Table 12. Mid-March employment, first-quarter payroll, annual payroll, and number of establishments associated with NAICS code 1141 (“Fishing”), by county, 2003–2007 (U.S. Census Bureau, CBP). Note: Blank cells indicate data withheld to ensure confidentiality.

County and Year	Paid Employees March 12 Pay Period	First-Quarter Payroll (\$1000s)	Annual Payroll (\$1000s)	Total Establishments
Mendocino				
2003				22
2004				17
2005	14	69	386	13
2006	15	234	622	12
2007		108	541	12
Humboldt				
2003				12
2004				10
2005				9
2006				10
2007		103	594	8
Del Norte				
2003	65	401	1,797	11
2004				11
2005				10
2006				14
2007	24	150	501	18

Nonemployer Statistics

Because CBP (Table 11 and Table 12) focuses on establishments with paid employees, Nonemployer Statistics is a more suitable source of data on the fishing sector, as fishermen largely consist of self-employed entities. Table 13 describes the number of vessels landing fish in each county (from PacFIN) and the number of fishing entities (as reported in Nonemployer Statistics) for the period 2003–2007. The numbers are not strictly comparable, as PacFIN was used to assign vessels to counties where they land fish, while nonemployer entities are assigned to their mailing address, which is not necessarily where they do business. Moreover, it is not clear what mix of fishermen (e.g., vessel operators, crew members) is included in Nonemployer Statistics. Thus, while Nonemployer Statistics provides general county-level information on the fishing sector, specialized fishery databases like PacFIN are more precise and detailed in terms of conveying the nature and extent of fishing vessel activity. Most of the commercial fishery analysis contained in the remainder of this report is based on PacFIN data.

Table 13. Number of boats making commercial landings at North Coast ports, and number of nonemployer entities associated with NAICS code 1141 (“Fishing”), by county, 2003–2007 (PacFIN and U.S. Census Bureau, Nonemployer Statistics).

County and Year	Commercial Fishing Vessels	Nonemployer Fishing Entities
Mendocino		
2003	324	157
2004	319	152
2005	290	136
2006	205	132
2007	259	149
Humboldt		
2003	189	208
2004	196	217
2005	144	210
2006	142	203
2007	223	217
Del Norte		
2003	155	120
2004	169	132
2005	137	123
2006	155	129
2007	158	135

MANAGEMENT OF NORTH COAST FISHERIES

Passage of the federal Fishery Conservation and Management Act (MSA) in 1976 led to the establishment of regional management councils, including the Pacific Fishery Management Council (PFMC). The PFMC implemented its Salmon Fishery Management Plan (FMP) in 1977 and its Groundfish FMP in 1982.

As a voting member of the PFMC, the state of California plays an important role in federal salmon and groundfish management and also has jurisdiction over recreational fisheries (which occur largely in state waters). State management jurisdiction also extends to the nearshore commercial groundfish fishery, as well as other important North Coast fisheries including crab, urchin and shrimp.

This section discusses commercial and recreational fishery management as it relates to North Coast fisheries. Salmon and groundfish are the major focus of this discussion, as regulations for these fisheries are inordinately complex and dynamic and have had profound effects on fishery participants and communities.

Commercial Fishery Management

Commercial Salmon Fishery

The PFMC manages the West Coast commercial salmon fishery under its Salmon FMP. Since the early 1980s, the PFMC has followed a policy of “weak stock management” whereby fishing for healthier stocks in mixed-stock ocean fisheries is constrained to meet management requirements for less abundant stocks. Klamath River fall Chinook has customarily been the constraining stock for the ocean fishery south of Cape Falcon, Oregon. The PFMC’s approach to management has been to impose stringent regulations in those areas with greatest impact on Klamath fall Chinook, namely the Klamath Management Zone (KMZ; roughly encompassing Curry county in Oregon and Humboldt and Del Norte counties in California) and to a lesser extent the Fort Bragg management area (roughly encompassing Mendocino County). By severely constraining harvest in the KMZ, the PFMC is able to maintain fishing opportunities in areas farther from the KMZ (e.g., San Francisco, Monterey) that have lesser impacts on this stock.

Management measures for the commercial salmon fishery include a complex mix of size and landing limits, gear restrictions and area and season closures. Salmon trollers are also subject to the state’s limited entry program, which was implemented in 1982. From early on, the KMZ has been a focal point of PFMC management. By 1984 the PFMC shortened the commercial salmon season in the KMZ to approximately two months, much shorter than the five- to six-month season in other areas south of Cape Falcon. At times, the commercial season in the California KMZ has been only days or weeks in duration, with complete closures occurring in years of particularly low Klamath escapement (e.g., 1985).¹⁰ Figure 12 depicts the very different season constraints imposed in the California KMZ, Fort Bragg and San Francisco management areas from 1981 through 2007.

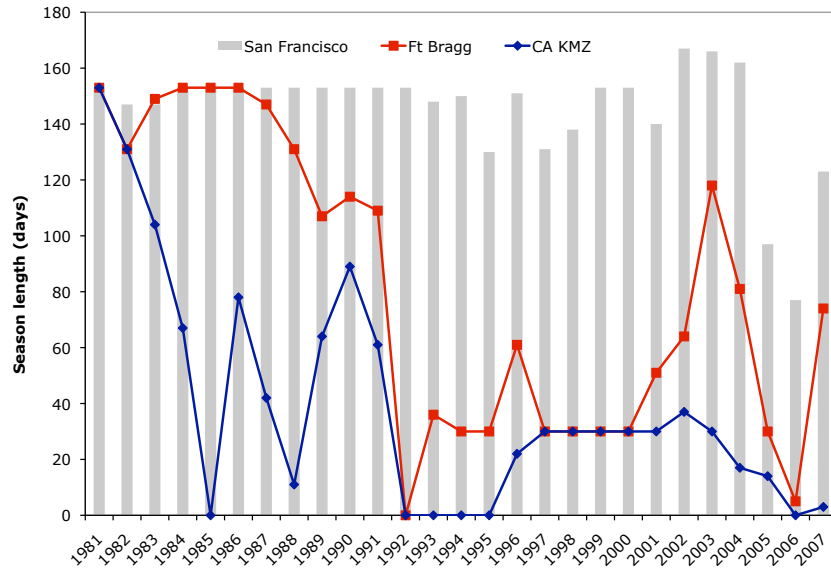


Figure 12. Length (days) of the commercial Chinook salmon troll season in the San Francisco, Fort Bragg and California KMZ management areas (PFMC 2002, PFMC 2009).

Beginning in 1992, the PFMC prohibited retention of coho in the commercial salmon fishery south of Cape Falcon due to conservation concerns regarding Oregon Coastal Natural (OCN) coho (PFMC 1992). This decision led to fishery disaster declarations for California and Oregon fishing communities in 1994 and 1995.¹¹ Although the KMZ commercial fishery was not as dependent on coho as fisheries further north, the California KMZ was completely closed from 1992 through 1995, largely due to more localized factors that compounded the effects of the coho nonretention policy. In 1993, Klamath fall Chinook was declared overfished, after failing to meet the PFMC’s spawner escapement floor for three consecutive years (PFMC 1994). The same year, the Department of Interior Solicitor issued an opinion allocating 50% of Klamath-Trinity River salmon to the Yurok and Hoopa tribes. This was significantly higher than the 30% tribal allocation brokered by the Klamath Fishery Management Council in a previous 1987–1991 agreement, and required reduced allocations to nontribal fisheries (including the commercial fishery in the KMZ; Pierce 1998).¹²

In 2006, failure of Klamath fall Chinook to achieve its escapement floor for the third consecutive year triggered a conservation alert and prompted the PFMC to close the commercial fishery in the California KMZ and curtail the season in other areas. In 2008 and 2009, unprecedented low escapements of Sacramento River fall Chinook caused the Sacramento fall run to replace the Klamath fall run as the constraining stock. The management response included unprecedented closures of California’s commercial fishery and dramatically curtailed seasons in Oregon. These three recent closures were accompanied by disaster relief for affected fishing communities.

Commercial Groundfish Fishery

The PFMC implemented its Groundfish FMP in 1982 and managed the commercial fishery with measures such as harvest guidelines, trip landing and trip frequency limits, species size limits, and gear restrictions (e.g., biodegradable escape ports for pots, mesh size limit for trawls). In 1992 the

PFMC adopted a harvest rate policy for groundfish, based on scientific evidence indicating that this would result in harvests approximating maximum sustainable yield for the range of productivities exhibited by other well-studied groundfish stocks with long histories of exploitation. Over the next eight years, growing scientific evidence indicated that the productivity of *Sebastes* rockfish was anomalously low relative to other groundfishes, prompting the PFMC to adopt increasingly restrictive management measures for rockfishes.¹³ However, these measures came too late to reverse the effects of longstanding harvest policies based on inaccurate productivity assumptions (Ralston 2002).

Eight groundfish stocks were declared overfished between 1999 and 2002¹⁴, and a fishery disaster was declared by the Secretary of Commerce in 2000. In order to rebuild overfished stocks, optimum yields (OYs) and trip landing limits were drastically reduced and became more finely delineated to species. Moreover, these reductions were not confined to depleted and overfished stocks. To minimize bycatch of depleted stocks, species-to-species landing limit ratios were adjusted to constrain harvests of healthier stocks that are typically taken with depleted ones; as a result, harvests of healthier stocks often fell well below their OYs. Harvest constraints required drastic reductions in trip landing limits, which had the unintended consequence of increasing regulatory-induced discards. To give vessels the operational flexibility needed to minimize such discards, trip limits were replaced with vessel cumulative landing limits that gradually expanded in duration from one- to two-week to one- to two-month limits. Groundfish fishery sectors are also subject to inseason adjustment to two-month landing limits or outright closure (as needed) to ensure congruence between actual harvests and OYs for constraining stocks.

Additional measures to minimize bycatch of overfished stocks included restrictions on the use of large footropes (2000)¹⁵, season closures (reversing the PFMC's longstanding policy of maintaining a year-round groundfish fishery), and establishment of Rockfish Conservation Areas (RCAs; 2002), closures on the continental shelf where overfished rockfishes tend to concentrate.¹⁶ Although limited entry permits for trawl and fixed gear vessels had been required since 1994, the dramatic decline in harvest opportunities since the late 1990s exacerbated the problem of excess harvest capacity, leading to measures such as permit stacking for sablefish fixed gear vessels (2001)¹⁷, and an industry-funded buyback (2003)¹⁸ and individual quotas (pending in 2011) for groundfish trawlers. In addition to the long-standing trawl logbook requirement (1981), an observer program was implemented to monitor discarded fish (2001)¹⁹, and vessel monitoring systems (VMS) were required for limited entry trawl and fixed gear vessels (2004) and open access groundfish vessels and nongroundfish trawlers (2007) to better monitor compliance with closed areas. Also, to address a MSA requirement to protect essential fish habitat (EFH), additional areas over and above the RCAs were closed to vessels operating with bottom trawl or bottom contact gear (2006).

Under the Groundfish FMP, open access vessels are given small groundfish landing limits that allow smaller vessels to target groundfish in modest quantities and nongroundfish vessels to harvest groundfish incidentally while discouraging targeting. Like their limited entry counterparts, these vessels have also been subject to shrinking OYs, increasingly restrictive landing limits, and season and area closures to protect overfished rockfishes. Some nongroundfish vessels have also been subject to groundfish-related regulations. For instance, restrictions on shrimp trawlers include finfish excluder devices to minimize groundfish bycatch (2002), area closures to protect groundfish EFH (2006), and VMS (2007).

During the 1990s, development of a lucrative, live fish fishery for nearshore species (largely groundfish) encouraged entry into the groundfish directed open access fishery. By 1999, 1,128 individuals participated in California's nearshore commercial fishery. To prevent further expansion of the fishery, the state began requiring a nearshore fishery permit to harvest shallow nearshore species. In accordance with the 1998 MLMA, the state implemented the Nearshore FMP in 2002 and adopted a nearshore restricted access program in 2003 as means of achieving the statewide capacity goal of 61 participants. Under the program, 216 transferable, nearshore fishery permits and 286 nontransferable, deeper nearshore fishery permits were issued. The transferable permits were issued on a regional basis: 29 for the North Coast, 38 for the North Central Coast, 83 for the South Central Coast, and 74 for the South Coast.²⁰ Despite considerable attrition, the number of permits remains well above the capacity goal (CDFG 2006b). Sixteen of the 19 species covered by the Nearshore FMP are also included in the PFMC's Groundfish FMP. The PFMC's groundfish management specifications reflect state recommendations regarding harvest management of these species.

Other Commercial Fisheries

The state manages the Dungeness crab fishery on the basis of a "three S" (sex, size, season) strategy that includes male-only harvest (since 1897), a minimum size limit (since 1911) and a limited season (since 1957). In 1992, the state placed a moratorium on entry; in 1995, a restricted access program was implemented. The northern crab season usually runs from December 1 through July 15 (with an early season opener off San Francisco starting November 15), but its start has been delayed in some years because of price disputes. In addition, the opening of the crab season may be delayed to ensure that males have completed molting, as occurred in 2005. In 2009, the state convened a Dungeness Crab Task Force in response to concerns about recent increases in participation and gear use. Following the recommendation of the Task Force (California Dungeness Crab Task Force 2010), a bill that would establish a pilot crab pot allocation program to address those concerns (SB 1039, Wiggins) is pending in the State Legislature.

Shrimp trawlers are subject to state regulations in addition to those related to federal groundfish management. State management includes limited entry (for vessels north of Point Conception), a November-March closure (to protect egg-bearing females), and maximum count-per-pound and minimum mesh size (to protect juvenile shrimp; CDFG 2007). In 2008, trawling for shrimp in state waters, which had previously been limited to the area between two and three miles from shore, was prohibited in all state waters.

The urchin fishery is managed exclusively by the state. In 1987, the California Fish and Game Commission implemented a moratorium on new urchin permits, and restricted access in 1989. The following year, an effort reduction scheme was implemented, and within-season closures were added in the early 1990s. In 2003, the state eliminated the week-long closures that occurred statewide from May through September, in response to an effort decline in the fishery (induced by regulatory and market conditions) and industry concerns that the closures made it difficult to maintain a consistent market presence during the summer months (CDFG 2004).

Recreational Fishery Management

Recreational fisheries on the North Coast, which primarily target salmon and groundfish, have contracted over time, largely due to salmon restrictions in the KMZ and rebuilding requirements for overfished rockfishes (which include a number of recreationally important species).

Recreational Salmon Fishery

Since the late 1970s, concerns regarding Klamath fall Chinook have influenced management of recreational as well as commercial salmon fisheries in the KMZ. Many of the factors constraining the KMZ commercial fishery (i.e., the Klamath fall Chinook escapement floor; 50/50 tribal/nontribal allocation initiated in 1993; stringent constraints on coho retention, which began in 1994 for the recreational fishery) also have affected the KMZ recreational fishery.

However, due to its lesser impact on Klamath fall Chinook, the KMZ recreational fishery has generally been less constrained than the KMZ commercial fishery (though more constrained than the recreational salmon fishery elsewhere in the state). In 1979, the KMZ recreational season and bag limit were reduced for the first time (PFMC 2005). In 1986, the season in the California KMZ was reduced from about nine to five months. Further season reductions occurred through the remainder of the 1980s. Since the early 1990s, seasons in the California KMZ have generally ranged from one to four months, with several notable exceptions (i.e., the 14-, zero-, and ten-day openings in 1992, 2008, and 2009 respectively). This is in contrast to other parts of the state, where the recreational season generally extends for six to nine months (PFMC 2009).

In contrast to the KMZ, recreational fishing in the Fort Bragg management area (encompassing Mendocino County), as well as management areas further south, have much smaller impacts on Klamath fall Chinook and thus have generally been unaffected by measures taken to protect that stock. Figure 13 depicts the very different seasonal constraints imposed in the California KMZ relative to the Fort Bragg and San Francisco management areas from 1981 through 2007.

Since 2007, major concerns regarding the status of Sacramento River fall Chinook resulted in a dramatic and unprecedented shortening of recreational seasons statewide. The season in California's KMZ was zero days in 2008 and ten days in 2009. The Fort Bragg recreational season was 45 days in 2008 (significantly reduced from its normal eight to nine months) and zero days in 2009. While such severe restrictions were not new for the KMZ, they were unprecedented for the Fort Bragg area.

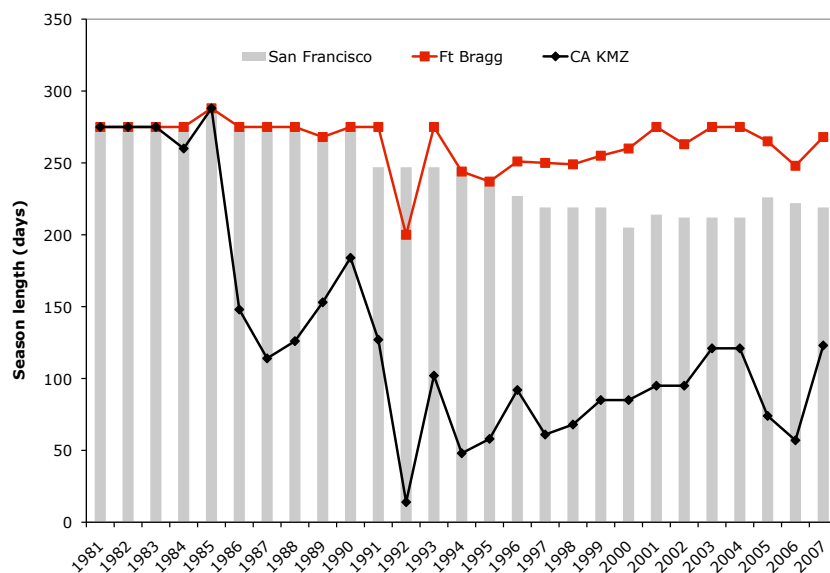


Figure 13. Length (days) of the recreational Chinook salmon season in the San Francisco, Fort Bragg and California KMZ management areas, 1981–2007 (PFMC 2002, PFMC 2009).

Recreational Groundfish Fishery

The recreational groundfish fishery has been increasingly constrained since the late 1990s to address concerns regarding depleted or overfished groundfish stocks (Table 14). California’s longstanding groundfish bag limit of 15 fish was reduced to ten fish in 2000. Beginning in 1998, sublimits were added to the overall groundfish bag limit to provide more specific protection to species of concern, and the number of species subject to sublimits has increased over time. Depth-based restrictions were first imposed in 2001 for selected species and for almost all species by 2003. By 2005, pre-season specifications included closures or depth-based restrictions for every month of the year. The once year-round recreational season was compressed to three to four months by 2008. In recent years, California has also considered implementing Yelloweye Rockfish Conservation Areas (YRCAs) – localized nearshore closures to protect yelloweye rockfish – in Northern California as inseason management measures, but instead has opted to close the season early to ensure that the yelloweye OY was not exceeded. Highly constraining OYs for overfished rockfishes require the state to make difficult trade-offs between closing areas (such as YRCAs) and shortening the fishing season.

Table 14. Recreational groundfish regulations, 1997–2008. Notes: Northern California defined as California/Oregon border to Cape Mendocino (including Del Norte County and most of Humboldt County), North Central California defined as Cape Mendocino to Point Arena (including Mendocino County and Southern Humboldt County). Season length includes effect of inseason closures. Month counted as closed if closed for at least four of eight species/species groups (nearshore rockfish, California scorpionfish and sheephead, cabezon, greenlings, ocean whitefish, shelf rockfish, lingcod) (CDFG).

Year	Lingcod Bag Limit	Rockfish Bag Limit	Rockfish Sub- limits	Season Length (Months)		Depth- Based Closures
				North CA	North Central CA	
1997	5	15	No	12	12	No
1998	3	15	Yes	12	12	No
1999	2	15	Yes	12	12	No
2000	2	10	Yes	12	12	No
2001	2	10	Yes	12	10	Yes
2002	2	10	Yes	12	8	Yes
2003	2	10	Yes	11	5	Yes
2004	2	10	Yes	12	5	Yes
2005	2	10	Yes	8	6	Yes
2006	2	10	Yes	8	6	Yes
2007	2	10	Yes	5	4	Yes
2008	2	10	Yes	4	3	Yes

Recreational Abalone Fishery

The recreational fishery for red abalone has been subject to regulation since the early 1900s, with measures related to gear use, timing, species, number and size of animals taken and other aspects of the fishery (CDFG 2006a). Starting in the 1950s, the use of scuba was prohibited, and the fishery was limited to daylight hours (one-half hour before sunrise to one-half hour after sunset). Since 1976, the season has been limited to April through June and August through November. Divers have been limited to red abalone since the mid-1990s, and in 1997, the fishery was closed south of San Francisco. In 2000, a mandatory report card and an annual limit of 100 abalone per person were implemented. Two years later, the daily bag limit for red abalone was reduced from four to three, and the annual limit was reduced from 100 to 24 per person due to concerns about the status of local stocks.

PRESENT DAY COMMERCIAL FISHERIES

Major North Coast Commercial Fisheries, 1981–2007

This section focuses on fishing activity in the three North Coast counties between 1981 and 2007.²¹ The information presented is based on customized summaries of Pacific Fisheries Information Network (PacFIN) landings receipt data, augmented by information from published and gray literature, as well as data from fieldwork conducted in 2007 and 2008. In the discussion that follows, the ‘long term’ is the period from 1981 through 2007, whereas ‘recent years’ pertains to the period from 2003 through 2007, unless otherwise noted. The purpose of focusing on these two time periods is to demonstrate how recent activity compares to longer-term historical levels. While the long-term trends discussed in this section begin in 1981, it should be noted that some North Coast fisheries (e.g., groundfish, salmon, crab) were established well before that year (see Figure 2 and Figure 3).

We use five measures of fishing activity derived from the landings receipt data. Landings are reported in ‘round weight’ (in pounds).²² Ex-vessel value represents the amount paid to fishermen at the first point of sale, usually to a dockside buyer or receiver. Average prices represent price per pound (round weight) and are calculated as the total ex-vessel value divided by total pounds. Both ex-vessel values and prices are adjusted for inflation with 2007 as the base year. Boat counts represent individual (resident and nonresident) vessels, though not necessarily individual vessel owners/operators as some individuals may own or operate multiple boats. Buyer counts are based on the number of unique buyers in the landings data, and include fishermen who land their own catch (e.g., for off-the-boat sales, direct sales to restaurants), as well as buyers who purchase fish from fishermen delivering their catch at the docks. The number of trips provides a count of the deliveries each boat makes at a port. To ensure confidentiality, data are not reported for some fisheries and/or years if fewer than three vessels or buyers participated in that year or fishery.

Fishing activity in North Coast counties has generally declined over the past 27 years (1981–2007; Figure 14). Landings and ex-vessel value peaked at 103.7 million pounds and \$80.4 million respectively in 1988. Since 1998, landings and value have been consistently below 45 million pounds and \$50 million, respectively. The number of boats declined precipitously from a peak of 2,550 in 1981 to 500 and fewer boats since 2005. The number of buyers ranged from 73 to 125, with no apparent trend.

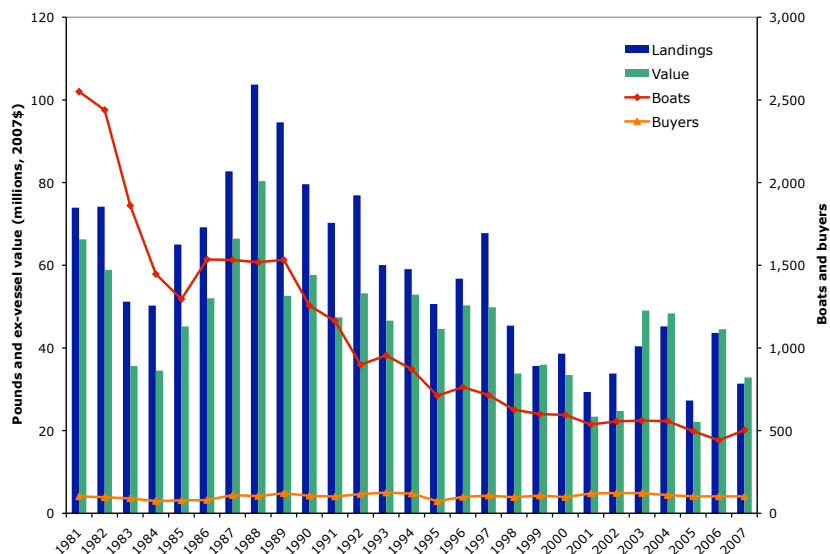


Figure 14. Landings (pounds, in millions), ex-vessel value (2007\$), and number of boats and buyers for North Coast fisheries, 1981–2007.

Average annual landings, value, boats, trips, and prices all declined in recent years relative to the long term, while number of buyers increased by a modest 5% (Table 15). To understand these changes, it is important to consider the nature of the individual fisheries on the North Coast and factors affecting each of them over time.

Table 15. Long-term and recent annual average, percent difference, and highs and lows for selected measures of fishing activity at North Coast ports, 1981–2007.

	Long-term average 1981–2007	Recent average 2003–2007	Percent difference	High year(s) (amount)	Low year(s) (amount)
North Coast fisheries					
Landings (lbs)	57,600,000	37,600,000	-35	1988 (103,700,000)	2005 (27,300,000)
Ex-vessel value (\$)	46,000,000	39,400,000	-14	1988 (80,400,000)	2005 (22,100,000)
Boats	1,056	512	-52	1981 (2,550)	2006 (441)
Buyers	103	108	+5	1993 (125)	1995 (73)
Trips	2,416	2,108	-13	1982 (3,880)	2002 (730)
Price (\$/lb)	2.04	1.81	-11	1983 (2.80)	1993 (1.46)

Since 1981, major commercial fisheries on the North Coast have included: crab pot, (nonwhiting) groundfish trawl, salmon troll, sablefish hook-and-line/pot, albacore troll, rockfish/lingcod hook-and-line/pot, urchin dive, whiting trawl, and shrimp trawl. The contribution of each fishery to North Coast landings, ex-vessel value, and fishing effort (boats and trips) depends on the nature of the fishery (e.g., high- versus low-volume, high- versus low-effort, high- versus low-price), biological, regulatory and market factors affecting that fishery, and the extent of concurrent opportunities in other fisheries.

The Dungeness Crab Pot Fishery

Crab pot landings and value are highly variable (Figure 15, Table 16). Between 1981 and 2000, North Coast landings ranged from 3.2 million to 11.5 million pounds, and value ranged from \$6.6 million to \$20.4 million.²³ Since 2001, the fishery has experienced more extreme swings, with landings ranging from 2.0 million to 20.2 million pounds, and value from \$5.4 million to \$34.0 million. The number of boats has declined over time from about 530 in 1981 and 1982 to 219–269 since 2001. From 1981 through 2007, 32–71 buyers participated in the fishery.

Crab pot

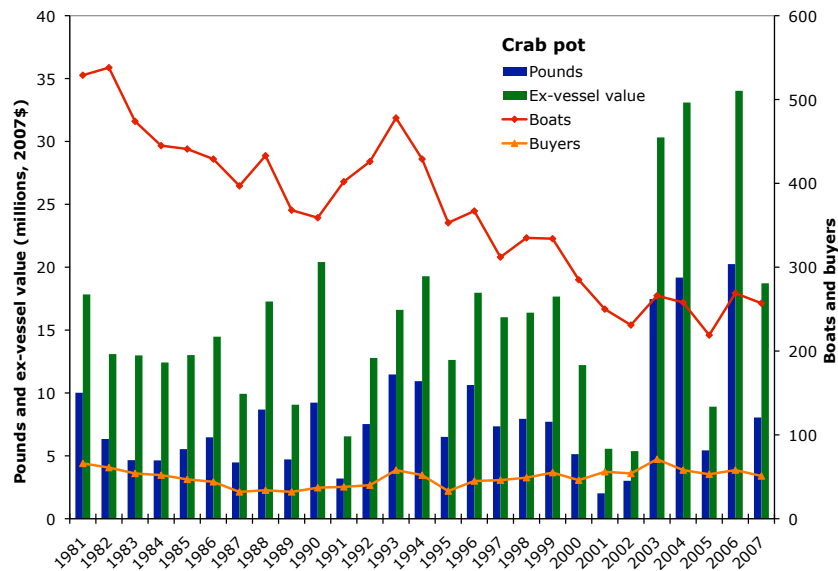
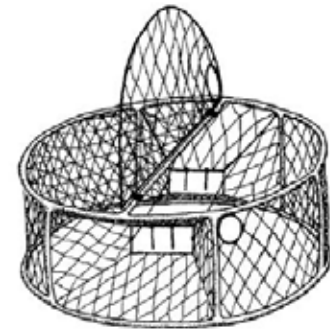


Figure 15. Landings (pounds), ex-vessel value (2007\$), and number of boats and buyers in the North Coast crab pot fishery, 1981–2007.

Crab landings and value increased in recent years relative to the long term by 74% and 59% respectively. While the number of boats declined by 31%, the number of trips declined by a lesser 12%, suggesting an increase in number of trips per boat.

Table 16. Long-term and recent annual average, percent difference, and highs and lows for selected measures of crab pot activity at North Coast ports, 1981–2007.

Crab Pot	Long-term average 1981–2007	Recent average 2003–2007	Percent difference	High year(s) (amount)	Low year(s) (amount)
Landings (lbs)	8,095,308	14,073,752	+74	2006 (20,246,945)	2001 (2,018,817)
Ex-vessel value (\$)	15,726,692	25,014,286	+59	2006 (34,025,965)	2002 (5,375,186)
Boats	366	254	-31	1982 (538)	2005 (219)
Buyers	49	58	+18	2003 (71)	1987,1989 (32)
Trips	5,623	4,913	-12	1981 (8,850)	2002 (1,978)
Price (\$/lb)	2.05	1.82	-11	1983 (2.79)	1993 (1.45)

The Groundfish Trawl Fishery

The groundfish trawl fishery has experienced large declines in landings, value, boats and buyers since 1981. In the late 1990s and early 2000s, eight groundfish stocks were declared overfished, leading to sharp reductions in vessel landing limits, area and gear restrictions, and a federal disaster declaration for West Coast groundfish. An industry-funded buyback was implemented in 2004 to deal with the overcapacity problem, which had been exacerbated by the reduction in harvest opportunities.

Groundfish trawl landings fell from 47.5 to 52.9 million pounds in 1981 and 1982 to 10.7 million pounds or less since 2003 (Figure 16, Table 17). The ex-vessel value of landings, which ranged from \$11.8 to \$20.9 million between 1981 and 1998, has been less than \$6.4 million since 2003. The number of boats fell from 93–107 between 1981 and 1985 to 25–31 since 2004. The precipitous decline from 56 boats in 2003 to 26 boats in 2004 is related to the implementation of the 2003 trawl buyback program. The number of buyers also declined, from 23 to 32 between 1981 and 1986 to three to five since 2003.

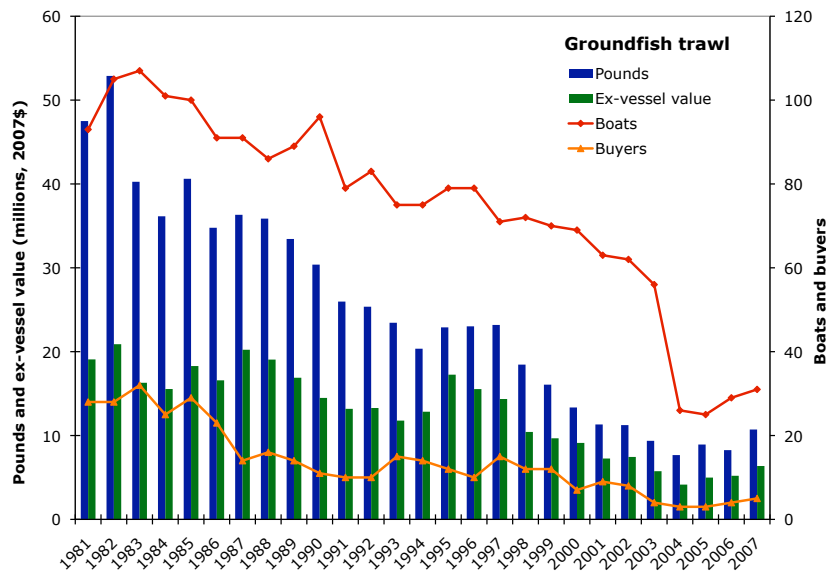
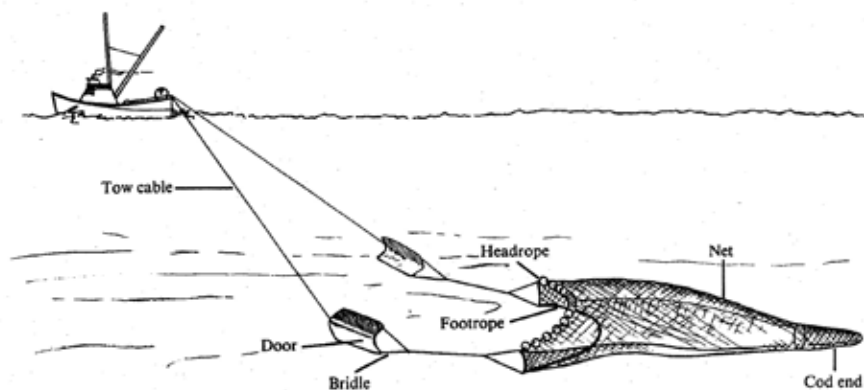


Figure 16. Landings (pounds), ex-vessel value (2007\$), and number of boats and buyers in the North Coast groundfish trawl fishery, 1981–2007.



Bottom trawler

Landings, landed value, and numbers of boats buyers and trips have all been considerably lower (by 55% to 72%) in recent years relative to the long term. While groundfish prices have increased, the increase has been too modest (+7%) to offset the decline in landings.

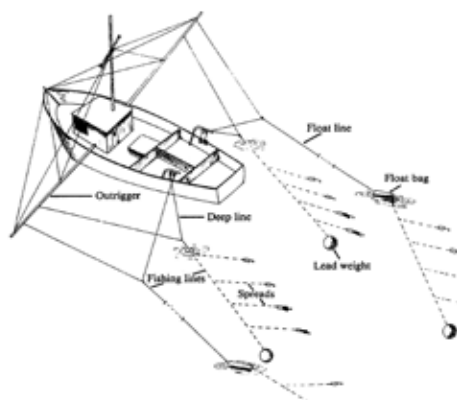
Table 17. Long-term and recent annual average, percent difference, and highs and lows for selected measures of groundfish trawl activity at North Coast ports, 1981–2007.

Groundfish Trawl	Long-term average 1981–2007	Recent average 2003–2007	Percent difference	High year(s) (amount)	Low year(s) (amount)
Landings (lbs)	24,732,976	8,987,454	-64	1982 (52,883,220)	2004 (7,667,833)
Ex-vessel value (\$)	12,812,254	5,289,022	-59	1982 (20,889,729)	2004 (4,147,816)
Boats	74	33	-55	1983 (107)	2005 (25)
Buyers	14	4	-71	1983 (32)	2004, 2005 (3)
Trips	1,910	538	-72	1983 (3,483)	2004 (408)
Price (\$/lb)	0.55	0.59	+7	1981–1983 (0.40)	1995 (0.75)

The Salmon Troll Fishery

Salmon troll landings on the North Coast were 3.8–4.5 million pounds in 1981 and 1982, declined precipitously during the 1982–1983 El Niño, then rebounded to 3.4–4.5 million pounds in 1987 and 1988 (Figure 17, Table 18). Ex-vessel value was also unusually high during the high-landing years, coinciding with periods of high prices. Beginning in the early 1990s, however, North Coast landings plummeted due to several factors, including a new 50/50 allocation of Klamath-Trinity River salmon between tribal and nontribal fisheries, and a PFMC declaration in 1993 that Klamath fall Chinook was overfished. Ongoing efforts to protect Klamath fall Chinook have resulted in disproportionate fishery restrictions in California’s KMZ (Humboldt and Del Norte counties) that continue to the present. Thus a large majority of North Coast salmon landings since the early 1990s, including the landings spike of 1.2–4.1 million pounds from 2002 through 2005, has occurred outside the KMZ (i.e., in Mendocino County). The number of boats declined precipitously from 2,137 in 1981 to 1,060 in 1984 (after implementation of California’s salmon limited entry program) to 39 during the 1992 El Niño. Although the number of trollers increased in subsequent years, it has exceeded 200 boats in only five years since 1993.

Salmon troll landings were 18% higher and ex-vessel value was 7% lower in recent years relative to the long term. The largest change, however, has been the 60% decrease in boats and 70% decrease in trips in this traditionally high-effort fishery.



Salmon troller

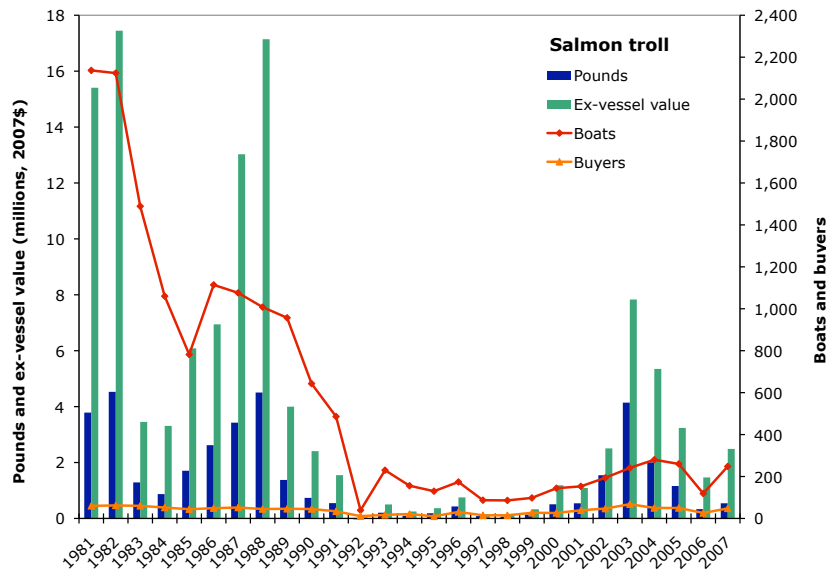


Figure 17. Landings (pounds), ex-vessel value (2007\$), and number of boats and buyers in the North Coast salmon troll fishery, 1981–2007.

Table 18. Long-term and recent annual average, percent difference, and highs and lows for selected measures of salmon troll activity at North Coast ports, 1981–2007.

Salmon troll	Long-term average 1981–2007	Recent average 2003–2007	Percent difference	High year(s) (amount)	Low year(s) (amount)
Landings (lbs)	1,384,526	1,636,664	+18	1982 (4,528,768)	1992 (12,664)
Ex-vessel value (\$)	4,386,894	4,073,848	-7	1982 (17,446,316)	1992 (38,259)
Boats	575	230	-60	1981 (2,137)	1992 (39)
Buyers	39	48	+23	2003 (68)	1995 (10)
Trips	5,723	1,731	-70	1982 (27,805)	1992 (111)
Price (\$/lb)	2.88	3.27	+14	2007 (4.59)	2002 (1.62)

The Sablefish Hook-and-Line/Pot Fishery

Ex-vessel sablefish prices, which ranged from \$0.60 to \$1.24 per pound between 1981 and 1994, increased to \$1.22–\$2.06 per pound between 1995 and 2006. The peak price of \$2.06 occurred in 1997 – also the year of peak revenue (\$3.1 million) and peak participation (127 boats) (Figure 18, Table 19). Revenues and participation in the post-1997 years have exhibited no discernible pattern. The number of buyers also peaked at 22 in 1997 but has declined to seven to 12 since 2002.



Finfish pot

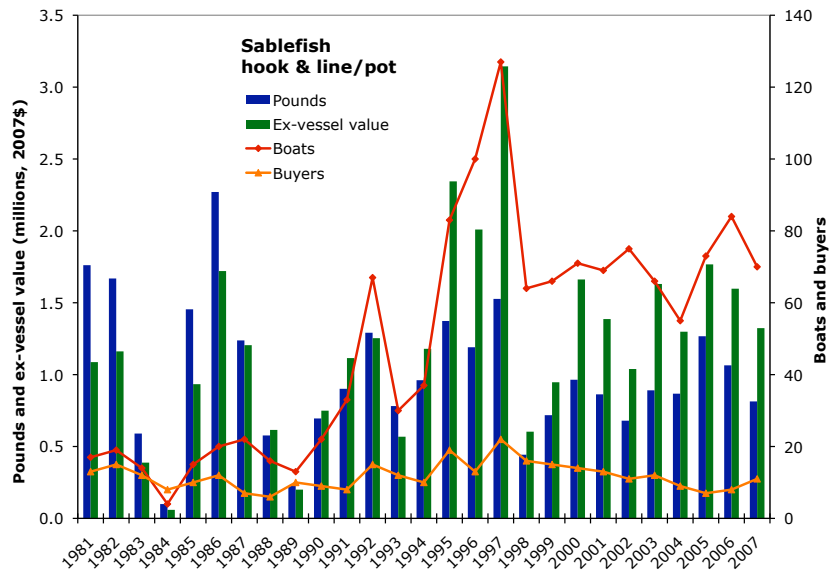
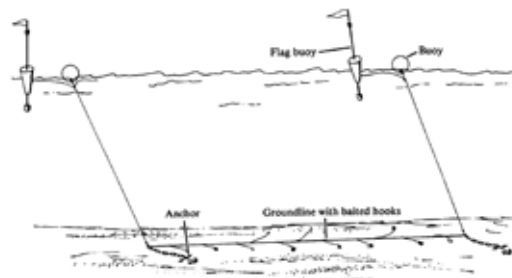


Figure 18. Landings (pounds), ex-vessel value (2007\$), and number of boats and buyers in the North Coast sablefish hook-and-line fishery, 1981–2007.

While sablefish landings peaked in 1986, all other measures of activity (value, boats, buyers, trips) peaked in 1997, the year of peak prices. Ex-vessel value, vessel participation and prices are considerably higher in recent years relative to the long term.

Table 19. Long-term and recent annual average, percent difference, and highs and lows for selected measures of sablefish hook-and-line activity at North Coast ports, 1981–2007.

	Long-term average	Recent average	Percent difference	High year(s)	Low year(s)
Sablefish hook-and-line	1981–2007	2003–2007		(amount)	(amount)
Landings (lbs)	1,006,595	980,695	-3	1986 (2,270,547)	1984 (99,609)
Ex-vessel value (\$)	1,221,810	1,523,439	+25	1997 (3,144,352)	1984 (59,354)
Boats	49	70	+43	1997 (127)	1984 (4)
Buyers	12	9	-25	1997 (22)	1988 (6)
Trips	795	793	0	1997 (2,925)	1984 (15)
Price (\$/lb)	1.22	1.57	+29	1997 (2.06)	1984 (0.60)



Bottom longline gear

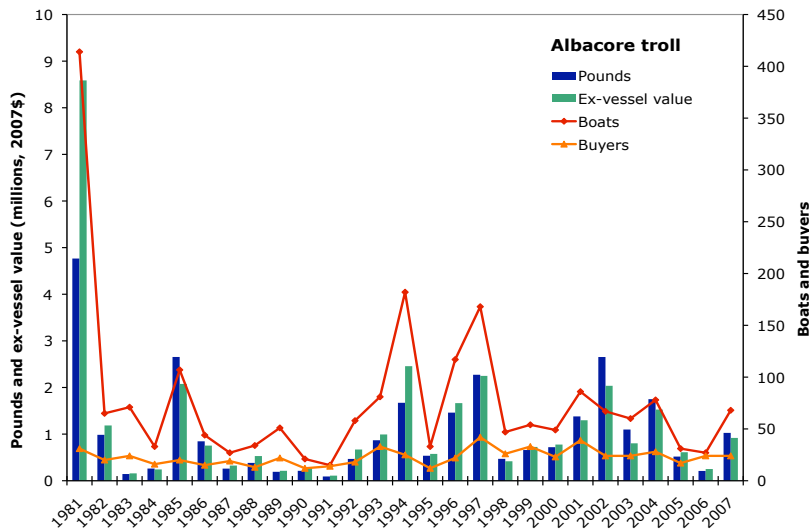


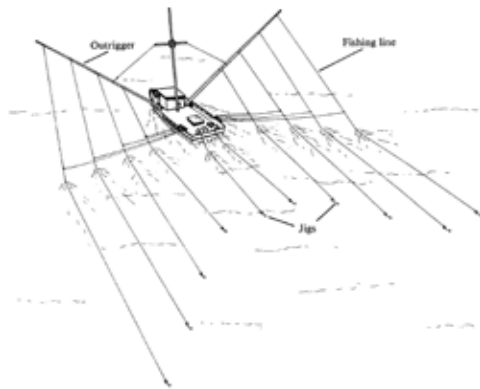
Figure 19. Landings (pounds), ex-vessel value (2007\$), and number of boats and buyers in the North Coast albacore troll fishery, 1981–2007.

The Albacore Troll Fishery

The precipitous decline in the albacore troll fishery in the early 1980s was a statewide phenomenon associated with the offshore relocation of California tuna canneries. While the high level of activity experienced in 1981 (4.8 million pounds, worth \$8.6 million landed at North Coast ports) has not been repeated in subsequent years, the fishery remains active. Since 1982, North Coast landings have ranged from 91,000 to 2.7 million pounds and value has ranged from \$109,000 to \$2.5 million, reflecting the highly variable availability of albacore to the fishery (Figure 19, Table 20). The fishery has declined in recent years relative to the long term in terms of landings, value, boats, trips and prices; the number of buyers, however, remains unchanged between the two periods.

Table 20. Long-term and recent annual average, percent difference, and highs and lows for selected measures of albacore troll activity at North Coast ports, 1981–2007.

	Long-term average 1981–2007	Recent average 2003–2007	Percent difference	High year(s) (amount)	Low year(s) (amount)
Albacore troll					
Landings (lbs)	1,057,484	920,326	-13	1981 (4,765,824)	1991 (91,317)
Ex-vessel value (\$)	1,200,794	821,933	-32	1981 (8,586,611)	1991(109,218)
Boats	77	53	-32	1981 (414)	1991 (15)
Buyers	23	23	0	1997 (42)	1990,1995 (12)
Trips	181	146	-19	1981 (665)	1995 (46)
Price (\$/lb)	1.10	0.97	-12	1981 (1.80)	2003 (0.73)



Albacore troller

The Rockfish/Lingcod Hook-and-Line Fishery

Rockfish/lingcod hook-and-line landings peaked at 3.0 million pounds and participation peaked at 604 boats in 1989; ex-vessel value peaked a year earlier (1988) at \$4.9 million (Figure 20, Table 21). Prices increased dramatically from less than \$0.70 per pound in the early 1980s to \$1.90–\$2.18 in 1987 and 1988, then fell in the 1990s, only to increase to new highs of \$2.41–\$3.04 since 2000. Despite the high prices in recent years, ex-vessel value has remained low due to the inhibiting effect of regulations on landings. Similarly, whereas prices increased by 60% in recent years relative to the long term, landings, value, boats, buyers and trips all declined over the same periods.

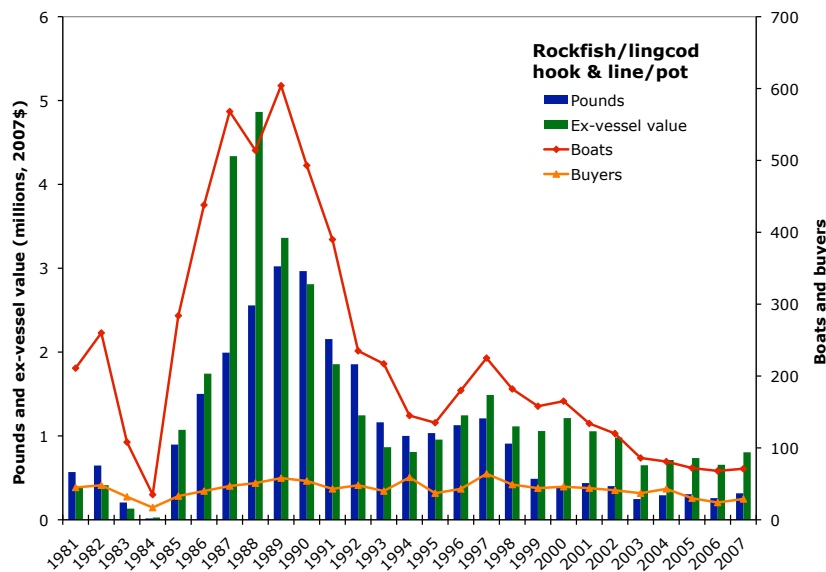


Figure 20. Landings (pounds), ex-vessel value (2007\$), and number of boats and buyers in the North Coast rockfish/lingcod hook-and-line fishery, 1981–2007.

Table 21. Long-term and recent annual average, percent difference, and highs and lows for selected measures of rockfish/lingcod hook-and-line activity at North Coast ports, 1981–2007.

Rockfish/Lingcod hook-and-line	Long-term average 1981–2007	Recent average 2003–2007	Percent difference	High year(s) (amount)	Low year(s) (amount)
Landings (lbs)	1,036,046	283,760	-73	1989 (3,022,601)	1984 (16,266)
Ex-vessel value (\$)	1,355,495	712,124	-47	1988 (4,864,368)	1984 (27,110)
Boats	229	76	-67	1989 (604)	1984 (35)
Buyers	42	33	-21	1997 (64)	1984 (17)
Trips	2,185	1,167	-47	1990 (4,808)	1984 (98)
Price (\$/lb)	1.57	2.51	+60	2000 (3.04)	1982 (0.64)

The Urchin Dive Fishery

The urchin fishery, which began in Southern California in the 1970s, developed in Northern California in the mid-1980s. Activity increased rapidly through the remainder of the decade as divers displaced from Southern California’s declining abalone fishery and some local salmon fishermen entered the local urchin fishery. The North Coast fishery declined substantially after 1989 amid a change in the quality of urchin roe and competition from other (international) sources. In recent years, the North Coast fishery is minimal relative to its peak in the late 1980s (Figure 21, Table 22). The decline in recent years relative to the long term is reflected in all measures of activity (landings, value, boats, buyers, trips, price), and is attributed to poor kelp production and market conditions.

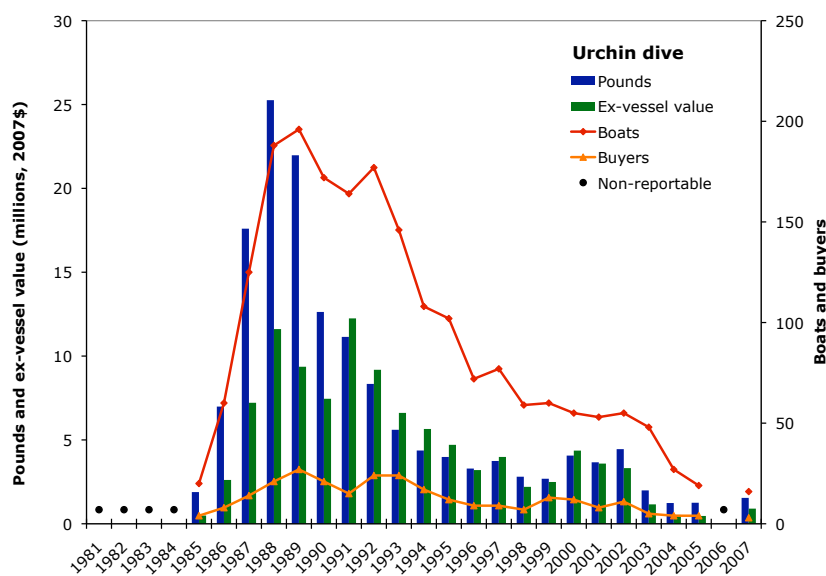


Figure 21. Landings (pounds), ex-vessel value (2007\$), and number of boats and buyers in the North Coast urchin dive fishery, 1981–2007. Note: Activity cannot be reported for 1981–1984 and 2006, when more than zero but fewer than three boats or buyers participated.

Table 22. Long-term and recent annual average, percent difference, and highs and lows for selected measures of urchin dive activity at North Coast ports, 1981–2007. Note: Years when fewer than three boats or buyers participated are included in averages, but excluded from highs and lows.

Urchin dive	Long-term average 1981–2007	Recent average 2003–2007	Percent difference	High year(s) (amount)	Low year(s) (amount)
Landings (lbs)	5,624,704	1,414,518	-75	1988 (25,259,807)	2006 (1,048,097)
Ex-vessel value (\$)	3,849,468	695,653	-82	1991 (12,247,189)	2006 (424,996)
Boats	75	25	-67	1989 (196)	2006 (15)
Buyers	10	4	-60	1989 (27)	2007 (3)
Trips	2,838	808	-72	1989 (8,245)	1985 (497)
Price (\$/lb)	0.89	0.47	-47	1994 (1.29)	1985 (0.26)

The Whiting Trawl Fishery

The whiting trawl fishery is a high-volume, low-value fishery. Whiting prices have declined from \$0.14 to \$0.16 per pound from 1981 through 1983 to \$0.08–\$0.12 from 1984 through 1992 to \$0.04–\$0.07 since 1993 (with the exception of 2000, when the price averaged \$0.09 per pound). Although annual landings and value cannot be reported for 2002–2006 due to the small number of boats and buyers involved, whiting remains an active fishery on the North Coast (Figure 22, Table 23).

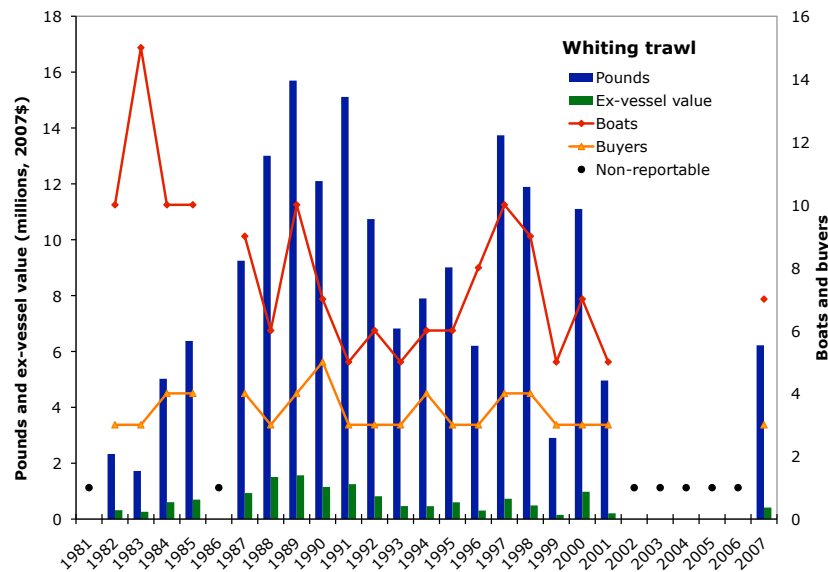


Figure 22. Landings (pounds), ex-vessel value (2007\$), and number of boats and buyers in the North Coast whiting trawl fishery, 1981–2007. Note: Activity cannot be reported for 1981, 1986, and 2002–2006, when more than zero but fewer than three boats or buyers participated.

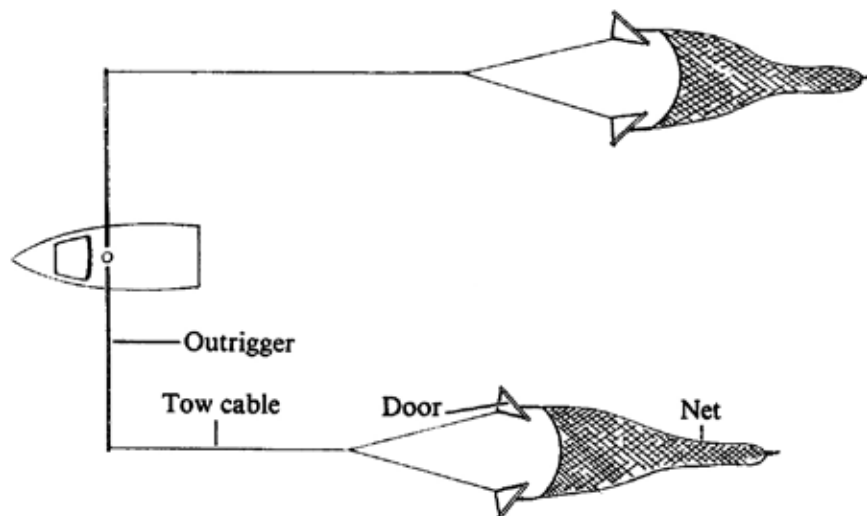
Table 23. Long-term and recent annual average, percent difference, and highs and lows for selected measures of whiting trawl activity at North Coast ports, 1981–2007. Note: Years when fewer than three boats or buyers participated are included in averages, but excluded from highs and lows.

Whiting trawl	Long-term average 1981–2007	Recent average 2003–2007	Percent difference	High year(s) (amount)	Low year(s) (amount)
Landings (lbs)	8,102,850	7,847,403	-3	1989 (15,695,972)	1983 (1,723,147)
Ex-vessel value (\$)	630,964	480,504	-24	1989 (1,566,861)	1999 (152,013)
Boats	7	4	-43	1983 (15)	2002,2003,2005 (3) 1982-1983,1988,1991- 1993,1995-1996, 1999–2001,2007(3)
Buyers	3	2	-33	1990 (5)	1999–2001,2007(3)
Trips	97	73	-25	1989 (195)	1999 (22)
Price (\$/lb)	0.08	0.06	-25	1981 (0.16)	1998, 2001 (0.04)

Whiting landings declined a modest 3% in recent years relative to the long term, while all other measures of activity (value, boats, buyers, trips, prices) have shown more marked declines (24%–43%). The fishery is highly variable, with landings ranging from 1.7 million to 15.7 million pounds and value from \$152,000 to \$1.6 million over the reportable years.

The Shrimp Trawl Fishery

The shrimp trawl fishery, which began operating on the North Coast in the 1950s, expanded in the 1970s largely due to technological changes in fishing (i.e., double-rig trawl nets) and processing (i.e., shrimp peeling machines; Frimodig et al. 2009). Landings and value on the North Coast peaked in 1992 at 18.8 million pounds and \$8.7 million, respectively, but declined markedly in subsequent years (Figure 23, Table 24). Vessel participation ranged from 33 to 106 boats during most of the 1981–2002 period (the exceptions being 16 boats in 1983 during the 1982–1983 El Niño and 24 boats in 2002). Annual activity cannot be reported for most years since 2003 due to the small number of buyers involved.



Double-rig trawl net

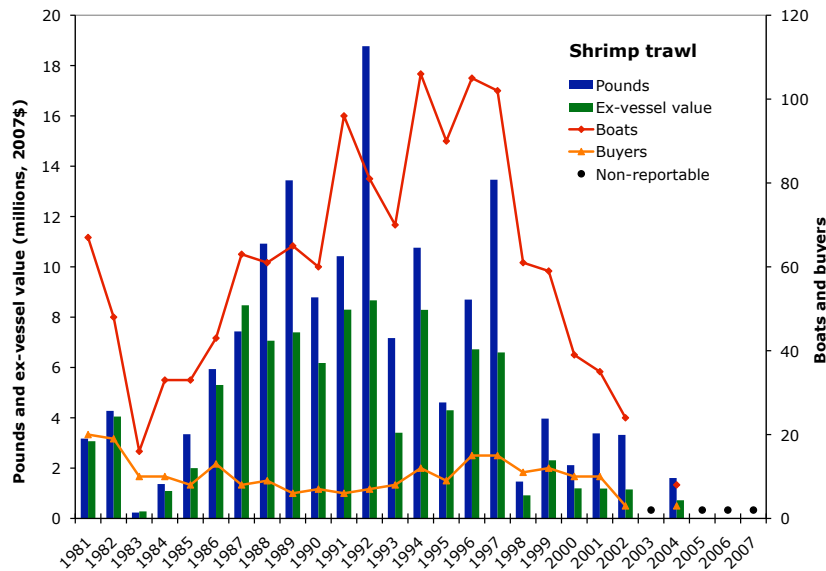


Figure 23. Landings (pounds), ex-vessel value (2007\$), and number of boats and buyers in the North Coast shrimp trawl fishery, 1981–2007. Note: Activity cannot be reported for 2003 and 2005–2007, when more than zero but fewer than three boats or buyers participated.

Table 24. Long-term and recent annual average, percent difference, and highs and lows for selected measures of shrimp trawl activity at North Coast ports, 1981–2007. Note: Years when fewer than three boats or buyers participated are included in averages, but excluded from highs and lows.

Shrimp trawl	Long-term average 1981–2007	Recent average 2003–2007	Percent difference	High year(s) (amount)	Low year(s) (amount)
Landings (lbs)	5,634,002	1,012,551	-82	1992 (18,769,592)	1983 (232,966)
Ex-vessel value (\$)	3,708,869	437,957	-88	1992 (8,668,566)	1983 (279,520)
Boats	52	7	-87	1994 (106)	2004 (8)
Buyers	9	2	-78	1981 (20)	2002, 2004 (3)
Trips	573	36	-94	1992 (1,251)	2004 (57)
Price (\$/lb)	0.66	0.42	-36	1983 (1.20)	2003 (0.32)

The shrimp fishery is highly variable, with landings ranging from 233,000 to 18.8 million pounds and value from \$280,000 to \$8.7 million over the reportable years. Shrimp trawl landings, value, boats, buyers and trips declined markedly in recent years (by 78% to 94%) relative to the long term. Prices also declined by a lesser but still notable amount (36%).

Commercial Fishing Activity by County

The figures presented in this section compare county trends in landings, ex-vessel value, boats, trips and buyers for all fisheries combined. The tables provide additional detail regarding fishery-specific activity in each county, and also describe North Coast fishing activity relative to statewide activity, by fishery.

Landings

Landings (for all fisheries combined) have generally been higher in Humboldt and Del Norte counties than Mendocino County (Figure 24). Humboldt accounted for a particularly notable share of North Coast landings from 1981 through 1985 (43%–51%) and 2002 through 2007 (46–56%). Del Norte County accounted for a notable share from 1991 through 2000 (40%–51%).

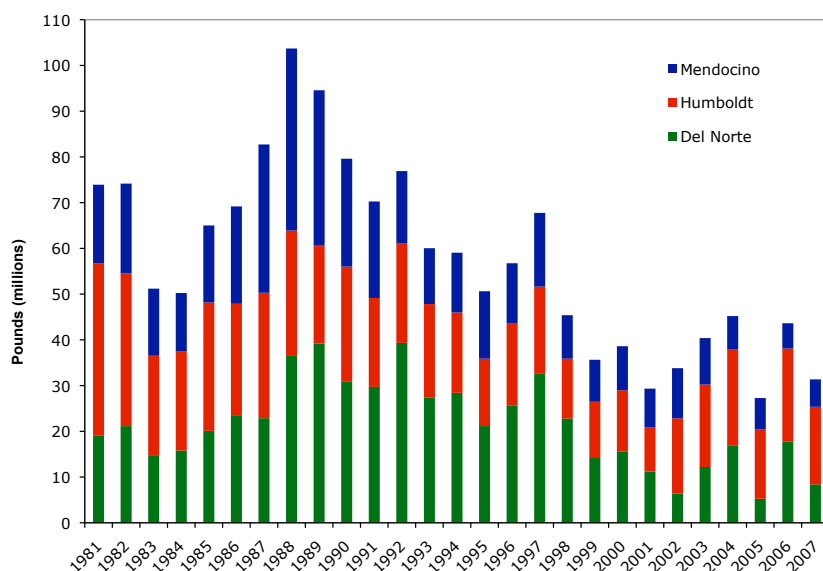


Figure 24. Landings (millions of pounds) by county, 1981–2007.

Not surprisingly, landings are dominated by fisheries characterized by high-volume harvest operations (e.g., crab, urchin, trawl fisheries for various species; Table 25). Fisheries accounting for at least 10% of landings from 1981 through 2007 and/or 2003 through 2007 (on an average annual basis) include groundfish trawl (all counties), crab pot and whiting trawl (Humboldt and Del Norte counties), urchin dive and salmon troll (Mendocino County), and shrimp trawl (Del Norte County). A majority of statewide crab, groundfish trawl, sablefish, whiting and shrimp trawl landings from 2003 through 2007 occurred on the North Coast.

Table 25. Long-term (1981–2007) and recent (2003–2007) average annual landings in Mendocino, Humboldt and Del Norte counties (thousands of pounds), and tri-county contribution to total California landings, by fishery. Notes: Bold, italicized numbers denote fisheries that comprised at least 10% of total landings in that county and period. Blanks denote periods when more than zero but fewer than three boats or buyers participated.

Fishery	Mendocino County		Humboldt County		Del Norte County		Tri-County Total		Tri-County as % of CA	
	1981–2007	2003–2007	1981–2007	2003–2007	1981–2007	2003–2007	1981–2007	2003–2007	1981–2007	2003–2007
	Avg	Avg	Avg	Avg	Avg	Avg	Avg	Avg	Avg	Avg
Crab pot	395	676	3,004	5,262	4,697	8,136	8,095	14,074	70	70
Groundfish trawl	7,337	2,959	12,319	4,653	5,077	1,375	24,733	8,988	56	65
Salmon troll	983	1,437	253	110	149	90	1,385	1,637	26	37
Sablefish H&L	518	534	298	291	190	156	1,007	981	33	53
Albacore troll	100	39	730	644	227	238	1,058	920	19	47
Rockfish H&L	343	61	264	28	429	194	1,036	284	23	20
Urchin dive	5,577	1,413	12		36		5,625	1,415	24	13
Whiting trawl		0.0	2,533		5,569		8,103	7,847	100	100
Shrimp trawl	215		822		4,598		5,634	1,013	83	60
All else	149	41.1	370	271	443	63	962	376	0	0
Total	15,619	7,161	20,604	18,282	21,414	12,090	57,637	37,533	14	12

Ex-Vessel Value

The ex-vessel value of landings has generally been highest in Del Norte and lowest in Mendocino County (Figure 25). From 1981 through 2007, landed value equaled or exceeded \$20 million in 11 years in Del Norte County, three years in Humboldt County, and two years

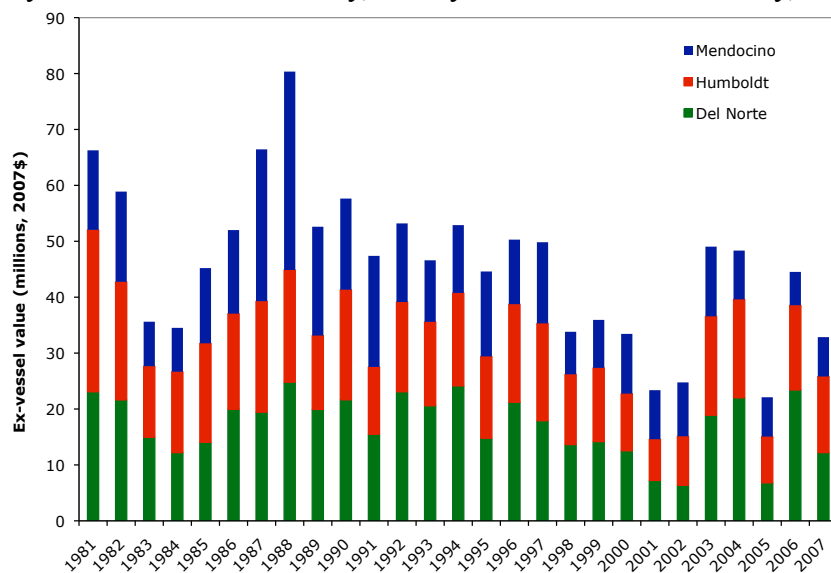


Figure 25. Ex-vessel value of landings (2007\$) by county, 1981–2007.

in Mendocino County. Mendocino County's average annual share of landed value was 21% in recent years (2003–2007) and 29% over the long term (1981–2007). Humboldt County's recent and long-term shares were 37% and 34%, while Del Norte County's shares were 42% and 38%.

Most of the same fisheries that dominate landings also accounted for at least 10% of landed value (on an annual average basis) from 1981 through 2007 and/or 2003 through 2007 (Table 26). Fisheries meeting this criterion in one or both of these periods included groundfish trawl and crab pot (all counties), salmon troll and urchin dive (Mendocino County), and shrimp trawl (Del Norte County). A majority of the landed value of crab, groundfish trawl, sablefish, and whiting in California from 2003 through 2007 are attributable to North Coast landings.

Table 26. Long-term (1981–2007) and recent (2003–2007) average annual ex-vessel value (\$1000s, 2007\$) of landings in Mendocino, Humboldt and Del Norte counties, and tri-county contribution to total California value, by fishery. Notes: Bold, italicized numbers denote fisheries that comprised at least 10% of total value in that county and period. To protect confidentiality, blanks denote periods when more than zero and fewer than three boats or buyers participated.

Fishery	Mendocino County		Humboldt County		Del Norte County		Tri-County Total		Tri-County as % of CA	
	1981–2007 Avg	2003–2007 Avg	1981–2007 Avg	2003–2007 Avg	1981–2007 Avg	2003–2007 Avg	1981–2007 Avg	2003–2007 Avg	1981–2007 Avg	2003–2007 Avg
Crab pot	848	<i>1,250</i>	<i>5,880</i>	<i>9,459</i>	<i>8,999</i>	<i>14,305</i>	<i>15,727</i>	<i>25,014</i>	69	68
Groundfish trawl	<i>3,761</i>	<i>1,727</i>	<i>6,341</i>	<i>2,741</i>	<i>2,711</i>	821	<i>12,812</i>	<i>5,289</i>	55	57
Salmon troll	3,011	<i>3,482</i>	852	322	524	270	<i>4,387</i>	<i>4,074</i>	28	34
Sablefish hook-and-line	634	795	393	486	195	243	1,222	1,523	39	54
Albacore troll	133	48	830	569	237	205	1,201	822	19	47
Rockfish hook-and-line	674	229	272	46	410	437	1,356	712	19	16
Urchin dive	<i>3,816</i>	695	10		24		3,850	696	20	10
Whiting trawl		0	223		408		631	481	100	100
Shrimp trawl	176		460		3,073		3,709	438	58	34
All else	201	20	249	106	677	198	1,126	324	1	1
Total	13,254	8,246	15,509	14,471	17,257	16,656	46,019	39,373	21	30

Vessel Participation

The decline in vessel participation in Humboldt and Del Norte counties in the early 1980s was largely precipitated by the implementation of stringent salmon troll regulations in California's KMZ (Figure 26). By contrast, salmon troll participation increased in Mendocino County to a peak of 815 boats in 1988. However, through the early 1990s and beyond, vessel participation steadily declined in all three counties, reflecting reduced opportunities in multiple fisheries.

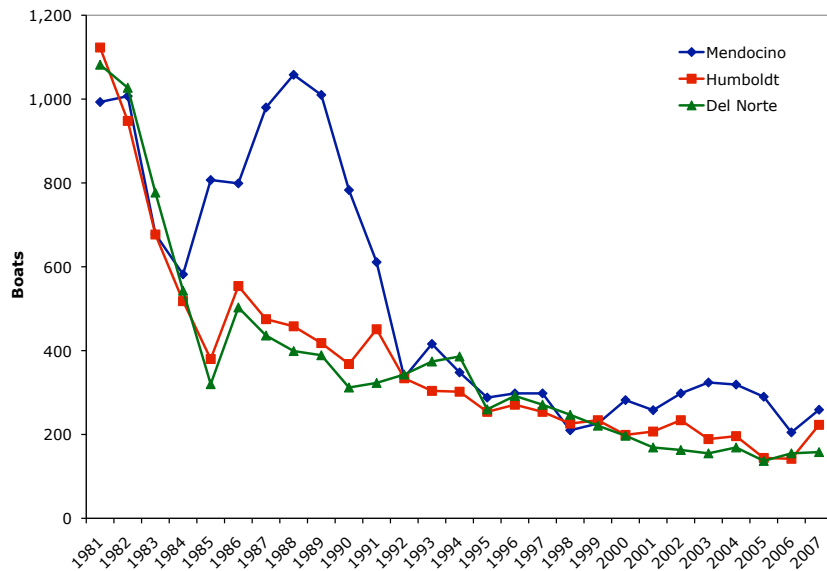


Figure 26. Number of commercial fishing boats, by county, 1981–2007. Note: Numbers are not additive across counties, as some boats fish in multiple counties.

While the downward trend in vessel participation is dominated by traditionally high-effort fisheries (most notably salmon troll, crab pot, and rockfish/lingcod hook-and-line), participation in almost all North Coast fisheries has been considerably lower in recent years (2003–2007) relative to the long term (Table 27). Fisheries involving at least 10% of the boats making landings in a county for the period 1981–2007 and/or 2003–2007 (on an average annual basis) included crab pot, salmon troll and rockfish hook-and-line (all counties), albacore troll (Humboldt and Del Norte counties), sablefish hook-and-line (Mendocino and Humboldt counties), groundfish trawl (Humboldt County), urchin dive (Mendocino County), and shrimp trawl (Del Norte County). From 2003 through 2007, the only fishery for which a majority of boats operated on the North Coast was whiting trawl, although crab pot, groundfish trawl and sablefish hook-and-line participation also was substantial.

Table 27. Long-term (1981–2007) and recent (2003–2007) average annual number of boats in Mendocino, Humboldt and Del Norte counties, and tri-county sum relative to total California boats, by fishery. Notes: Bold, italicized numbers denote fisheries involving at least 10% of total boats participating in that county and period. Total number of boats in each county and period is less than sum of boats participating in each fishery, as some boats participate in multiple fisheries; tri-county totals are less than sum of boats fishing in each county, as some boats fish in multiple counties. Blanks denote counties and periods when more than zero and fewer than three boats or buyers participated.

Fishery	Mendocino County		Humboldt County		Del Norte County		Tri-County Total		Tri-County as % of CA	
	1981–2007	2003–2007	1981–2007	2003–2007	1981–2007	2003–2007	1981–2007	2003–2007	1981–2007	2003–2007
	Avg	Avg	Avg	Avg	Avg	Avg	Avg	Avg	Avg	Avg
Crab pot	42	<i>43</i>	<i>156</i>	<i>103</i>	<i>189</i>	<i>125</i>	<i>366</i>	<i>254</i>	54	48
Groundfish trawl	21	11	36	18	28	8	74	33	42	39
Salmon troll	<i>357</i>	<i>195</i>	<i>183</i>	<i>57</i>	<i>134</i>	<i>29</i>	<i>575</i>	<i>230</i>	36	37
Sablefish H&L	26	<i>37</i>	18	<i>25</i>	9	9	49	<i>70</i>	42	41
Albacore troll	18	9	39	<i>26</i>	26	<i>20</i>	77	<i>53</i>	24	33
Rockfish H&L	<i>111</i>	<i>35</i>	<i>62</i>	15	<i>76</i>	<i>28</i>	<i>229</i>	<i>76</i>	22	19
Urchin dive	<i>74</i>	25	1		2		75	25	26	17
Whiting trawl		0	5		3		7	4	98	96
Shrimp trawl	5		15		41		52	7	49	20
Total	517	279	373	179	363	155	1,056	512	28	26

Fishing Trips

The general trend in fishing trips (Figure 27) – bimodal peaks in the early and late 1980s, followed by a steady decline – closely parallels the trend in vessel participation (see Figure 26). From 1985 through 2005, more trips were made in Mendocino County than in either of the other two counties. One major reason for this is that regulation of the high-effort salmon fishery have generally been less stringent in Mendocino than in the KMZ (Humboldt and Del Norte counties) since the mid-1980s. Mendocino County lost its dominance with regard to trips for the period 2006–2007, due largely to declines in salmon opportunities (which affected that county more than the other two counties) and a surge in the crab fishery (which benefited Humboldt and Del Norte counties more than Mendocino County).

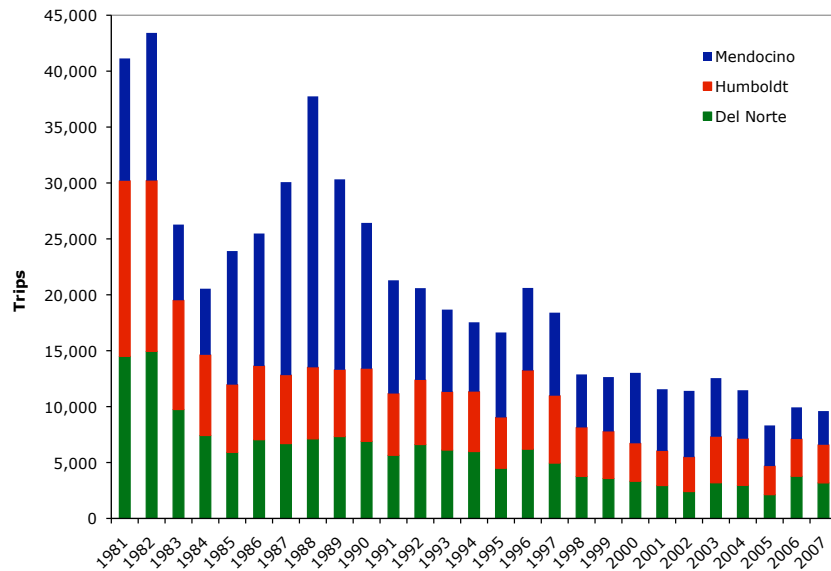


Figure 27. Number of commercial fishing trips, by county, 1981–2007.

For almost all fisheries, the number of trips has been lower in recent years relative to the long term (Table 28). Fisheries involving at least 10% of trips in a county during the 1981–2007 and/or 2003–2007 period (on an average annual basis) included crab pot and salmon troll (all counties), rockfish hook-and-line (Mendocino and Del Norte counties), sablefish hook-and-line and urchin dive (Mendocino County), and groundfish trawl (Humboldt County). The North Coast was the site of all whiting trawl trips, and about half of all crab trips for both periods .

Table 28. Long-term (1981–2007) and recent (2003–2007) average annual number of fishing trips in Mendocino, Humboldt and Del Norte counties, and tri-county contribution to total California trips, by fishery. Notes: Bold, italicized numbers denote fisheries that comprised at least 10% of total trips in that county and period. To protect confidentiality, blanks denote periods when more than zero and fewer than three boats or buyers participated.

Fishery	Mendocino County		Humboldt County		Del Norte County		Tri-County Total		Tri-County as % of CA	
	1981–2007 Avg	2003–2007 Avg	1981–2007 Avg	2003–2007 Avg	1981–2007 Avg	2003–2007 Avg	1981–2007 Avg	2003–2007 Avg	1981–2007 Avg	2003–2007 Avg
Crab pot	340	411	2,866	2,393	2,417	2,109	5,623	4,913	51	47
Groundfish trawl	524	165	908	271	478	102	1,910	538	41	28
Salmon troll	3,649	1,352	1,208	312	866	66	5,723	1,731	29	25
Sablefish H&L	509	581	217	162	69	51	795	793	40	38
Albacore troll	37	29	86	76	58	41	181	146	21	34
Rockfish H&L	617	453	364	152	1,204	562	2,185	1,167	21	20
Urchin dive	2,818	807	4		15		2,838	808	24	12
Whiting trawl		0	38		59		97	73	100	100
Shrimp trawl	23		65		485		573	36	25	3
All else	111	19	193	56	233	93	537	168	2	1
Total	8,629	3,816	5,949	3,510	5,883	3,047	20,462	10,373	23	18

Buyers

The average annual proportion of North Coast buyers receiving fish in Mendocino County was 54% from 2003 through 2007 and 49% from 1981 through 2007. By comparison, these proportions were 44% and 43% respectively for Humboldt County, and 25% and 32% for Del Norte County. The tendency for fewer buyers to operate in Del Norte County has been particularly noticeable since 2000 (Figure 28).

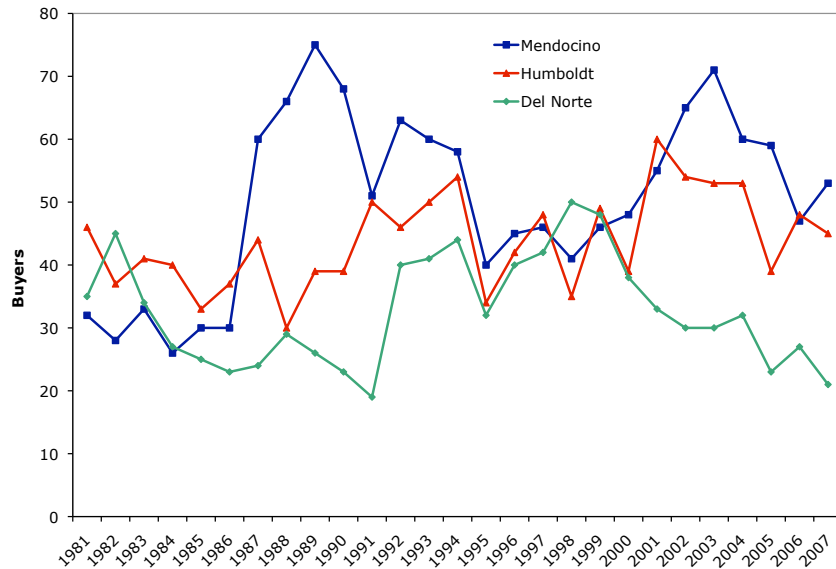


Figure 28. Number of commercial fish buyers, by county, 1981–2007. Note: Numbers are not additive across counties, as some buyers may receive fish in multiple counties.

The number of buyers tends to be higher in line and pot fisheries and lower in trawl fisheries (Table 29). For eight of the nine major North Coast fisheries, a modest proportion of all California buyers receive landings at North Coast ports, the notable exception being whiting.

Table 29. Long-term (1981–2007) and recent (2003–2007) average annual number of buyers in Mendocino, Humboldt and Del Norte counties, and tri-county sum relative to total California buyers, by fishery. Notes: Bold, italicized numbers denote fisheries involving at least 10% of total buyers participating in that county and period. Total number of buyers in each county and period is less than sum of buyers participating in each fishery, as some buyers participate in multiple fisheries; tri-county totals are less than sum of buyers receiving fish in each county, as some buyers receive fish in multiple counties. Blanks denote counties and periods when more than zero and fewer than three boats or buyers participated.

Fishery	Mendocino County		Humboldt County		Del Norte County		Tri-County Total		Tri-County as % of CA	
	1981–2007	2003–2007	1981–2007	2003–2007	1981–2007	2003–2007	1981–2007	2003–2007	1981–2007	2003–2007
	Avg	Avg	Avg	Avg	Avg	Avg	Avg	Avg	Avg	Avg
Crab pot	15	21	25	29	20	21	49	58	23	21
Groundfish trawl	6	3	5	2	7	2	14	4	16	7
Salmon troll	24	39	15	14	7	4	39	48	18	23
Sablefish H&L	5	5	6	3	5	4	12	9	21	16
Albacore troll	7	7	10	11	9	9	23	23	23	26
Rockfish H&L	19	15	18	14	14	8	42	33	15	16
Urchin dive	10	4	1		1		10	4	18	7
Whiting trawl		0	1		1		3	2	82	63
Shrimp trawl	2		4		6		9	2	13	5
Total	50	58	44	48	33	27	103	108	14	15

NORTH COAST RECREATIONAL FISHERIES

Ocean recreational fisheries along the North Coast include salmon, groundfish, albacore, halibut, abalone and crab. Salmon and groundfish, which were traditionally the major target species, have become much less available for harvest over the past few decades. Until recently, Klamath River fall Chinook was the constraining stock in the ocean salmon fishery, prompting much more restrictive regulations in the KMZ (Humboldt and Del Norte counties) than in Mendocino County. Since 2007, however, conservation concerns regarding Sacramento River fall Chinook have prompted unprecedented recreational season reductions and closures statewide. Over the past decade, fishery managers have implemented substantial reductions in groundfish bag limits, seasons and areas that have constrained harvest opportunities throughout the North Coast (as elsewhere in the state).

Effort estimates from the California Recreational Fisheries Survey (CRFS) are available at the ‘district’ level. Estimates for two of these districts – Wine (which covers Mendocino County) and Redwood (which covers Humboldt and Del Norte counties) – together characterize North Coast recreational fishing activity.²⁴

From 2005 through 2007, an annual average of 216,000 recreational angler trips were made on the North Coast (Table 30). The distribution of these trips across modes was 26% manmade, 29% beach/bank, 9% commercial passenger fishing vessel (CPFV, or charter), and 36% private/rental boat. About 66% of North Coast trips occur in Humboldt and Del Norte counties (Redwood District), with the Redwood share varying by mode: 86% for manmade, 73% for beach/bank, 21% for CPFV, and 57% for private/rental boat.

Table 30. Number of ocean recreational angler trips (in thousands) on the North Coast, by district and fishing mode, 2005–2007 (Recreational Fisheries Information Network (RecFIN) website).²⁵

Wine (Mendocino County)					
	Manmade	Beach/bank	CPFV	Private/rental	Total
2005	7	14	35	42	98
2006	5	13	4	29	51
2007	13	23	6	27	69
Average	8	17	15	33	73
Redwood (Humboldt, Del Norte counties)					
	Manmade	Beach/bank	CPFV	Private/rental	Total
2005	53	43	3	42	141
2006	52	58	5	46	161
2007	43	36	5	44	128
Average	49	46	4	44	143
Total North Coast					
	Manmade	Beach/bank	CPFV	Private/rental	Total
2005	60	57	38	84	239
2006	57	71	9	75	212
2007	56	59	11	71	197
Average	57	63	19	77	216

While the CRFS provides a comprehensive overview of North Coast recreational fisheries, it is a fairly new survey and thus does not provide a lengthy time series of fishing activity. Three additional data sources were used to obtain insights into long-term recreational trends: (1) salmon recreational data (for CPFV and private boat modes) collected by CDFG and published by the PFMC; (2) CPFV (commercial passenger fishing vessel, or charter) logbook data; and (3) field data collected for this project. While the salmon and CPFV data provide an incomplete view of the recreational fishery, they are nevertheless informative regarding the sectors they cover.

The Salmon Fishery

Recreational salmon effort and harvest on the North Coast peaked in the late 1980s and early 1990s (Figure 29), then declined to levels that have generally persisted through 2007. Effort and harvest, which averaged 74,500 trips and 59,600 fish from 1981 through 1991, fell to 42,600 trips and 30,700 fish from 1992 through 2007. Several events in the early 1990s contributing to this decline include: (1) PFMC designation of Klamath fall Chinook as overfished in 1993 (PFMC 1994); (2) 1993 re-allocation of Klamath-Trinity River salmon from previous 30/70 tribal/nontribal allocation to new 50/50 allocation; (3) stringent restrictions on coho retention beginning in 1994, due to conservation concerns regarding Oregon Coastal Natural coho.

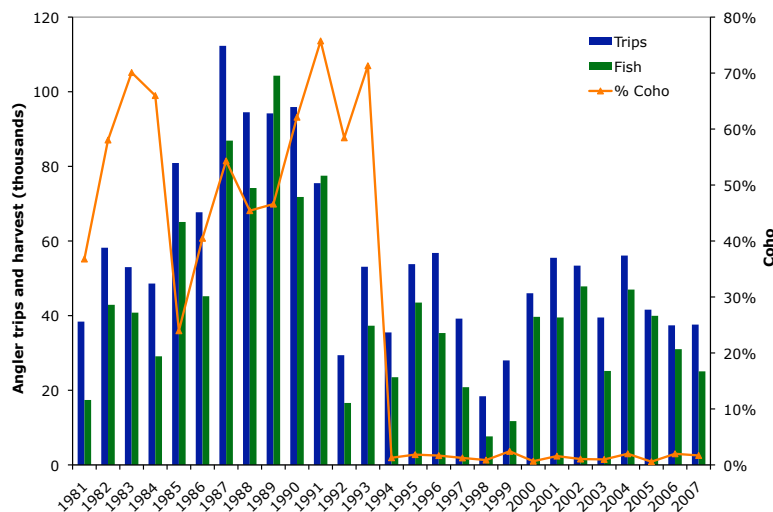


Figure 29. Effort (angler trips) and harvest (number of fish) in the North Coast recreational salmon fishery, and percent of harvest consisting of coho, 1981–2007 (PFMC).

The decline in recreational salmon opportunities experienced since the early 1990s was largely felt in California’s KMZ (Humboldt and Del Norte counties). Salmon statistics for the Eureka and Crescent City areas, which closely correspond to those two counties, indicate much lower effort since 1992 (Figure 30). This is particularly true for the Crescent City area, which is more geographically isolated than Eureka. By contrast, the Fort Bragg area, which is south of the KMZ (Mendocino County) and much less constrained than the KMZ fishery, experienced generally higher levels of effort after 1992 – at least until 2008. In 2008, major concerns regarding the status of Sacramento River fall Chinook resulted in a dramatic and unprecedented shortening of recreational seasons statewide. The recreational season in California’s KMZ was zero days in 2008 and ten days in 2009. The Fort

Bragg recreational season was 45 days in 2008 (significantly reduced from its normal eight to nine months) and zero days in 2009. While such severe restrictions were not new for the KMZ, they were unprecedented for the Fort Bragg area.

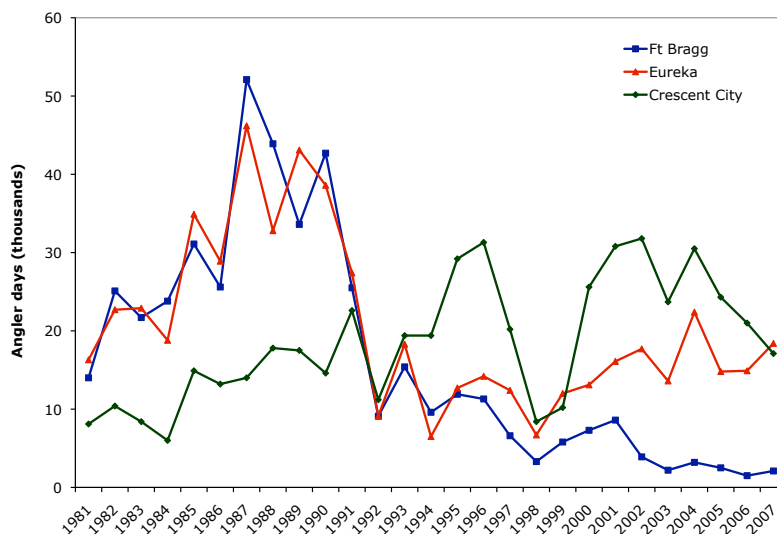


Figure 30. Salmon angler days, by area, 1981–2007 (PFMC).

The proportion of North Coast salmon angler trips made from CPFVs ranged from 6% to 11% from 1980 through 1997, then increased to 10%–24% from 1998 through 2007. The CPFV contribution to salmon effort is consistently lowest in the Crescent City area and highest in the Fort Bragg area (Figure 31). The overall increase in CPFV activity since the late 1990s is driven largely by the growing influence of Fort Bragg on North Coast recreational activity.

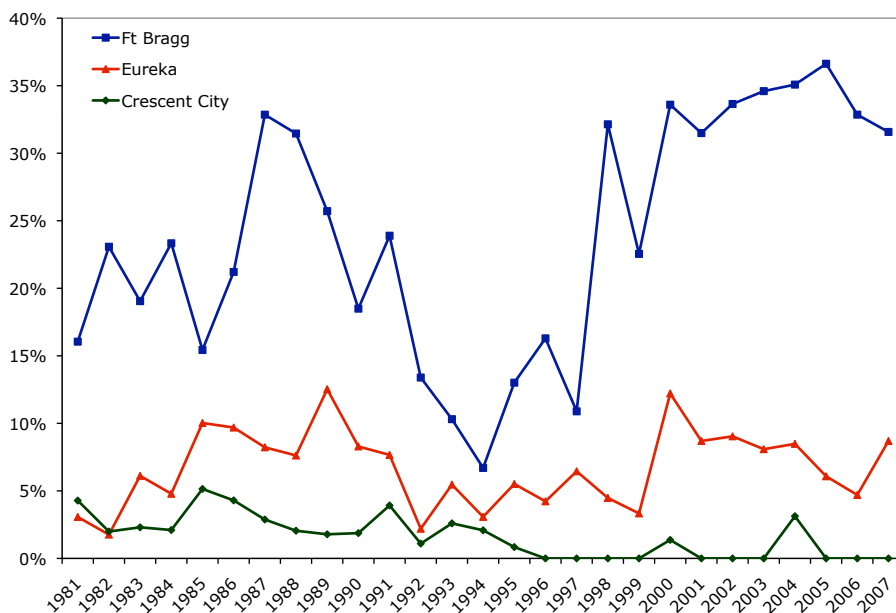


Figure 31. Percent of salmon angler trips in CPFV mode, by area, 1981–2007 (PFMC).

The CPFV Fishery

According to the CRFS (see Table 30), CPFV activity on the North Coast is quite modest relative to activity in other modes. A small but increasing fraction of recreational boat-based salmon activity on the North Coast (averaging 22% since 2000) occurs from CPFVs. To get a better sense of overall CPFV activity on the North Coast (nonsalmon as well as salmon), CPFV logbook data were summarized back to 1980. The trends described here must be viewed with caution, as compliance of CPFV operators with the logbook requirement has not necessarily been consistent across years.

According to logbook data, CPFV activity on the North Coast increased to a peak of almost 16,000 angler days in 1989, declined through the 1990s, but then resumed its upward climb to a new peak of almost 17,000 in 2004 (Figure 32). While the number of angler days increased markedly through the 2000s, the number of CPFVs did not, indicating an increase in angler days per vessel.

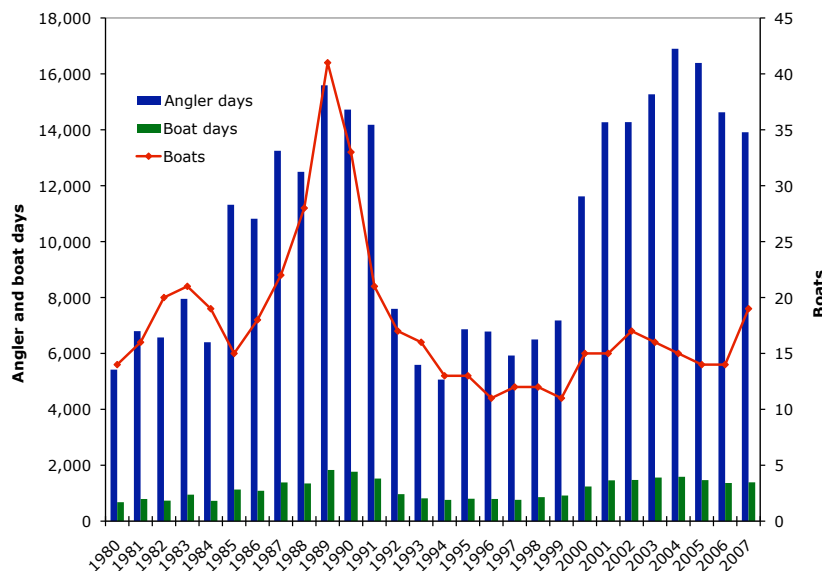


Figure 32. Angler days, boat days and number of CPFVs in North Coast counties, 1980–2007 (CPFV logbook data).

According to the logbooks, CPFV activity on the North Coast tends to be highest in Mendocino County and lowest in Del Norte County (Table 31). This pattern is consistent with previously described information on the recreational salmon fishery.

Table 31. Annual average number of CPFV boats, boat days and angler days in Mendocino, Humboldt and Del Norte counties, 1980–2007 and 2003–2007, by county and overall.

	Mendocino County	Humboldt County	Del Norte County	Total
Boats				
1980–2007 Avg	9	7	2	18
2003–2007Avg	8	7	1	16
Boat days				
1980–2007 Avg	677	365	108	1,149
2003–2007Avg	1,028	422	24	1,474
Angler days				
1980–2007 Avg	7,255	2,361	895	10,510
2003–2007Avg	12,919	2,271	230	15,419

Private Boat Fishing Activity

Private boats are the dominant mode of recreational fishing on the North Coast. Private boat anglers target a diversity of species including salmon and groundfish, and to a lesser extent halibut, albacore, abalone and crab. When salmon availability is low, private boat anglers rely more on groundfish – especially rockfish and lingcod – in the nearshore ocean fishery. However, since the late 1990s, groundfish fishing opportunities have become increasingly constrained by regulations. The long-term effects of such changes on private boat activity are difficult to quantify, as consistent long-term data on private boat effort and catch are not available (except for salmon).

SUMMARY

North Coast commercial and recreational fisheries have changed markedly over the past three decades. Expansion through the 1970s and early 1980s was followed by contraction as regulatory, economic and other factors played out during the 1990s and into the 2000s. Reduced fishing opportunities have increased economic stress and uncertainty for fishery participants, support businesses and the larger community. Communities are now faced with the challenge of maintaining the viability of their fisheries in the face of such constraints. Decisions and plans are being made at the community level regarding infrastructure and other issues to help address this challenge. These adaptations, which are specific to each community, are discussed in the individual port profiles.

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ENDNOTES

- ¹ See http://www.dfg.ca.gov/marine/status/ca_comm_fishing_gear.pdf (accessed 7/30/10) and <http://montereybay.noaa.gov/research/techreports/fisherytrends.pdf> (pp.15–17, accessed 7/30/10) for descriptions of these fisheries and gear.
- ² The percentage of boats and buyers participating in each fishery sum to greater than 100%, as some boats and buyers participate in multiple fisheries.
- ³ Tribal and recreational shore-based, inland and river fisheries, clamming and other marine resource collecting, and aquaculture also are important to the region and its communities, but are beyond the scope of this project.
- ⁴ See <http://ceo.ucsd.edu/fishbull/>, accessed 10/28/09.
- ⁵ See Appendix C for methodological detail related to the CBP data series.
- ⁶ For California as a whole, the industries accounting for at least 10% of business activity on the basis of at least one of the four measures are: manufacturing, retail trade, finance and insurance, professional/scientific/technical services, health care/social assistance, and accommodation/food services.
- ⁷ See Appendix C for methodological detail related to Nonemployer Statistics.
- ⁸ The series includes the agriculture, forestry, fishing and hunting industry, with the exception of crop and animal production.
- ⁹ Earnings by place of work is defined as “the sum of wage and salary disbursements, supplements to wages and salaries, and proprietors’ income” (http://faq.bea.gov/cgi-bin/bean/cfg/php/enduser/std_adp.php?p_faaid=460&p_created=1199992274).
- ¹⁰ Regulations have generally been more restrictive in the California KMZ than the Oregon KMZ, reflecting somewhat different state policies regarding how much fishing opportunity to forego in the KMZ to maintain opportunity in other areas.
- ¹¹ In Oregon (and Washington), the coho nonretention policy was replaced in 1998 by a coho mark-selective fishery, which allowed the retention of hatchery coho (which were marked), and prohibited the retention of wild (unmarked) coho.
- ¹² The tribal allocation was upheld in *Parravano v. Babbitt*, 70 F.3d 539 (9th Cir. 1995), cert. denied, 518 US. 1016 (1996).
- ¹³ The need for such measures was reinforced by provisions of the 1996 reauthorization of the MSA (also known as the Sustainable Fisheries Act) that prohibited harvests from exceeding MSY, required the use of specific thresholds for determining whether a stock is overfished, and required rebuilding plans for overfished stocks.
- ¹⁴ Pacific ocean perch, bocaccio and lingcod were declared overfished in 1999, canary rockfish and cowcod in 2000; darkblotched and widow rockfish in 2001; and yelloweye rockfish in 2002. Lingcod was declared rebuilt in 2005.

- ¹⁵ Large footropes are used to attach large rollers to bottom trawl gear to facilitate their use in rocky areas. Restrictions on use of large footropes increase the likelihood of damage to trawl gear in rocky areas inhabited by overfished rockfishes and thus discourage trawlers from operating in those areas.
- ¹⁶ The boundaries of the RCAs vary by gear type (trawl, nontrawl) and among years and seasons. These variations are intended to minimize bycatch of overfished species while also providing opportunities to take healthier stocks that may become available to the fishery in certain areas and seasons.
- ¹⁷ Under permit stacking, groundfish vessels with permits that were ‘endorsed’ to harvest sablefish were assigned to one of three tiers (based on their historical landings) that determined the vessel’s share of the total sablefish quota during the year. These vessels were allowed to transfer their permits (and the sablefish harvest share allowed under the permit) to another eligible vessel, up to a limit of three permits per boat. Permit stacking gave vessels some flexibility to adjust their harvest share and to time their harvest to weather and market conditions. Prior to permit stacking, open competition among vessels for the limited quota resulted in short seasons and unsafe conditions at sea, with vessels taking safety risks to maximize their share of the overall quota before it was exhausted.
- ¹⁸ The groundfish trawl buyback also retired participating vessels’ shrimp trawl and crab permits.
- ¹⁹ Implementation of the trawl individual quota program in 2011 will require 100% observer coverage for that sector.
- ²⁰ The number of nearshore permits issued by the California Department of Fish and Game (CDFG) for the North Coast and North-Central Coast regions combined, which extends from the Oregon border to Pigeon Point, declined from 65 in 2003 to 35 in 2010 (http://www.dfg.ca.gov/licensing/pdffiles/cf_items_10yr.pdf, accessed 6/1/10).
- ²¹ The 1981 start date for this analysis is based on the availability of data from the Pacific States Marine Fisheries Commission’s (PSMFC) PacFIN database, which integrates Washington, Oregon and California commercial fishery landings data to provide a consistent coastwide electronic record of landings from 1981 forward. The PacFIN data for California are based on the CMASTR data provided by CDFG to the PacFIN program.
- ²² For species like salmon, which are gutted at sea, landed weights were converted to round weights to provide comparability with other species.
- ²³ Because the crab season straddles the calendar year (December through July) and most landings occur within the first to two months of the season (Hackett et al. 2003), the activity as reported for a given year does not correspond to that of a season. We analyzed the data by calendar year for consistency with analyses for other fisheries, most of which have seasons that lie within the calendar year.
- ²⁴ Initiated by the state in 2004, the CRFS provides comprehensive estimates of effort and catch for all recreational fishing modes and species. (Modes are the locations/facilities anglers fish from, and include: ‘manmade’ structures, beaches and banks, CPFVs (or charter boats), and private boats.)
- ²⁵ <http://www.recfin.org>, accessed 7/30/10.

Crescent City Fishing Community Profile



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EXECUTIVE SUMMARY

Background

National Standard 8 of the Magnuson-Stevens Fishery Conservation and Management Act requires that fishery managers consider the importance of fishery resources to fishing communities, to provide for their sustained participation and to minimize adverse economic impacts on them, consistent with conservation objectives. Similarly, California's Marine Life Management Act mandates the use of socioeconomic as well as biophysical Essential Fishery Information to meet fishery management goals. Information on how individual fisheries and port communities operate is important to meeting these mandates. Yet, such social science information on Northern California port communities has been sparse until recently.

This profile of the Crescent City fishing community describes the history of the area and its fisheries, present-day fishery operations, activities and associated infrastructure. It identifies key regulatory and economic factors highlighted by study participants that interact with and affect the local fishing community. It is intended for use in a range of processes, from local planning and education to state and regional management.

The information presented is based on the collection and integrated analysis of archival and field data to interpret patterns, variability and change within and across fisheries and the fishing community over time. Data sources include:

- Commercial fish landing receipt data for 1981–2007 reconfigured into 34 distinct species/gear combinations;
- Commercial Passenger Fishing Vessel (CPFV) logbook data for 1980–2007;

- An extensive review of the published and gray literature, including fishery status reports and historical fishery statistics (as available); and
- Field observation and interviews and group meetings with about 50 fishery participants and other knowledgeable individuals.

History of the Crescent City Fishing Community

Located 350 miles north of San Francisco and 20 miles south of the Oregon border, Crescent City Harbor is situated near some of the West Coast's most productive fishing grounds for salmon, groundfish, crab and shrimp. People living in this isolated part of the state have long utilized fishery resources for livelihood, sport and subsistence. Once home to the Tolowa and Yurok peoples, Crescent City became a hub for the gold mining, whaling and timber industries in the mid-1800s. The timber and fishing industries grew through the 1900s. In 1950, locals built Citizens Dock to support local fishing activity. In 1964 a devastating tsunami took 11 lives and destroyed most of the town and the docks. Relief funds from that natural disaster promoted the redevelopment of the harbor through the construction of a boat basin, offloading docks, and two large processing plants. By the early 1970s, Crescent City Harbor was a 'state-of-the-art' fishing port, well positioned to support expansion of commercial and recreational fisheries.

By the late 1970s and 1980s, growing concerns about the status of West Coast salmon and groundfish stocks prompted the Pacific Fishery Management Council (PFMC) and the state of California to implement increasingly stringent management measures for the commercial and recreational fisheries. Cumulatively, these measures have discouraged (nontribal) fishing

along much of the North Coast, resulting in substantial reductions in both commercial and recreational fishing activity, and contributing to social and economic impacts in the area.

The Crescent City Fishing Community Today

Crescent City's primary commercial fisheries include the Dungeness crab pot, groundfish and shrimp trawl, groundfish hook-and-line and coonstripe shrimp trap fisheries. The brief whiting trawl season involves a small number of nonresident vessels. Some resident fishermen travel north into Oregon or south (as far as San Francisco) to participate in troll fisheries for Chinook salmon and/or albacore tuna. Of the approximately 100 vessels homeported at Crescent City, 85–90 are described by locals as crabber/trollers, 12 are nearshore fishermen, and five are groundfish/shrimp trawlers. Most fishermen participate in more than one fishery, and more than 75% have participated in the crab fishery.

Local fish receiving and processing capacity consists of six buyers with receiving stations at the harbor and one onsite receiver/processor, Alber Seafoods, Inc. Alber processes some crab and groundfish onsite; however, most of the catch is shipped out of the area for processing as well as distribution. Some buyers and fishermen (through off-the-boat and other direct sales) sell small amounts of crab, groundfish and albacore seasonally. All of the coonstripe shrimp catch is sold through the live market in the San Francisco Bay area.

Following the reduction in recreational salmon fishing opportunities beginning in the early 1990s and the more recent influence of economic factors, participation in ocean recreational fishing at Crescent City has declined. Today, the most avid Crescent City anglers still pursue an annual round of fisheries that includes salmon (when the season is open), albacore in late summer (when it is

within range), crab in winter, and rockfish year-round (subject to closure when quotas have been reached). Private boat fishing continues to be the primary recreational fishing mode, although up to two six-passenger charters also operate at the port.

The harbor district and approximately 20 businesses at or near the harbor (and more in the larger region) provide considerable infrastructure, goods and services to support these activities. Harbor infrastructure includes 15 acres of dock, pier and boat slip facilities, two commercial fish processing facilities (one currently in operation), several small receiving stations, an ice plant, a fuel dock, a wastewater treatment plant, an indoor vessel repair facility, retail spaces, a storage yard, launch ramps, and equipment such as a Travelift and hoists.

Commercial Fishing Activity Highlights

Relative to the *long term* (1981–2007), average annual total fishing activity has decreased in *recent years* (2003–2007) in terms of landings (-44%), ex-vessel value (-4%), boats (-57%), trips (-48%) and buyers (-15%).

- The crab fishery, which accounted for an annual average of 43% of landings and 45% of ex-vessel value between 1947 and 1980, has become the dominant fishery at Crescent City, accounting for 64% of landings and 83% of ex-vessel value in recent years.
- Although the groundfish trawl fishery has long been integral to the port, average annual landings and ex-vessel value and numbers of boats, trips and buyers are all 70%–79% lower in recent years relative to the long term.
- Salmon historically played a substantial role at the port, accounting for an annual average of 12% of landings and 31% of ex-vessel value for the period 1947 through 1980, and involving up to 84%

of boats into the early 1980s. However, in recent years the number of boats and trips declined by 78% and 92% relative to the long term, while landings, ex-vessel value and the number of buyers declined by over 40%. This decline was largely underway in the early 1980s, due to the limited entry program and highly restrictive regulations in the Klamath Management Zone (KMZ). Whereas some salmon fishing occurs locally (as regulations permit), local fishermen who choose to participate in the fishery travel to areas with greater fishing opportunities to fish and deliver their catch.

- Landings in the pink shrimp trawl fishery peaked in 1992 at 17.2 million pounds, with an ex-vessel value of \$7.8 million. Landings, value, boats, trips and buyers all declined steadily and substantially (by 83%–98%) in recent years relative to the long term due to market, infrastructure and other factors.
- A small hook-and-line fishery for rockfish and lingcod accounted on average for 1%–5% of landings and ex-vessel value during the period 1981–2007, with an average of 23% of boats participating in that fishery.
- The coonstripe shrimp fishery, started by local fishermen in the early 1990s, remains a relatively small fishery in terms of landings, value and fishing effort. Landings peaked in 2000 at just over 81,000 pounds worth \$396,600.

Total ex-vessel value (for all fisheries) peaked at \$24.7 million in 1988, while landings peaked at 39.3 million pounds in 1992. In both cases, the shrimp trawl fishery accounted for a plurality (38% and 44%, respectively) of the activity. In 2007, 8.2 million pounds worth \$12.2 million was landed at the port, with crab accounting for 81% of landings and 52% of value.

The number of boats peaked in 1981, when 1,082 boats made 14,494 deliveries, 53% of which were salmon and 25% of which were crab. Vessel participation was lowest in 2005, when 137 boats made 3,178 deliveries, 3% of which were salmon and 54% of which were crab. In 2007, 157 boats made deliveries, 67% of which were crab.

Of the 20 buyers that received fish at Crescent City in 2007, three accounted for just over 55% of the landed value of the catch, five accounted for 75% and seven accounted for 90%. The 20 buyers include several fishermen who market at least some of their catch directly to retailers and/or consumers.

Average annual prices were lower in recent years relative to the long term in the shrimp trawl (-33%), whiting (-13%), albacore (-21%), crab (-11%) and shrimp pot (-7%) fisheries, but higher in the rockfish hook-and-line (+82%), salmon (+13%), and groundfish trawl (+5%) fisheries.

The number of ‘Crescent City boats’ (i.e., those with a plurality of their ex-vessel revenue at Crescent City) declined from an average of 516 per year from 1981 through 1983 to 82 from 2005 through 2007, while average revenue per boat increased from \$37,799 to \$141,067. When boats were assigned to their primary fishery (the fishery accounting for the plurality of each vessel’s landed value), this trend was apparent in most fisheries, most notably rockfish, salmon and crab. It is not clear, however, how these increases in revenue per boat compare to costs, which also have increased over time.

Recreational Fishing Activity

Recreational fishery data specific to Crescent City are limited.

- According to the California Department of Fish and Game (CDFG) Recreational Fisheries Survey (CRFS), which provides data on fishing activity at the ‘district’ level, an annual average of 143,000 angler trips were made in the Redwood District (which comprises Del Norte and Humboldt counties) between 2005 and 2007. About 31% of these trips were from private boats, and 3% from charter boats.
- Data from CDFG’s Ocean Salmon Project for the Crescent City area indicate an 86% decline in salmon angler trips (charter and private boats) from 1981 to 2007. Private boat trips accounted for more than 98% of salmon effort both over the long term and in recent years.

Key Factors Affecting Crescent City Harbor Fisheries

Historic events: The 1964 tsunami fundamentally changed the course of history for Crescent City and its fishing community. The devastation evoked national sympathy and catalyzed the community, paving the way for it to obtain federal funding to build a state-of-the-art fishing harbor. In a relatively short time, Crescent City’s fishery-support infrastructure was significantly improved and, together with various federal programs, provided one of many incentives at that time for local fishery expansion.

Salmon fishery management: Dramatic reductions in (and at times, closures of) commercial seasons by the PFMC as well as the state’s limited entry program, implemented in the early 1980s, led to a sharp decline in the commercial salmon fleet. Effort was displaced into other fisheries such as groundfish and

crab. Reduced allocations to nontribal fisheries in the early 1990s led to further reductions in fishing opportunities, this time for the recreational sector, and sharply curtailed the seasonal influx of summer fishermen and the associated economic activity on which many local businesses such as smokehouses, tackle shops, grocers and RV parks depended.

Groundfish fishery management:

Increasingly strict federal catch limits since the 1990s, together with the 2003 federal groundfish trawl buyback and the state’s implementation of restricted access in the Nearshore Fishery, have limited commercial fishery participation. Of 17 resident groundfish trawlers, 16 participated in the 2003 groundfish trawl buyback. Their removal from the local fleet led to a marked reduction in local fishery activity, including seafood processing and the use of fuel, ice and other support services. Recent time and area closures to protect yelloweye rockfish, coupled with the 2008 salmon closure and the limited (10-day) 2009 salmon season, eliminated many local recreational fishing opportunities, further straining local support businesses and negatively affected the community’s sense of well-being.

Economics: Commercial fishery participants and support businesses cited rising operating costs, especially those for gear, vessel maintenance, insurance and fuel, as among the biggest challenges they are facing. At the same time, many commercial fishermen commented on stagnant or declining prices in several fisheries. Increasing costs and less favorable economic conditions also have affected fishery-support businesses, both directly and indirectly. The reduction in fishing opportunities and activity has resulted in reduced demand for goods and services that these businesses provide.

Harbor Infrastructure: As fishing activity has declined over the last 30 years, so has the harbor's revenue base. Insufficient provision for basic maintenance and repair of docks and related infrastructure has led to their disrepair and vulnerability to events such as the 2006 tsunami. These and other costs, particularly for dredging and dredge material disposal, and maintaining and operating the wastewater treatment plant, have become significant.

Local processing of seafood is limited, due in part to the high cost of using the harbor's wastewater treatment plant, which is required for fish processing. This factor contributed to the closure of two local processing facilities, as well as the harbor, in the past decade, and has continued to be an issue for current and prospective processors. The reduction in landings in key fisheries coupled with increasing transportation costs have led to regional consolidation of processing facilities. Finally, Crescent City's small local population, many of whom fish recreationally for their own catch, creates limited demand for local processing and seafood retail.

Current Situation and Outlook

The Crescent City Harbor fishing community has become particularly dependent on the commercial crab fishery, as activity in several other key fisheries has been sharply curtailed. Recreational fisheries now engage perhaps a tenth the number of anglers they did in the 1980s, focusing on groundfish and crab rather than salmon, which is still highly valued but restricted.

The reduction in fishing opportunities and activity have reduced shoreside activity, leading businesses to close, reduce services and/or inventory, or diversify their operations. With limited alternative sources of revenue, harbor infrastructure has deteriorated. In addition, the Marine Life Protection Act process begun in late 2009 in the North Coast Region, and an individual quota program for the federal groundfish trawl fishery, have the potential to fundamentally change local fisheries and the community.

Yet the Crescent City community has a well-established history of adapting to change that may enable it to meet these challenges. Community members have a history of working together to support the harbor and its fisheries. Recently, funds have been secured to begin much-needed dredging of the harbor's main navigation channel, and additional funds to support reconstruction of the inner basin and other improvements are pending. These efforts together with the port's location near rich fishing grounds, its safe and easy access, and the availability of key services create the potential for Crescent City to regain its resilience and vitality as a fishing port.

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Cover photo by C. Pomeroy.



INTRODUCTION

Crescent City Harbor, California's northernmost harbor, historically has been one of the state's most active fishing ports. Located 350 miles north of San Francisco and 20 miles south of the Oregon border (Figure 1), it is situated near some of the West Coast's most productive fishing grounds for groundfish, salmon, crab, and shrimp. People living in this isolated part of the state have long utilized fishery resources for livelihood, sport and subsistence. Community initiative led to the construction of Citizens Dock in 1950 and, following a destructive tsunami in 1964, the development of Crescent City Harbor as a state-of-the-art fishing port by the mid-1970s.

Crescent City fisheries are subject to environmental conditions and events that affect both fishing and fishery-support activities. NOAA's National Weather Service has noted that the area from Eureka north, including Crescent City, is uniquely positioned to experience some of the worst and most dangerous winter storms and summer fog associated with coastal upwelling. These conditions are often an important limiting factor for fishing. Nonetheless, many fishermen consider Crescent City harbor the safest and

most accessible on the West Coast north of San Francisco, both because it lacks a bar at the harbor entrance (a notable drawback of Humboldt Bay and Fort Bragg) and affords protection from storms.

Crescent City is Del Norte County's only incorporated city and the county seat. About 30% of the County's approximately 26,000 residents live within the city.¹ A significant portion of the county's 1,070 square miles is owned and managed by state and federal government, and include portions of Redwood National Park, various state parks and the Pelican Bay State Prison, which opened in 1989. According to the Bureau of Economic Analysis, the government sector accounted for 47% of earnings in the county in 2007, three times the proportion for the state as a whole.

This profile of the Crescent City Harbor fishing community provides a brief history of the harbor and its fisheries; a detailed description of present-day fishery operations, activities and associated infrastructure; and discusses some of the key regulatory, economic and



Figure 1. California map locating Crescent City and aerial view of Crescent City Harbor.

other factors highlighted by study participants that interact with and affect the local fishing community.²

The information presented is based on archival and field research conducted between July 2007 and March 2009.³ Fieldwork included observation, informal and formal interviews and group meetings. These activities engaged approximately 50 people, including 20 local commercial and recreational fishermen, 10 fish buyers, owners and/or employees of 10 fishery-support businesses, the harbormaster and staff, as well as other community members who have experience and knowledge of local fisheries. Field data were analyzed together with commercial fishery landings data⁴, and information from other primary and secondary sources to interpret patterns, variability and change within and across fisheries and the fishing community over time.

History of the Port and the Surrounding Area

Named after its crescent-shaped beach, Crescent City was settled in the 1850s following the discovery of gold on the Trinity River. Mining along with logging, farming and fishing opportunities soon brought thousands of new settlers to the area, which at that time was inhabited by the native Tolowa and Yurok peoples. Conflicts arose as more settlers arrived and acquired land (often by force from the native people), eventually leading to the Red Cap War in 1856 and the removal of several tribes to the Hoopa Valley Indian Reservation (Norman et al. 2007).

The town of Crescent City was incorporated in 1854, and its natural harbor (the only one between Humboldt Bay, California and Coos Bay, Oregon) became a key port of entry and supply center for settlers. The Crescent City Whaling Company was established in 1855 (Starks 1923) but was short-lived (Bertão

2006). However, offshore whaling operations continued at Crescent City until 1894. In the late 1880s, the Battery Point Lighthouse (located on the mainland) and St. George Reef Lighthouse (located eight miles offshore) were built to help mariners navigate the treacherous coastal waters (Scofield 1954).⁵

Road transportation began with the construction of the county's first plank road in 1858; the Redwood Highway between Eureka and Crescent City opened in 1923 (Pierce 1998). The first local railroad opened in the early 1900s, primarily to transport lumber from nearby Smith River to Crescent City for shipment to the growing San Francisco Bay area and beyond (McEvoy 1986).

As the gold rush slowed in the late 1800s, residents turned to other natural resources in the area, massive redwood forests and abundant fishery resources such as salmon, groundfish and crab. Timber harvesting was the primary industry for many decades, particularly during the post-World War II U.S. housing boom. However, by the 1960s, an estimated 90% of the redwoods were gone (Norman et al. 2007). As logging declined, fisheries became an increasingly important industry in this sparsely populated coastal community.

On March 28, 1964, a 9.2 magnitude earthquake off Alaska caused a tsunami that destroyed much of the town and harbor, badly damaged Citizens Dock, and resulted in 11 deaths. (A 1,000-year storm in December 1964 exacerbated the damage.) However, this disaster enabled the city and the harbor district to acquire state and federal emergency relief and other funds to develop the harbor (RRM Design Group 2006). The boat basin opened in 1968, and the development of associated harbor infrastructure including offloading docks, fish processing and boat-building facilities continued into the 1970s.

Crescent City Harbor Fishing Community Timeline

1800s	Local tribes' first contact with European-Americans
1850	Gold discovered on Trinity River
1854	Crescent City incorporated
1892	Point St. George Lighthouse built
1923	Redwood Highway between Crescent City and Eureka completed
1935	Crescent City Harbor District established
1950	Citizen's Dock built
1964	Tsunami devastates harbor and town
1970	Two processing plants and Del Norte Ice plants open
1973	Inner boat basin completed
1974	Boldt decision
1976	Magnuson-Stevens Fishery Conservation and Management Act (MSA)
1977	Fashion Blacksmith opens at harbor
1979	Klamath Management Zone (KMZ) established
1980	Englund Marine opens
1982	Salmon limited entry
1982-83	El Niño
1985	KMZ commercial salmon fishery closure
1987	Ice plant opens on Citizen's Dock
1991	KMZ recreational salmon fishery closure
1992	Wastewater Treatment Plant (WTP) opens KMZ recreational salmon fishery limited to 14 days Dungeness crab fishery moratorium on entry
1993	Salmon re-allocation to tribes (50%) Coho retention prohibited in commercial fishery
1994	Groundfish limited entry Salmon disaster Coho retention prohibited in KMZ recreational fishery Del Norte Ice ceases operations
1995	Dungeness crab limited entry
1996	Sustainable Fisheries Act (MSA re-authorized)
1998	Harbor district takes over WTP operations from city Marine Life and Nearshore Fishery Management Acts
1999	Marine Life Protection Act (MLPA)
2000	Sea Products ceases operations Federal groundfish disaster Alber Seafoods begins receiving and processing
2001	Eureka Fisheries ceases operations
2002	Nearshore Fisheries Management Plan (FMP) adopted First federal Rockfish Conservation Area (RCA) established
2003	Groundfish trawl buyback Nearshore fishery restricted access
2006	Tsunami Klamath salmon disaster
2008	Statewide salmon disaster and fishery closure Trawl Individual Quota program approved Northern California shrimp trawl grounds closed
2009	Statewide salmon disaster and fishery closure North Coast MLPA process begins

The Expansion of Commercial and Recreational Fisheries

River fisheries for coho (*Oncorhynchus kisutch*) and Chinook salmon (*O. tshawytscha*) began in the mid-1800s while the ocean salmon fishery, which developed in Monterey Bay in the late 1880s, reached the North Coast in the 1920s (Feinberg and Morgan 1980). Information about fisheries at Crescent City in the latter 1800s is scant; however, interest in developing the harbor to support fishing as well as mining and timber is evident. The first wharf reportedly was built in 1855 at Whaler's Island, but was soon destroyed by heavy seas (Scofield 1954). According to Leidersdorf (1975), the U.S. Army Corps of Engineers first considered improving the harbor for navigation in 1867, but did not recommend such development until 1911. Because the harbor was vulnerable to waves and storm surge, the Corps first built a breakwater, completed in 1930, which afforded protection from westerly waves and surge but not from southerly forces. In addition, it caused shoaling, which led the harbor district (established in 1935) to initiate maintenance dredging. Over the next several years, additional breakwaters and barriers were constructed with varying degrees of success in addressing this problem.

These improvements, along with many technological developments following World War II, stimulated the expansion of commercial and recreational fisheries at Crescent City. Local citizens sought federal assistance for rebuilding the municipal wharf. When none was forthcoming, they donated materials, money and labor to build Citizens Dock, which was completed in 1950 (Leidersdorf 1975, Powers 2005). Around that time, Scofield (1954) reported on fishing activity at four piers at Crescent City, including Citizens Dock:



A recently constructed municipal pier (Citizens Dock) is the receiving point for about 90% of the fishing boats in the harbor. The three fish piers are equipped with hoists, scales and truck roads. There is a modern fish cannery and a crab processing plant. Most of the boats are salmon trollers and crab boats, but there is some set lining and occasional deliveries by trawlers. The town is chiefly a salmon and crab port, but other species landed are sole, lingcod, rockfish, albacore tuna, smelt, sablefish, shark and halibut.

By the late 1950s, Crescent City had four resident commercial fish companies⁶ and a number of fishery-support businesses⁷, and was the site of substantial recreational and commercial fishing activity. Fishing vessels were moored in the lee of Whaler's Island, and most of the commercial fish offloading activities occurred at Citizens Dock. Evidence of this activity was used to obtain a \$250,000 loan from the state's Division of Small Craft Harbors to expand and improve Citizens Dock (Trice 1960).⁸

California Department of Fish and Game (CDFG) Fish Bulletin data provide a measure of this activity beginning in the late 1940s (Figure 2). During the 1950s and 1960s, commercial fishermen in the area landed primarily crab and salmon. The groundfish and shrimp trawl fleets became increasingly active

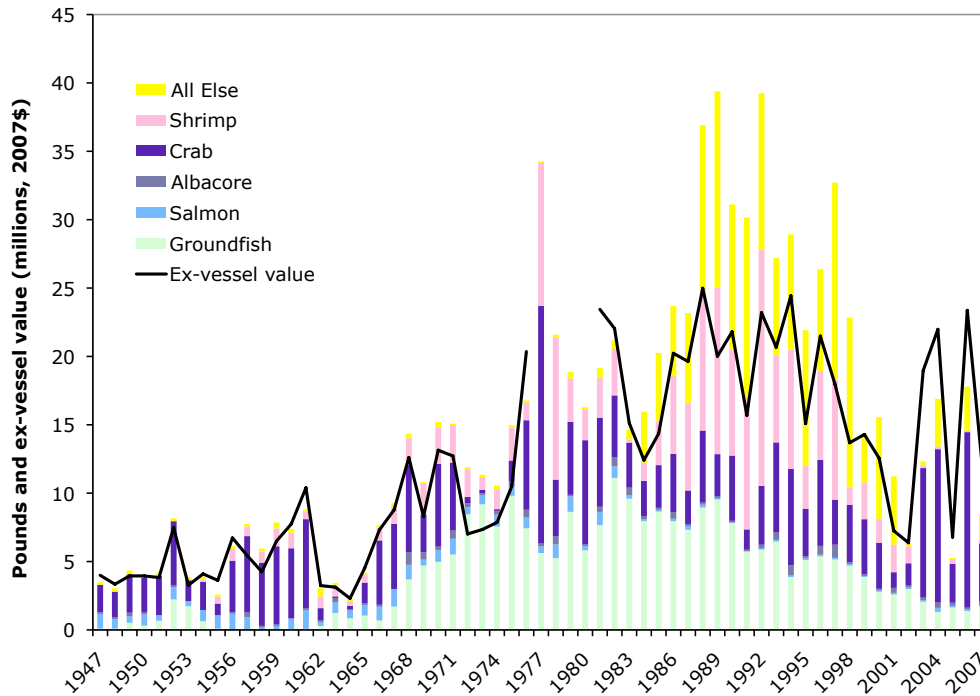


Figure 2. Pounds and ex-vessel value (2007\$) of commercial fishery landings at Crescent City, 1947–2007 (CDFG Fish Bulletin Series). Note: Ex-vessel value data for 1977–1980 are not available.

in the late 1960s and early 1970s (due largely to the use of double-rig trawl nets for shrimp), bringing the total landings at Crescent City to more than 10 million pounds worth \$12.6 million (2007\$) by 1968.

Receiving and processing capacity expanded in the aftermath of the 1964 tsunami with the construction of two large seafood processing plants. When government funds for the project came up \$40,000 short, more than 130 individuals and businesses donated money to ensure the project's success (Anon. 1976). In 1970 the Harbor District leased the buildings to Crescent Fisheries and Eureka Fisheries, the latter one of the largest seafood processing companies along the West Coast at the time. Eureka Fisheries' new 16,000 ft² processing facility was capable of handling some six million pounds of shrimp, crab, salmon and groundfish annually (Eureka Fisheries 1992). The considerable increase in processing capacity (as well as jobs and income for residents) likely encouraged an increase in the amount of fish landed at the port.

The completion of the inner boat basin provided the first secure berthing space for recreational and commercial fishing vessels, and led to a substantial influx of fishermen into the area, which at that time was economically depressed following the sharp decline in the local timber industry. As of May 1975, the inner harbor's 300 berths were fully occupied by permanent tenants, and there was a substantial slip waiting list (Leidersdorf 1975). The resident commercial fishing fleet consisted of 100 to 120 boats, many of which were new or updated vessels compared to those of the previous decade. In addition to the resident fleet, a growing number of transient vessels used the port. In 1981, there were over 1,000 boats making landings at the port, about ten times the number of resident boats. These boats, many from Eureka and points south or from Oregon, came to access the rich local fishing grounds and to take advantage of the harbor's infrastructure, including fish receiving and processing capacity.

As of the late 1970s, recreational fishing in Crescent City involved some 500 boats in seasonal slips and as many as 100 more on moorings in the harbor's outer basin. At that time the recreational fisheries for groundfish and both coho and Chinook salmon were open most of the year, although most fishing occurred during the summer season (May through August). The recreational fleet included out-of-towners as well as locals. Retirees, school teachers and others would trailer their salmon boats to the harbor and stay for weeks or the entire summer to fish.⁹ Many stayed in local RV parks at the harbor and elsewhere in town.

During the 1980s, three receiver/processors (often referred to as 'fish houses') and at least another four buyers were resident at the port. In addition to Crescent Fisheries and Eureka Fisheries, Consolidated Factors/Sea Products received and packed frozen seafood products. Pacific Choice Seafood received and transported seafood to its processing facilities in Eureka. By the end of the decade, there were as many as eight receivers (including processors) operating out of Crescent City, and many more small-scale buyers.

In addition to harbor development, Crescent City's fishing community benefited from various federal programs aimed at encouraging the development of the nation's fisheries. The 1971 reauthorization of the Farm Credit Act enabled commercial fishermen to obtain loans through local Production Credit Associations, which had been making such loans to farmers and ranchers since 1933 (Deweese 1976, NOAA 1999). Additionally, the Capital Construction Fund and Fishing Vessel Obligation Guarantee program (authorized by the Federal Ship Financing Act of 1972) offered low interest or government-backed loans, tax-deferred vessel repair and construction programs, fuel tax relief, gear replacement funds, market expansion programs

and technical assistance (NOAA 1999). These opportunities, collectively referred to by one study participant as a "fleet promotion act," helped to substantially increase fleet size and capacity. For Crescent City, as for many other U.S. fishing communities, the 1970s and 1980s were the boom years, as fisheries expanded through industry, technology, and international trade.

The Expansion of Fishery Management

Commercial Fishery Management

Through the late 1970s, Crescent City fisheries were subject to modest management, and landings were driven largely by resource availability and market demand. With the passage of the federal Fishery Conservation and Management Act (later the MSA) in 1976 and the creation of the Pacific Fishery Management Council (PFMC), as well as increased state fishery management, things began to change. By the early 1980s, the fishing community experienced increasing restrictions in the salmon troll and groundfish trawl fisheries.

In the late 1970s, concern for Klamath River fall run Chinook led the newly formed PFMC to begin restricting seasons and areas of catch through the implementation of a Salmon Fishery Management Plan (FMP). In 1979, to better address concerns regarding fishery impacts on Klamath River fall Chinook, the PFMC established the Klamath Management Zone (KMZ; (Pierce 1998). The area extended from Humbug Mountain near Port Orford, Oregon to Horse Mountain, California, encompassing Crescent City fishermen's primary fishing grounds. In 1982, California adopted a statewide limited entry program for commercial trollers. By 1984, the PFMC had shortened the commercial salmon season in the KMZ to approximately two months, much shorter than the five- to six-month seasons in other areas along the coast. In 1985, the commercial season in the KMZ was closed

completely. These actions reflected the PFMC policy of imposing greater restrictions in areas with greater impacts on Klamath fall Chinook (the KMZ) in lieu of lesser restrictions over a larger geographic area.

Beginning in 1992, the PFMC prohibited retention of coho in the commercial salmon fishery south of Cape Falcon, Oregon due to conservation concerns regarding Oregon Coastal Natural coho (PFMC 1992). This led to fishery disaster declarations for California and Oregon fishing communities in 1994 and 1995. Although the KMZ commercial fishery was not nearly as dependent on coho as fisheries further north, the California KMZ was completely closed from 1992 through 1995, largely due to more localized factors that compounded the effects of the coho nonretention policy. In 1993, Klamath fall Chinook was declared overfished (PFMC 1994), and the Department of Interior Solicitor issued an opinion allocating 50% of Klamath-Trinity River salmon to the Yurok and Hoopa tribes. This was significantly higher than the 30% tribal allocation brokered by the Klamath Fishery Management Council in a previous 1987–1991 agreement, and required reduced allocations to nontribal fisheries, including the KMZ commercial fishery (Pierce 1998).¹⁰ As a result, commercial salmon seasons in the California KMZ have at times been only days or weeks in duration, and in some years completely closed (as occurred in 1985). The cumulative effect of these management actions was to discourage (nontribal) salmon fishing along much of the North Coast, resulting in substantial reductions in both commercial and recreational fishing activity at Crescent City, as elsewhere.

In 2006, failure of Klamath fall Chinook to achieve its escapement floor¹¹ for the third consecutive year triggered a conservation alert and prompted the PFMC to close the commercial fishery in the California KMZ and

curtail the season in other areas. Unusually low escapement of Sacramento River fall Chinook in 2008 and 2009 lead to unprecedented closures of California’s commercial fishery and dramatically curtailed seasons in Oregon. The 2008–2009 closures have been unprecedented for many salmon-dependent communities, though less so for Crescent City, which has been subject to stringent KMZ regulations for more than two decades.

Fishing opportunities also have been curtailed by state and federal management in the West Coast groundfish fishery. In 1982, the PFMC implemented the federal West Coast Groundfish FMP, and began to manage the commercial fishery with measures such as harvest guidelines, trip landing and trip frequency limits, and gear restrictions. However, it wasn’t until 1994 that PFMC implemented a coastwide limited entry program for the trawl and fixed gear (hook-and-line and pot) fisheries, and a small open access fishery for nontrawl fishermen.

In 1992, the PFMC adopted a harvest rate policy for groundfish based on the assumption that West Coast groundfish were similar in productivity to other well-studied groundfish stocks. Over the next eight years, as growing scientific evidence indicated that rockfish (*Sebastes* spp.) had productivity rates much lower than other groundfish species, the PFMC adopted increasingly restrictive management measures for rockfish.¹² However, these measures came too late to reverse the effects of longstanding harvest policies based on inaccurate assumptions, and between 1999 and 2002, eight groundfish stocks were declared overfished.¹³ In 2000, a federal disaster was declared in the West Coast groundfish fishery.

To rebuild overfished stocks, optimum yields (OYs) and trip landing limits for healthy stocks typically taken with the species of concern, as well as those overfished species, were

cut further for both limited entry and open access vessels. To afford fishery participants more flexibility and enable them to reduce discards, trip limits were subsequently replaced with cumulative landing limits that gradually expanded in duration (weekly, biweekly, monthly, bimonthly). The PFMC also implemented rockfish conservation areas (RCAs) to reduce the catch of overfished species (PFMC 2008). Implemented in September 2002, the first federal RCA closed continental shelf and slope waters to commercial groundfish fishing from near Cape Mendocino (north of Fort Bragg) north to the Canadian border. The severe decline in harvest opportunities exacerbated the problem of excess harvest capacity, and led to measures such as the industry-funded federal West Coast groundfish trawl buyback program in 2003. Sixteen of Crescent City's 17 resident groundfish trawl vessels participated in the buyback and were removed from the local fleet, leading to further reductions in local fishery activity. In subsequent years, limited entry and open access vessels have been subject to area closures to protect groundfish Essential Fish Habitat (EFH) and required to carry vessel monitoring systems (VMS).¹⁴

The ocean shrimp fishery has been active at Crescent City since the early 1970s. Over the years, this fishery has been subject to restrictions including finfish excluder devices to minimize groundfish bycatch (2002), area closures to protect groundfish EFH (2006), and VMS (2007). In addition, these vessels are also subject to state regulations including limited entry (for vessels north of Point Conception), a November through March closure (to protect egg-bearing females), and maximum count-per-pound and minimum mesh size (to protect juvenile shrimp; (CDFG 2007). Prior to 2008, shrimp trawling was allowed in state waters 2–3 miles from shore between Point Reyes and False Cape; since then, ocean shrimp trawl grounds in state waters have been closed. Of

the 85 pink shrimp permits retired by the 2003 groundfish trawl buyback (which required vessels bought out of the groundfish fishery to retire all of their permits for West Coast fisheries), 31 were held by California vessels, and 12 of these were held by Crescent City-based boats (Federal Register 2003).

Management of the groundfish fishery in state waters (0–3 miles) also has become substantially more restrictive. Motivated by the rapid growth of the live fish fishery (McKee-Lewis 1996), the passage of the Nearshore Fishery Management Act (within the state's Marine Life Management Act, MLMA) in 1998 established a permit program and minimum sizes for 10 commonly caught nearshore species (effective in 1999), and mandated the development of a Nearshore FMP. In 2001, the nearshore rockfish fishery was closed outside 20 fathoms from March through June. Two years later, the state implemented the Nearshore FMP which specified management measures for 19 nearshore species including gear and seasonal restrictions, as well as a restricted access program as a means to achieve the statewide capacity goal of 61 participants (down from 1,128 in 1999). Statewide, the number of permits issued in 2009 (179) was still well above the capacity goal. In the North Coast Region, however, the 22 permits were issued in 2009, and as of mid-2010, 15 permits had been issued – one greater than the capacity goal of 14 for the region.¹⁵

The Dungeness crab fishery at Crescent City has not experienced the types of dramatic management changes as have occurred in the salmon and groundfish fisheries. In managing the fishery, the state has used a “three S” (sex, size, season) strategy that includes male-only harvest (since 1897), a minimum size limit (since 1911) and a limited season (since 1957). In 1992, the state placed a moratorium on entry; in 1995, a restricted access program

was implemented. The northern crab season usually runs from December 1 through July 15 (with an early season opener off San Francisco starting November 15), but its start has been delayed in some years because of price disputes. In addition, the opening of the season may be delayed to insure that the crabs have completed molting, as occurred in 2005. In 2009, pursuant to SB 1690 (2008), the state convened a Dungeness Crab Task Force in response to concerns about recent increases in participation and gear use. Following the recommendation of the Task Force (California Dungeness Crab Task Force 2010), a bill that would establish a pilot crab pot allocation program to address those concerns (SB 1039, Wiggins) is pending in the State Legislature.

Recreational Fishery Management

Concerns regarding Klamath fall Chinook and coho have influenced management of the recreational salmon fisheries in the Crescent City area. Many of the factors that have constrained the KMZ commercial fishery also have affected the recreational ocean salmon fishery. However, due to its lesser impact on Klamath fall Chinook, the KMZ recreational fishery has generally been less constrained than the KMZ commercial fishery, although more so than the recreational salmon fishery elsewhere in the state.

In 1979, the KMZ recreational season and bag limit were reduced for the first time (PFMC 2005). In 1986, the season was reduced from about nine to five months. Since then, seasons in the California KMZ have generally ranged from one to six months, with several notable exceptions (i.e., the 14-, 0-, and 10-day openings in 1992, 2008, and 2009, respectively), in contrast to other parts of

the state, where the recreational season generally extends for six to nine months (PFMC 2009). While the KMZ recreational fishery is much reduced from the peak 1970s and 1980s, it remains an active fishery that attracts both resident and nonresident anglers – at least in those years when recreational opportunity is available.

The recreational rockfish fishery has been increasingly constrained since the late 1990s to address concerns regarding overfished groundfish stocks. Beginning in 1998, sub-limits were added to the overall groundfish bag limit to protect species of concern. For the management area north of Cape Mendocino (including Crescent City), the species of concern were lingcod, canary and (by the early 2000s) yelloweye rockfish. California's longstanding groundfish bag limit of 15 fish was reduced to 10 fish in 2000. By 2009, regulations included a 2-fish sub-limit each for greenling, bocaccio, and cabezon, and prohibited retention of cowcod, canary, yelloweye and bronze-spotted rockfishes. The State began implementing inseason closures in this area in 2000, and added depth-based restrictions as inseason measures in 2004. By 2005, preseason specifications included closures or depth-based restrictions for every month of the year. In 2008, the once year-round season was compressed to four months. In 2008, CDFG considered Yelloweye RCAs in addition to existing depth-based closures, but ultimately did not implement them. Instead, the nearshore recreational groundfish fishery was closed four months early.

THE CRESCENT CITY FISHING COMMUNITY TODAY

The Crescent City Harbor fishing community is comprised of commercial and recreational fishery participants and their families, as well as fishery-support businesses (including the harbor district) that provide goods and services that fishery participants need to operate safely and effectively (Table 1 and Table 2). Local commercial fisheries include a diversity of participants engaged in a range of fisheries

and fishery-related activities. Recreational fisheries include private boat operations and a commercial passenger fishing vessel (CPFV, or charter) operation that involve locals and nonlocals alike.

Commercial Fisheries

The primary commercial fisheries at Crescent City include the pot fishery for Dungeness

Table 1. Local support businesses used by Crescent City fishery participants (as of March 2009).

Business Type	Business Name	Estimated Employment
Receivers	Alber Seafood	4–18 FT, 100–120 seasonal
	Caito Fisheries	1 FT, some seasonal
	Carvalho Fisheries	4 FT
	LCZ Unloaders	16–20 FT/PT
	Next Seafood	1 FT, 10–25 seasonal
	Nor-Cal Seafood	
	Pacific Choice Seafood	1FT, 2–4 PT
Processors	Alber Seafood	(see above)
Marine Supply	Englund Marine	4 FT
Marine Repair (mechanical, electrical, or hydraulic)	Crescent City Electric	
	George’s Auto Diesel Electric	
	Larry’s Equipment & Marine Repair	1 FT
	Mor-Jon, Inc.	10–11 FT, 1 PT
	Northcoast Marine Electronics	1 FT
Marine Refrigeration	Pete’s Auto & Marine Repair	2 FT
	Frank’s Refrigeration	
Cold Storage	none	-
Ice Facility	Del Norte Ice (Pacific Choice Seafood)	1 FT, 1 PT*
Fuel Dock	C Renner Petroleum	1 PT (dock service)
Bait	Englund Marine	(same as above)
Vessel Repair/ Maintenance	Fashion Blacksmith	10 FT
Commercial Diver	Unknown	
Retail Fish Market	Lucy’s Seafood (seasonal)	
Charter Operation	<i>Golden Bear</i> Fishing Charters	
	<i>Tally Ho II</i>	1 FT
Port Management	Crescent City Harbor District	4 FT, 3 PT, 2 seasonal
RV Parks	Harbor RV Park	3 PT
	Bayside RV Park	

* Overlaps with Pacific Choice Seafood

Table 2. Out-of-area businesses used by Crescent City fishery participants.

Business Name	Business Type	Location
Monterey Fish Co.	Bait	Watsonville, Salinas
Various	Bait	Los Angeles, Eureka; Reedsport, OR Ilwaco, Westport, WA
David Peterson	Boatwright	Eureka
Harbor Logging	Cable	Brookings, OR
Trilogy	Crab pot materials	Bellingham, WA
Custom Crab Pots	Crab pot materials	Eureka
Fred’s Marine	Electronics	Eureka
Chetco Marine	Marine supplies	Chetco, OR
Costco	Miscellaneous supplies	Eureka
	Outboard mechanic	Eureka; Medford and Grants Pass, OR
Cabella’s	Sport fishing clothing, gear	Online
Foul Weather Trawl	Trawl nets/gear	Newport, OR
	Various supplies	Redding; Medford, OR
NOAA Weather Service	Weather information	Eureka (online)

crab, and the trawl¹⁶, hook-and-line and trap fisheries for various groundfish species.¹⁷ Other current include the trawl fisheries for pink shrimp (*Pandalus jordani*) and Pacific whiting (*Merluccius productus*), the pot fishery for coonstripe shrimp (*Pandalus danae*), and troll fisheries for Chinook or king salmon and albacore tuna (*Thunnus alalunga*).

Most of these fisheries are seasonal as a function of resource availability, regulations that define when, where and how each fishery is allowed to operate, the availability of buyers, and market demand (Table 3). However, it should be noted that the actual temporal distribution of activity is often more compressed, variable and complex than suggested by the table. For instance, the availability of albacore varies widely from one year to the next. The salmon fishery in California’s KMZ was completely closed in 2006, 2008 and 2009, and open only briefly in 2007. The Dungeness crab fishery is concentrated in the winter months due to peak holiday demand. Groundfish seasons tend to

be defined in two-month increments (reflecting the use of bimonthly vessel cumulative landing limits), vary by species and fishery sector, and are sometimes subject to inseason closure to prevent OYs of selected species from being exceeded.

About 100 commercial fishing vessels are homeported at Crescent City. Commercial fishery participants described the makeup of the resident fleet as including five trawlers, 12 nearshore fishing operations, and about 85 to 90 crabber/trollers. While most local fishermen focus on a particular fishery, most participate in one or more additional fisheries during the year. The fleet includes both full-time and part-time fishermen. Full-time skippers depend on fishing for their livelihood and fish year-round, as resource availability, weather and regulations permit. Part-time skippers fish part of the year, often focusing on a single fishery, and may pursue other activities as part of their livelihood.

Table 3. Seasonality of selected commercial fisheries at Crescent City Harbor.

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC
Albacore tuna												
Coonstripe shrimp												
Dungeness crab												
Groundfish												
Pacific whiting												
Pink shrimp												
Salmon												

Vessels are characterized as either ‘big boats’ (55 feet long or larger) or ‘small boats’ (less than 55 feet). Big boats include trawlers and larger crabber/trollers. These vessels tend to be ‘trip-boats’, equipped with comfort and safety features that enable them to venture as far south as the San Francisco Bay area (particularly for the mid-November Dungeness crab opener), north into Oregon and Washington, and further offshore for a few days to several weeks to follow the fish. Small boats tend to fish for some combination of crab, groundfish, coonstripe shrimp, and perhaps salmon. These vessels usually work as ‘day-boats’, leaving port early in the morning to fish nearby, then returning to Crescent City the same day to unload their catch. Larger boats may carry two to four crew (including the skipper); smaller operations may carry one to three crew.

In addition to resident vessels, many transient vessels also use the harbor. For example, of the 157 boats that landed at Crescent City in 2007, an estimated 37 (about 24%) were nonresident vessels from Oregon and Washington as well as other California ports. According to study participants and other sources, historically, more than half of the vessels that landed fish commercially at Crescent City were nonresident. A small number of nonlocal groundfish trawlers still do deliver their catch,

obtain services or reprovision at the port. All of the vessels that deliver whiting at Crescent City are nonresident.

Crescent City Harbor Seafood Receiving, Processing and Marketing

Presently, local fish receiving and processing capacity consists of six buyers with receiving stations at the harbor and one onsite receiver/processor, Alber Seafoods, Inc. Some buyers receive fish on behalf of other entities based elsewhere along the West Coast as well as their own business. The chain of custody generally follows from fishing vessel to receiver, with most of the catch transported out of Crescent City for processing and distribution (Figure 3). Some businesses are vertically integrated and function in multiple roles (e.g., receiver, processor, wholesaler).

In 2007, about half of the 20 entities that received fish at Crescent City (including fishermen who sold their own and in some cases others’ catch) were based in the area. One of the seven fish businesses that operate receiving stations on Citizens Dock is locally owned. The other receivers, as well as outside buyers for whom they serve as agents, are based as far north as Ilwaco, Washington and as far south as Los Angeles, California. There is also a seasonal crab market near the boat basin.

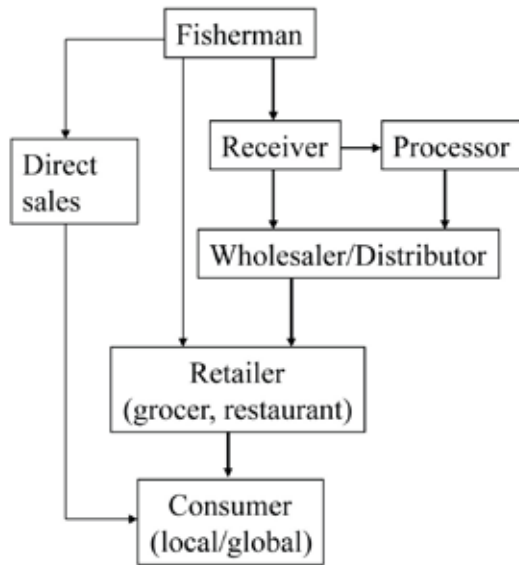


Figure 3. Pathways of seafood landed at Crescent City Harbor. Note: Thicker arrows indicate most common pathways.

Product forms vary within and across fisheries (Table 4). Most whiting, groundfish and crab is processed on a relatively large scale locally. Live crab, coonstripe shrimp and rockfish have become more common over the past decade, largely due to growing demand in the San Francisco Bay area. Small amounts of groundfish and crab are processed on a small scale (e.g., as groundfish fillets) in the Crescent City area for local and regional distribution. One local buyer sells to the public during crab season (winter), and a handful of albacore trollers sell directly to consumers (through off-the-boat sales) during the late summer and fall.

Ocean Recreational Fishing

Decades ago, “salmon was king,” and for study participants, it still is. In addition, anglers target albacore, groundfish (i.e., rockfish and lingcod, *Ophiodon elongates*), and Dungeness crab. Private boat fishing has long been the dominant mode of ocean recreational fishing here. For a period of 4 to 5 years in the late 1990s, Crescent City had no charter operations. Then in 2000, the *Tally Ho II* began operations. Although equipped to carry up to 14 fishing passengers or 20 whale watching passengers, it currently operates primarily as a ‘six-pack’, carrying no more than six fishing passengers reportedly because of the limited availability of crew. The operator describes his clientele as 15% local (within Del Norte County) and 85% nonlocal, coming primarily from inland communities throughout California, Arizona and outside the US.¹⁸

As with commercial fisheries, the seasonality of Crescent City’s recreational fisheries (Table 5) is defined by resource availability, weather and regulations, and is often more compressed and variable than indicated in the table. For instance, the availability of albacore varies widely from year to year. The salmon fishery in California’s KMZ is open only for a subset of days in some months in order to extend the length of the season; it was completely closed in 2008 and open for only 10 days in 2009. The groundfish fishery, which was open year-round through the early 2000s, has not opened until May in recent years and has also been

Table 4. Product forms, processing location and destination of seafood landed at Crescent City Harbor.

Fishery	Product forms	Processing location	Markets
Coonstripe shrimp	Live	n/a	San Francisco Bay area
Dungeness crab	Cooked whole & sectioned, picked and canned, live	Crescent City, Eureka, Other West Coast	Local to nationwide
Groundfish	Whole, filet, live	Crescent City, Eureka, Fort Bragg, Other West Coast	Local to overseas
Pink shrimp	Picked and canned	Eureka	State to nationwide
Salmon	Whole, filet, steak	Eureka, Fort Bragg, Other West Coast	Local to nationwide
Pacific whiting	Filet, head/gut, surimi	Crescent City (little), Other West Coast	Overseas

Table 5. Seasonality of major recreational fisheries at Crescent City Harbor.

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC
Albacore												
Crab												
Groundfish												
Salmon												

subject to late-season closure to prevent OYs of selected species from being exceeded.

Harbor Infrastructure and Fishery-Support Businesses

Crescent City’s commercial and recreational fishery participants depend on infrastructure, including docks, equipment, various facilities, and goods and services provided by the harbor district and other local and regional fishery-support businesses. Harbor-owned infrastructure consists of 15 acres of dock, pier and boat slip facilities, as well as buildings, parking and storage areas, launch ramps (one with trailer parking), and equipment such as a Travelift and hoists (Table 6). Buildings include two commercial fish processing facilities (one currently in operation), several small receiving stations, an ice plant, a fuel dock, a wastewater treatment plant, an indoor vessel repair facility, retail spaces, a storage yard and the harbor office. Two RV parks (with 129 and 137 spaces, respectively), five food service establishments and several other businesses lease space from the harbor. A Coast Guard base for the Cutter *Dorado*, a Sheriff’s Marine Patrol station, and a former aquaculture facility also are located on Whalers Island. In all, approximately 20 businesses at or near the harbor provide goods and services that directly support commercial and recreational fishing activities (see Table 1).

Although specific needs vary by fishery and fishing operation, the businesses most

commonly used by commercial fishermen at the harbor include receivers/processors, and marine repair and supply services, as well as restaurants and grocery stores located in town. A vessel fabrication and repair facility (Fashion Blacksmith) primarily services out-of-town commercial vessels, but also works on local vessels and fabricates equipment such as fish and boat hoists. Although recreational fishermen do not use facilities related to fish receiving and processing or large vessel construction and repair, they use the marine supply store, mechanical and electronic services, RV parks, and local restaurants and groceries.

When it was built in the early 1970s, the inner boat basin had 308 slips for vessels ranging in length from 30 to 70 feet. By 2006, the



Table 6. Crescent City Harbor user groups, infrastructure and services.

User groups	Harbor-owned infrastructure	Harbor services	Resident business types
Commercial fishing	Docks/slips Inner Basin (~230)	Bilge pump-out station	Fish buyers (7)
Recreational fishing (charter, private boat and shore-based)	Outer Basin (variable)	Oil recycling station	Fish processor (1)
Resident businesses & organizations	Launch ramps (2)	Bathrooms/showers	Electronics services (2)
Community residents	Parking	Dredging of harbor channel and berthing	Marine supplies (1)
Tourists	Offloading Infrastructure	Visitor berthing	Bait/tackle shop (1)
	- Docks (4)	Fuel, water, ice	Fuel dock (1)
	- Hoists (6 receiving, 1 public)	Dock power	Ice Plant (1)
	- Receiving stations (7)	Waste disposal and recycling	Commercial divers (4)
	- Receiving/processing buildings (2)	Dry storage	Boatyard (1)
	Other Infrastructure		Restaurants (5)
	- Fish cleaning station		RV parks (2)
	- Work dock		
	- Transient dock		
	- Boatyard		
	- Wastewater treatment plant		

number of slips dropped to 228 because of deferred maintenance (RRM Design Group 2006), and decreased further following damage from the tsunami in November of that year. The outer boat basin contains docks that are installed seasonally, and can provide berthing for up to 500 smaller boats. These slips are used primarily by recreational fishermen during the summer. Occupancy of both inner and outer basin berthing has declined in recent years with the reduction in fishing opportunities. Occupancy of the inner basin's 228 slips averaged 68% between 1999 and 2003, down from full occupancy in prior years (RRM Design Group 2006). Outer basin slip occupancy declined from about 500 in 1980, to 250 in 1999, and to about 50 in 2008.

Although Crescent City has considerable infrastructure and fishery-support businesses, some fishermen obtain goods and services

at other ports, usually in connection with fishing near those ports. For example, some reported purchasing bait in Eureka or Westport, Washington (see Table 2). Some larger operations haul out (for maintenance) at ports in Oregon and Washington. Fishermen reported traveling to Eureka for supplies, vessel maintenance and repair; some also reported obtaining crab and trawl gear in Eureka, Newport, Oregon and Bellingham, Washington.

Fishing Organizations and Events

Two commercial fishing associations are active at Crescent City. The Fishermen's Marketing Association (FMA), based in McKinleyville, California, was established in 1952 by a group of Eureka-based groundfish trawl fishermen to address marketing issues with fish buyers, and in later years, management issues. In the late 1980s, the organization expanded to include

shrimp trawlers and groundfish trawlers from other areas. With the 2003 groundfish trawl buyback retiring a large portion of the Crescent City trawl fleet, the FMA has a somewhat diminished presence locally.

The locally-based Del Norte Fishermen's Marketing Association, established in the early 1970s, primarily represents crabber/trollers, and has focused on market orders for salmon and crab and legal issues in the crab fishery. The organization also has sponsored two fish fries a year, through which it raises funds and educates the public. The association's membership has ebbed and flowed in connection with issues and conditions in the fisheries. As one local fisherman noted, "when salmon was big," the organization was very active, with about 95% of local crabbers and trollers as members. They funded the organization with self-imposed assessments on their catch. Following the establishment of the KMZ and the drop in local salmon fishing

activity, however, the organization became inactive. More recently, the organization has become active again, supported by annual membership fees rather than catch-based assessments to address issues including management of the crab fishery and the state's Marine Life Protection Act (MLPA) process, began in the North Coast region in late 2009.

At one time, Crescent City also had a Commercial Fishermen's Wives Association, which sponsored an annual Labor Day Seafood Festival (1983–1993) with the local Sea Grant Extension Program. However, as many wives and partners entered the workforce, the Fishermen's Wives Association has become inactive.

Although there are a number of recreational fishing organizations in the state, some of which cover the North Coast, none of these is active at Crescent City.

COMMERCIAL FISHERY ACTIVITY AT CRESCENT CITY HARBOR

The information in this section is based on customized summaries of Pacific Fisheries Information Network (PacFIN) landings receipt data, augmented by sources that provide earlier and/or longer-term data, as well as data from fieldwork conducted in 2007 and 2008. In the discussion that follows, the ‘long term’ is the period from 1981 through 2007, whereas ‘recent years’ pertains to the period from 2003 through 2007, unless otherwise noted.¹⁹ The purpose of focusing on these two time periods is to demonstrate how recent activity compares to longer-term historical levels. While the long-term trends described in this section begin in 1981, it should be noted that some local fisheries (e.g., groundfish, salmon, crab) were established well before that year (see Figure 2).²⁰

We use five measures of fishing activity derived from the landings receipts data for the most common local fisheries, define as species-gear combinations (e.g., salmon troll, groundfish trawl), and for all fisheries combined. Landings are reported as ‘round weight’ (in pounds), which reflects the total weight of the fish caught. (For species like salmon, which are gutted at sea, landed weights are converted to round weights to provide comparability with other species.) Ex-vessel value represents the amount paid to fishermen at the first point of sale (usually to a dockside buyer or receiver). Prices are calculated as the total ex-vessel value divided by total pounds landed, and therefore represent an average, rather than the (potentially wide) range of prices paid over the year. Both ex-vessel value and price (US\$) are adjusted for inflation using 2007 values as a base. Boat counts represent individual (resident and nonresident) fishing operations, though not necessarily individual fishermen, as some fishermen may own and/or operate multiple boats. Buyer counts are based on the number

of unique buyer IDs in the landings data, and include fishermen who land their own catch (e.g., for off-the-boat sales, delivery to restaurants) as well as fishermen and fish buyers who purchase fish from fishermen delivering their catch at the docks. The number of trips provides a count of the number of deliveries each boat makes at the port.²¹ Data are reported by calendar year. To insure confidentiality, data are not reported for some fisheries and/or years if fewer than three vessels and/or buyers participated in that year or fishery.

Fishing activity at Crescent City Harbor varied considerably over the period 1981–2007. Annual landings were 14.6–23.4 million pounds during the period 1981–1987, increased to 21.1–39.3 million pounds during the period 1988–1998, then declined to 5.3–17.8 million pounds during the period 1999–2007 (Figure 4). Annual ex-vessel value was \$12.2–\$23.1 million between 1981 and 1987, \$13.6–\$24.8 million between 1988 and 1998, and \$6.4–\$23.4 million between 1999 and 2007. Whereas the increase in revenue between the first two periods was modest, the decline between the second and third periods was notable, with record low revenues (less than \$7.2 million) experienced in three recent years (2001, 2002, 2005; Figure 5).



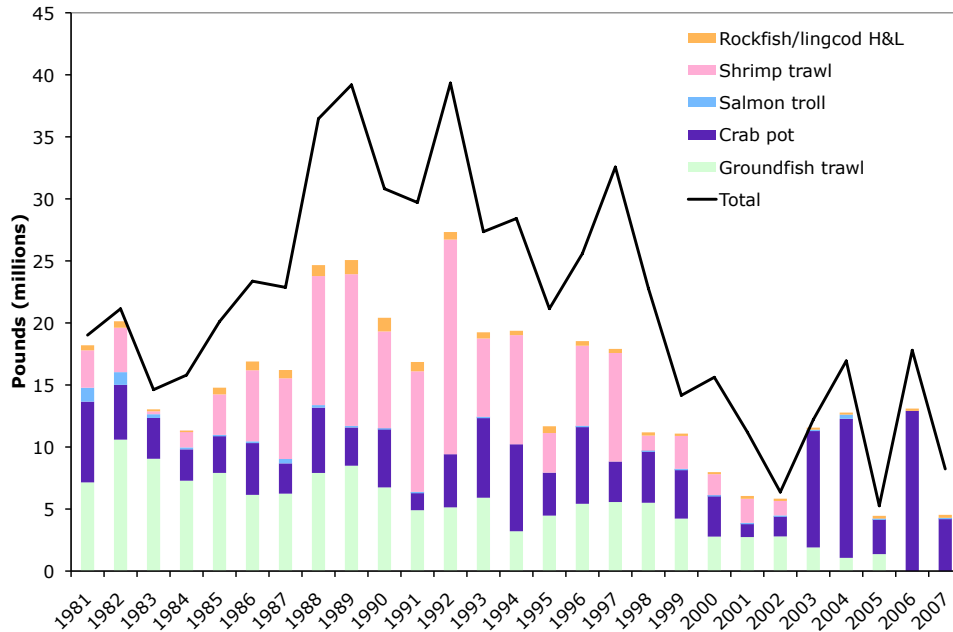


Figure 4. Commercial fishery landings (pounds) at Crescent City for selected fisheries and overall, 1981–2007. Note: Activity cannot be reported for years when more than zero and fewer than three boats or buyers participated in the groundfish trawl (2006–2007), salmon troll (1992, 1995, 1997) and shrimp trawl (2003–2005, 2007) fisheries.

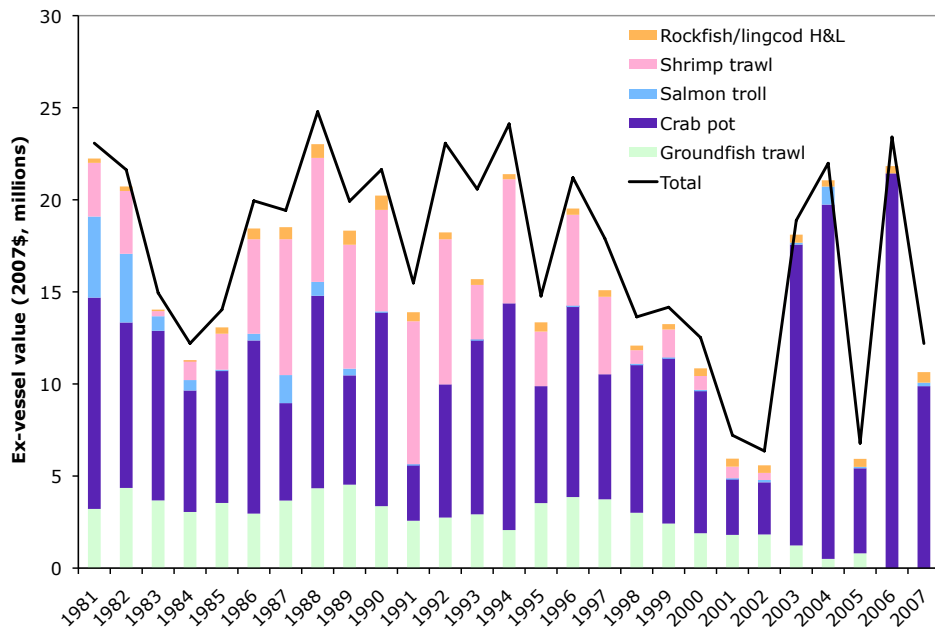


Figure 5. Ex-vessel value (2007\$) of commercial fishery landings at Crescent City for selected fisheries and overall, 1981–2007. Note: Activity cannot be reported for years when more than zero and fewer than three boats or buyers participated in the groundfish trawl (2006–2007), salmon troll (1992, 1995, 1997) and shrimp trawl (2003–2005, 2007) fisheries.

Average annual landings in recent years (12.1 million pounds) were 44% lower compared to the long-term average (21.4 million pounds; Table 7). At the same time, the total ex-vessel value of the landings was only 4% lower in recent years (\$16.7 million) than the long-term average (\$17.3 million). This discrepancy is due primarily to the growth of the crab fishery (with higher ex-vessel prices compared to trawl-caught groundfish). The emergence of lower volume, higher price-per-pound live fish fisheries for rockfish and coonstripe shrimp, and the increase in sablefish activity and prices, together with declines in the higher-volume, lower-price groundfish and shrimp trawl fisheries have contributed to this differential outcome.

The recent average number of vessels (154, resident and nonresident combined) with landings at Crescent City is 57% less than the long-term average of 363 boats (Table 7). This change is due largely to the curtailment of the salmon fishery in the mid-1980s, but also to attrition following implementation of limited entry programs in several fisheries, and the reduction in local processing capacity in recent years. The number of boats declined sharply from 1,082 (mostly salmon trollers) in 1981 to 320 in 1985, then ranged between 312 and 503 through 1994 before declining further to fewer than 170 since 2001 (Figure 6). Of the 1,082 boats that made commercial fishery landings

at Crescent City in 1981, 911 (84%) landed salmon and 246 (23%) landed crab. Since 1990, however, the proportion landing salmon has declined to 0%–29%, while the proportion landing crab has increased to 57%–89%.

The number of trips in Crescent City dropped sharply from a high of nearly 15,000 in 1982 (a majority of which were salmon) to fewer than 3,800 since 1998 (Figure 7). Annual effort in recent years averaged 3,044 trips, 48% lower than the long-term annual average of 5,882. The only fishery for which effort has been higher in recent years than the long term is the relatively new coonstripe shrimp fishery, which has a small number of participants and a limited (five-month) season. In the early 1980s, the salmon fishery accounted for 53% of all trips into Crescent City. As salmon fishing declined, crab trips accounted for a variable but increasing proportion of trips, peaking at 80% in 2006, and averaging 68% for the short term. The rockfish and lingcod hook-and-line fishery accounted for 22% of trips over the long term and 19% over the short term. All other fisheries accounted for 8% or less of trips over the long term, and 3% or less in the short term.

The number of fish buyers at Crescent City has varied considerably over the last 27 years, both within and among fisheries. Overall, the number of buyers was 34–45 during the period 1981–1983, decreased to 19–28 during

Table 7. Long-term and recent annual average, percent difference, and highs and lows in selected measures for commercial fisheries at Crescent City, 1981–2007.

	Long-term average 1981–2007	Recent average 2003–2007	Percent difference	High year(s) (amount)	Low year(s) (amount)
All Fisheries					
Landings (lbs)	21,411,639	12,087,253	-44	1992 (39,336,658)	2005 (5,260,636)
Ex-vessel value (\$)	17,255,298	16,651,100	-4	1988 (24,786,105)	2002 (6,358,568)
Boats	363	154	-57	1981 (1,082)	2005 (137)
Buyers	41	35	-15	1998 (65)	2007 (20)
Trips	5,882	3,044	-48	1982 (14,943)	2005 (2,128)
Price (\$/lb)	0.89	1.39	+55	2003 (1.55)	1989 (0.51)

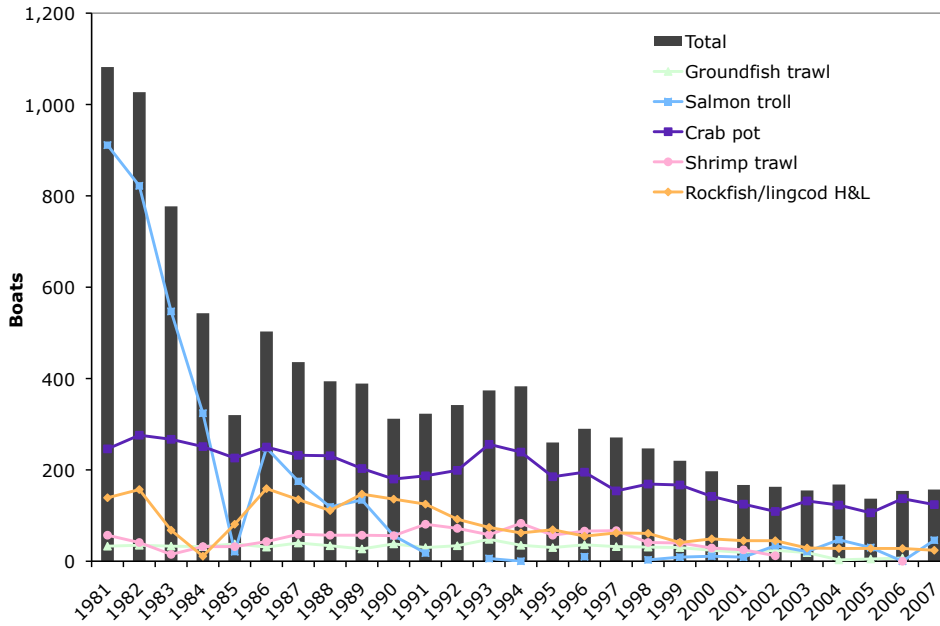


Figure 6. Number of boats with commercial fishery landings at Crescent City for selected fisheries and overall, 1981–2007. Note: Activity cannot be reported for years when more than zero and fewer than three boats or buyers participated in the groundfish trawl (2006–2007), salmon troll (1992, 1995, 1997) and shrimp trawl (2003–2005, 2007) fisheries.

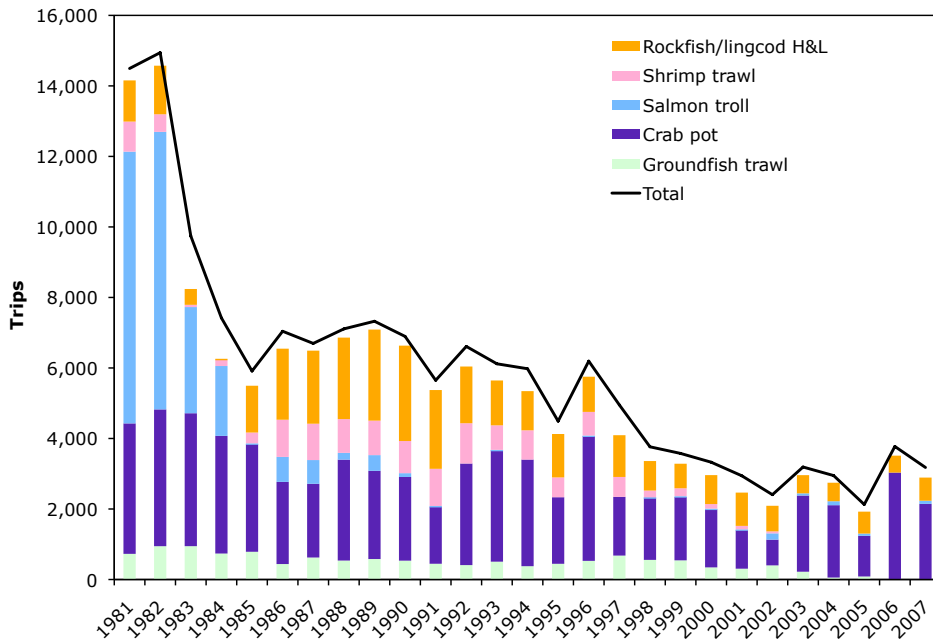


Figure 7. Number of trips by fishing vessels landing at Crescent City for selected fisheries and overall, 1981–2007. Note: Activity cannot be reported for years when more than zero and fewer than three boats or buyers participated in the groundfish trawl (2006–2007), salmon troll (1992, 1995, 1997) and shrimp trawl (2003–2005, 2007) fisheries.

the period 1984–1991, increased to 30–50 during the period 1992–2004, and decreased again to 20–27 during the period 2005–2007. Participants noted that despite an increase in the number of buyers, the actual number of ‘fish houses’ – large volume fish buyers that process and/or distribute the catch – has declined in the region.

Of the 23 buyers that received commercially caught seafood at Crescent City in 2005, about 75% were predominantly engaged in fish receiving (and perhaps processing, wholesale activities and distribution). The remaining receivers were fishermen who sell their own (and perhaps others’) catch directly to restaurants and other retailers and/or consumers. Of the 20 buyers that received fish at Crescent City in 2007, three accounted for slightly more than 55% of the landed value of the catch, five accounted for 75% and seven accounted for 90%. Eleven (just over half) of those receivers relied entirely on Crescent City for their California receipts, and 14 relied on Crescent City for more than 50% of their California receipts.

The average ex-vessel price for all fisheries combined is 55% greater in the recent term (\$1.39 per pound) compared to the long term (\$0.89 per pound). However, the trends vary among fisheries. Recent-term prices are lower than long-term prices in the shrimp trawl (-33%), whiting (-13%), albacore (-21%), crab (-11%) and shrimp pot (-7%) fisheries. In contrast, recent-term prices are greater in the rockfish hook-and-line (+82%), salmon (+13%), and groundfish trawl (+5%) fisheries.

The distribution of ex-vessel value among vessels and buyers provide insights into the extent to which consolidation of fishing activity has occurred. Over the past decade (1998–2007), the number of boats delivering fish to Crescent City decreased from 247 to 157, while the proportion of boats accounting

for 90% of landed value at the port increased slightly from 42%–46% prior to 2003 to 45%–54% thereafter. Over the same period, the number of buyers decreased from 50 to 20, while the proportion of buyers accounting for 90% of the landed value increased from 16% to 35%. While vessel and buyer concentration remain a feature of Crescent City fisheries, both have lessened since 1998. The reduction in buyer concentration has been more dramatic and is likely related to the closure of two major processors at the port around 2000.

Activity Within Commercial Fisheries

Crescent City has supported a diversity of fisheries over time. Crab, salmon, and groundfish trawl have historically been the mainstay of Crescent City’s commercial fisheries, together accounting for an average of 91% of the ex-vessel value of landings per year over the long term (1981–2007) and 97% in recent years (2003–2007). This section examines fishery activity based on landings data for these fisheries and for two others highlighted in our meetings with community members: the shrimp trawl and rockfish/lingcod hook-and-line and pot fisheries. Albacore troll, coonstripe shrimp pot and Pacific whiting trawl fisheries have played a role as well, and are discussed briefly.

The Dungeness Crab Pot Fishery

Dungeness crab has ranked first among the port’s commercial fisheries on most measures over the long term and in recent years. According to study participants, some of the best crab grounds are within a few miles of the harbor and, although the abundance of crab is cyclical, these grounds have been extremely productive. Historically, the crab was cooked and canned, but today crab is sold either cooked and frozen (whole or in sections), or live.

Between 1981 and 2002, landings varied widely between 1.1 million pounds (worth \$3.0 million) and 7.0 million pounds (worth \$12.3 million)

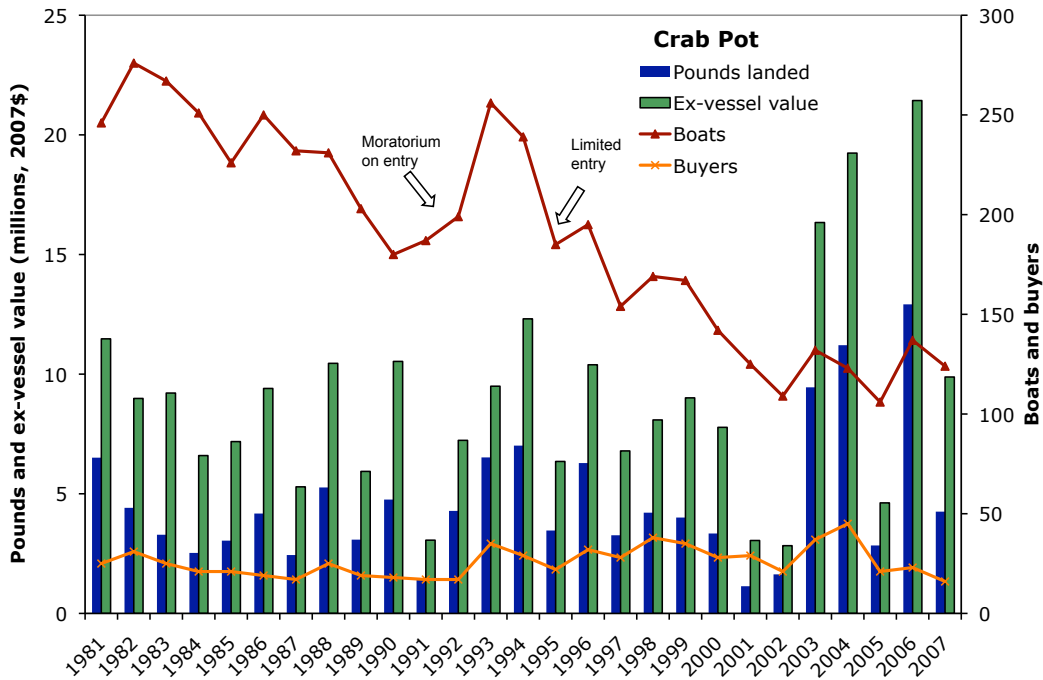


Figure 8. Landings, ex-vessel value (2007\$), and number of boats and buyers for the commercial Dungeness crab fishery at Crescent City, 1981–2007.

Table 8. Long-term and recent annual average, percent difference, and highs and lows in selected measures for commercial crab pot fishery at Crescent City, 1981–2007.

Crab pot	Long-term average 1981–2007	Recent average 2003–2007	Percent difference	High year(s) (amount)	Low year(s) (amount)
Landings (lbs)	4,449,260	8,133,587	+83	2006 (12,916,602)	2001 (1,135,811)
Ex-vessel value (\$)	8,625,771	14,301,909	+66	2006 (21,434,629)	2002 (2,830,656)
Boats	189	124	-34	1982 (276)	2005 (106)
Buyers	26	34	+34	2004 (45)	2007 (16)
Trips	2,416	2,108	-13	1982 (3,880)	2002 (730)
Price (\$/lb)	2.04	1.81	-11	1983 (2.80)	1993 (1.46)

(Figure 8, Table 8). The record low activity experienced in 2001 and 2002 (1.1–1.6 million pounds, \$2.8–\$3.0 million) was followed by three extraordinary years (2003, 2004, 2006) in which landings and value ranged between 9.4 and 12.9 million pounds and \$16.3 and \$21.4 million, respectively.²²

The numbers of boats and buyers participating in the crab fishery also have fluctuated, although not in synchrony with landings. Average annual vessel participation in recent years was 124 boats, 34% lower than the long-term average of 189 boats. Participation peaked at 246–276 boats during the period 1981–1984 and 256 boats in 1993. However, the general trend has been a marked decline



from more than 245 boats in the early 1980s to 109–137 boats since 2001. The average number of buyers (including fishermen selling their own catch) was 34 in recent years, a 34% increase from the long-term average of 26. The number of buyers increased from 6–11 for the period 1981–1997 to 11–19 for the period 1998–2005, then declined to 11–12 for the period 2006–2007.

The number of crab trips at Crescent City averaged 2,108 in recent years, 13% lower than the long-term average of 2,416 trips. Trips peaked at more than 3,500 in 1981–1983 and 1996, and were at their lowest (730–1,981 trips) in 2001 and 2002 (the years of record low landings). During years of record high landings (2003, 2004, 2006), the number of trips ranged from 2,052 to 3,033, a rather “ordinary” level of effort. This apparent lack of synchrony between landings and trips may reflect, to a large extent, the marked increase in the number of traps used.

Local ex-vessel prices for crab averaged \$1.81 in recent years, an 11% decline from the long-term average of \$2.04. This change is somewhat unexpected, given the growth in the live market, which can offer prices twice those for cooked crab. However, larger landings in 2003, 2004 and 2006, especially early in the season when most of the product is directed to the lower-priced cooked and frozen sectioned crab market, may have kept average prices low

in recent years. Prices have varied considerably nonetheless, from a low of \$1.46 per pound (1993) to a high of \$2.80 per pound (1983). The crab fishery has played an increasingly central role for the Crescent City commercial fishing community as a result of several factors, most notably reduced opportunities in other fisheries and availability of and access to the resource. The proportion of fishing activity at Crescent City involving crab has been much higher in recent years relative to the long term. Crab boats as a proportion of total boats landing at Crescent City has increased from 52% to 81%. The contribution of crab trips have increased from 41% to 69%, of landings from 22% to 67%, and of ex-vessel value from 52% to 86% of those totals.

The Groundfish Trawl Fishery

Annual landings of groundfish declined steadily from 6.1–10.6 million pounds during the period 1981–1990 to 2.8–5.9 million pounds during the period 1991–2000, and to 1.1–2.8 million pounds during the period 2001–2007 (Figure 9, Table 9). Landings have averaged 1.4 million pounds in recent years, a 73% decline from the long-term average of 5.1 million pounds. The ex-vessel value of groundfish landings declined by 70%, from a long-term average of \$2.7 million to \$821,000 in recent years. Landed value fell from \$3.0–\$4.5 million during the period 1981–1990, to \$1.9–\$3.9 million during the period 1991–2000, and to \$500K–\$1.8 million during the period 2001–2007.



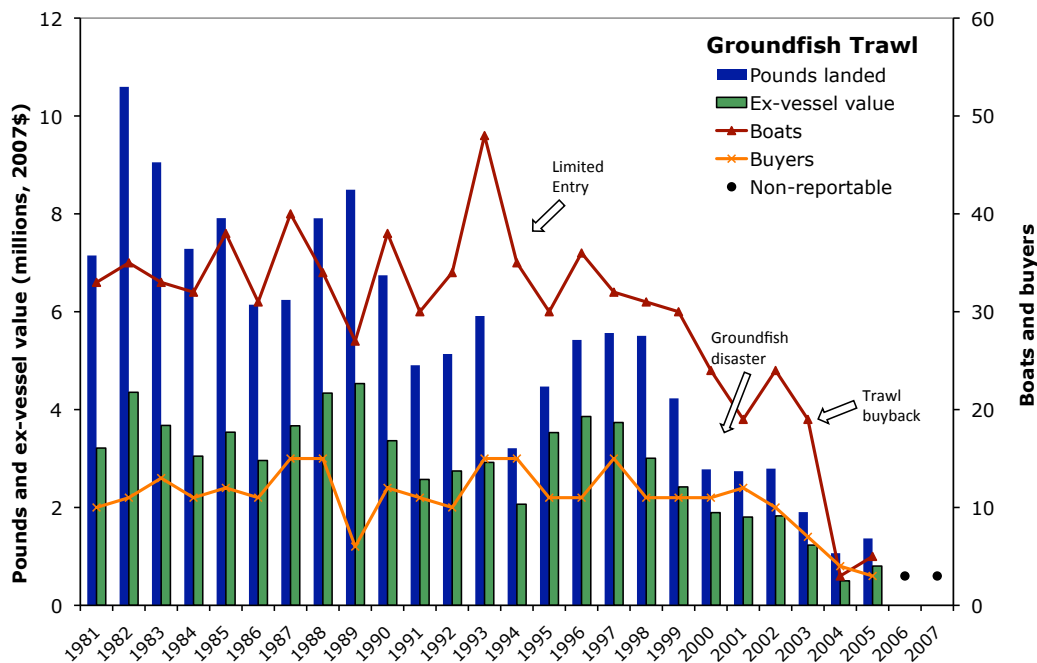


Figure 9. Landings, ex-vessel value (2007\$), and number of boats and buyers for the commercial groundfish trawl fishery at Crescent City, 1981–2007. Note: Activity cannot be reported for 2006 and 2007, when more than zero but fewer than three boats or buyers participated in the fishery.

Table 9. Long-term and recent annual average, percent difference, and highs and lows in selected measures for commercial groundfish trawl fishery at Crescent City, 1981–2007. Note: Data for 2006 and 2007, years when fewer than three boats or buyers participated in the fishery, are included in averages but excluded from highs and lows.

	Long-term average 1981–2007	Recent average 2003–2007	Percent difference	High year(s) (amount)	Low year(s) (amount)
Groundfish trawl					
Landings (lbs)	5,076,900	1,375,267	-73	1982 (10,595,055)	2004 (1,065,626)
Ex-vessel value (\$)	2,710,460	821,198	-70	1989 (4,531,671)	2004 (500,702)
Boats	28	8	-75	1993 (48)	2004 (3)
Buyers	7	2	-71	1987 (15)	2005 (3)
Trips	478	102	-79	1983 (946)	2004 (56)
Price (\$/lb)	0.56	0.59	+5	1995 (0.79)	1983 (0.41)

The number of trawlers landing groundfish at Crescent City averaged eight boats in recent years, a 75% decline from the long-term average of 28 boats. From 1981 through 1999, the number of boats ranged from 27 to 40 (except for the peak of 48 in 1993). Participation declined to 19–24 boats during

the 2000–2003 period (as regulations became more restrictive to protect overfished stocks), then fell sharply to 3–7 boats during the 2004–2007 period (following the trawl buyback). The number of groundfish buyers in Crescent City averaged 2 in recent years, a 71% decline from the long-term average of 7 buyers. The

number of buyers peaked at 10–13 from 1981 through 1986 and 1993 through 1994, and was 5–9 throughout the rest of the pre-2003 period. Since 2003, however, the number of buyers has fallen to 1–4.

An average of 102 groundfish trips were taken in Crescent City in recent years, a 79% decline from the long-term average of 478 trips (see Table 9). During the period 1981–1985, 728–946 trips were made per year; over the next 14 years (1986–1999), trips stayed within the 409–679 range. Effort declined to 221–401 trips during the period 2000–2003, then declined even further to 56–90 trips between 2004 and 2007 (after the trawl buyback).

The annual price of trawl-caught groundfish averaged \$0.59 per pound (for all species combined) in recent years, a modest 5% increase over the long-term average of \$0.56. The fishery targets a mix of species, with some species commanding a higher dockside price per pound than others. Changes in the species composition of landings, due to changing markets, abundance and limits on the catch of individual species, affect average ex-vessel prices.

Groundfish trawl activity at Crescent City has declined not only in absolute terms, but also as a proportion of total activity at the port. The proportion of vessels at Crescent City consisting of groundfish trawlers averaged 8% over the long term, relative to 5% in recent years. Over these same periods, the groundfish contribution to total trips declined from 8% to 3%, the contribution to landings declined from 24% to 11%, and the contribution to landed value declined from 16% to 5%.

The Salmon Troll Fishery

The commercial salmon troll fishery has historically played a vital role in the Crescent City fishing community (see Figure 2). However, dramatic changes occurred in

Crescent City's salmon fishery during the period 1981–2007 (Figure 10, Table 10). Average annual landings in recent years (89,000 pounds) are 40% lower than the long-term average of 149,000 pounds. These averages reflect a precipitous decline that occurred largely in the 1980s. Since 1990, landings have been consistently and very low, with the notable exception of 2004, when landings reached 337,000 pounds. The 2004 spike is due to an unusual abundance of Chinook salmon off the Southern Oregon coast; California fishermen fished nearby in waters off Oregon and delivered their catch at Crescent City.²³ Fishing was not allowed in the KMZ in 1985, 1992–1995 and again in 2006. Minimal landings occurring in those years, and were due to a small number of trollers who fished in other areas but landed their catch at Crescent City.

Ex-vessel values follow a pattern similar to landings, with average landed value in recent years (\$270,000) 49% lower than the long-term average of \$524,000. Landed value ranged between \$3.7 million and \$4.4 million in 1981 and 1982, then fell to \$57,000 in 1985; through the rest of the 1980s, ex-vessel value ranged from \$364,000 to \$1.5 million. Since 1990, ex-vessel values have been consistently very low (well below \$200,000 per year), with the notable exception of 2004, when the value was \$980,000.

The average annual number of boats in the fishery declined by 78% from a long-term average of 134 boats to an average of 29 boats in recent years (Tab. Participation declined from 911 boats in 1981 to 21 boats in 1985 (closure of the California KMZ in 1985 limited salmon participation to vessels fishing outside the KMZ that were willing to travel to Crescent City to land those fish). Participation rebounded to 248 boats in 1986 (when the KMZ reopened), then continued its downward trajectory to 18 boats by 1991. Participation

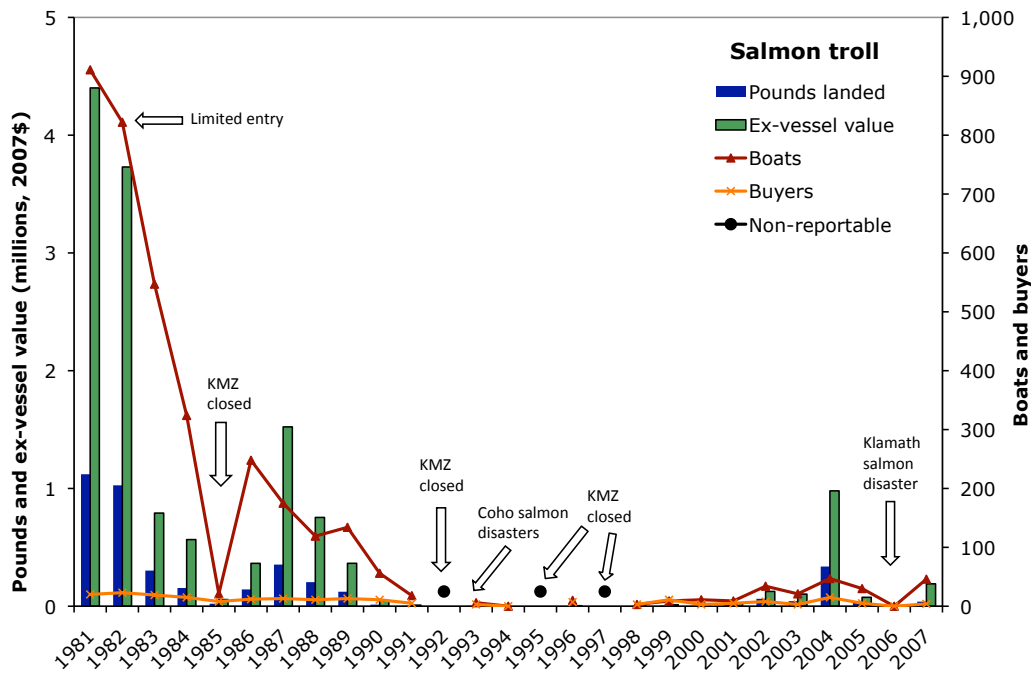


Figure 10. Landings, ex-vessel value (2007\$), and number of boats and buyers for the commercial salmon troll fishery at Crescent City, 1981–2007. Note: Activity cannot be reported for 1992, 1995 and 1997, when more than zero but fewer than three boats or buyers participated in the fishery.

Table 10. Long-term and recent annual average, percent difference, and highs and (nonzero) lows in selected measures for commercial salmon troll fishery at Crescent City, 1981–2007. Note: No landings occurred in 1994 and 2006. Data for 1992, 1995 and 1997, when fewer than three boats or buyers participated in the fishery, are included in averages but excluded from highs and lows.

Salmon troll	Long-term	Recent	Percent difference	High year(s) (amount)	Low year(s) (amount)
	average 1981–2007	average 2003–2007			
Landings (lbs)	148,643	89,499	-40	1981 (1,120,731)	1998 (753)
Ex-vessel value (\$)	524,265	269,718	-49	1981 (4,401,181)	1998 (1,685)
Boats	134	29	-78	1981 (911)	1998 (3)
Buyers	7	4	-43	1982 (23)	1993, 1998, 2000, 2003 (3)
Trips	866	66	-92	1982 (7,871)	1993, 1998 (6)
Price (\$/lb)	2.83	3.21	+13	2007 (4.89)	1983 (1.20)

declined further to 0–11 boats during the period 1992–2001, then increased to 21–47 vessels during the period 2002–2007 (except for 2006, when the KMZ was closed again). The number of salmon buyers averaged four in recent years, 43% lower than the long-term

average of seven. The number of buyers was 19–23 between 1981 and 1983, fell to 9–14 from 1984 through 1990, and declined further to 0–10 thereafter. Several fishermen who sell their own catch are included in these counts.

The annual number of salmon trips averaged 66 in recent years, a 92% decline from the long-term average of 866 trips. Fishing effort, which exceeded 7,800 trips in 1981 and 1982, declined precipitously to 26 trips in 1985 (when the California KMZ was closed). Effort rebounded to 708 trips in 1986, when the KMZ reopened, then continued its downward trajectory to 21 trips by 1991. Since 1992, effort has ranged from 0 to 178 trips per year, exceeding 100 in only two years (2002 and 2004).

Annual ex-vessel prices for salmon averaged \$3.21 per pound in recent years, a modest 13% increase compared to the long-term average of \$2.83 per pound. From 1981 through 1993, prices varied from \$2.51 to \$4.31. From 1995 through 2004, prices shifted downward to \$1.58–\$2.91 per pound. After the fishery closure in 2006, prices peaked at \$4.89 in 2007.

Salmon troll activity at Crescent City has declined not only in absolute terms, but also as a proportion of total activity at the port. The proportion of vessels that participated in the fishery averaged 37% over the long term, and 19% in recent years. Over these same periods, the salmon contribution to total trips declined from 15% to 2%, the contribution to landings remained unchanged at 1%, and the contribution to landed value declined slightly from 3% to 2%.

The Ocean (Pink) Shrimp Trawl Fishery

The shrimp trawl fishery, managed by the state with some federal oversight,²⁴ started along the North Coast in the 1950s, and expanded in the 1970s largely due to technological changes in fishing (i.e., double-rig trawl nets) and processing (i.e., shrimp peeling machines) (Frimodig et al. 2009). Although the shrimp trawl fishery has played a lesser role at Crescent City in recent years, historically it accounted for substantial landings, value

and participation, and provided part of the incentive for the construction of a wastewater treatment facility at the harbor. Since 2008, ocean shrimp trawl grounds in state waters have been closed between Point Reyes and False Cape (located south of Eureka). Crescent City shrimp fishermen reported fishing south of Cape Mendocino (delivering to Crescent City, Eureka or Fort Bragg) many years in the past, as the resource was often more abundant and accessible than in federal waters off Crescent City.

Shrimp landings exceeded three million pounds in 1981 and 1982, declined abruptly as the resource became scarce during the 1982–83 El Niño, then expanded steadily to 6.5 million pounds in 1987 (Figure 11, Table 11). Landings peaked between 1988 and 1992, ranging from 7.8 million to 17.3 million pounds. Landings declined to 1.2–8.8 million pounds between 1993 and 2002, then declined more abruptly to 0–350,000 pounds between 2003 and 2007. Annual landings averaged 172,000 pounds in recent years, 96% lower than the long-term average of 4.6 million pounds. Ex-vessel value followed a similar pattern, peaking at \$5.5–\$7.9 million between 1987 and 1992 and reaching lows of \$0–\$172,000 during the period 2003–2007. Annual landed value averaged \$78,700 in recent years, 97% lower than the long-term average of \$3.1 million.



The number of boats participating in the fishery dropped sharply from 57 in 1981 to 15 in 1983 (due to the scarcity of shrimp during the El Niño event), then peaked at 83 in 1994 (likely in anticipation of a state moratorium on entry into the fishery). Since then, the number of boats has declined, reaching lows of 0–7 boats since 2003. Annual participation

averaged three boats in recent years, 93% less than the long-term average of 41 boats.

From 1981 to 1982, 10–12 buyers of trawl-caught shrimp operated in Crescent City. The numbers of buyers fell to 4–9 from 1983 to 2001. Since 2002, however, the number of buyers has averaged one, 83% lower than the

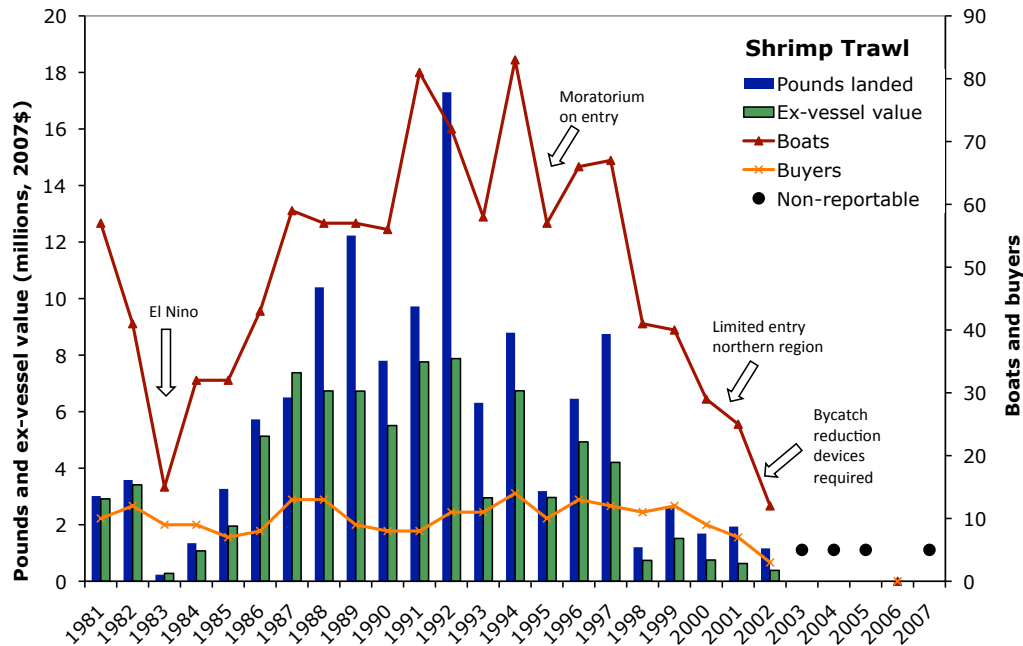


Figure 11. Landings, ex-vessel value (2007\$), and number of boats and buyers for the commercial shrimp trawl fishery at Crescent City, 1981–2007. Note: Activity cannot be reported for 2003–2007, when more than zero but fewer than three boats or buyers participated in the fishery.

Table 11. Long-term and recent annual average, percent difference, and highs and (nonzero) lows in selected measures for commercial ocean shrimp trawl fishery at Crescent City, 1981–2007. Note: No landings occurred in 2006. Data for 2003–2007, when fewer than three boats or buyers participated in the fishery, are included in averages but excluded from highs and lows.

Shrimp trawl	Long-term average 1981–2007	Recent	Percent difference	High year(s) (amount)	Low year(s) (amount)
		average 2003–2007			
Landings (lbs)	4,597,480	172,034	-96	1992 (17,298,714)	1983 (232,806)
Ex-vessel value (\$)	3,072,551	78,660	-97	1992 (7,877,070)	1983 (279,299)
Boats	41	3	-93	1994 (83)	2002 (12)
Buyers	6	1	-83	1994 (14)	2002 (3)
Trips	485	8	-98	1992 (1,143)	2002 (56)
Price (\$/lb)	0.66	0.44	-33	1983 (1.2)	2001 (0.32)

long-term average of six buyers. This is due in part to receiving and processing issues at the port despite reports from fishermen and others of increases in the resources and improved markets for the product.

The number of shrimp trawl trips dropped from 853 in 1981 to 64 in 1983. Effort subsequently increased to 912–1,143 trips between 1986 and 1992, then declined dramatically to 0–17 trips during the period 2003–2007. Annual shrimp trawl effort averaged eight trips in recent years, 98% lower than the long-term average of 485 trips.

Prices for trawl-caught shrimp have ranged widely, increasing from \$0.97 per pound in 1981 to a peak of \$1.20 per pound in 1983 (when shrimp were scarce). Since then, prices have generally cycled downward, reaching lows of \$0.32–\$0.49 during the period 2000–2007. Prices averaged \$0.44 per pound in recent years, 33% lower than the long-term average of \$0.66.

The shrimp trawl fishery accounted for about 11% of boats, 8% of trips, 22% of landings and 18% of landed value at Crescent City over the long term. The fishery's contribution to Crescent City activity has declined dramatically in recent years to 2% of boats, less than 1% of trips, and 1% of landings and landed value.

The Rockfish and Lingcod Hook-and-Line Fishery

Commercial fishing for rockfish and lingcod using hook-and-line and bottom longline gear has occurred at Crescent City for decades. Traditionally, the fishery produced whole fish and filets for retail and food service. Since the late 1990s the fishery also has served the live fish market, which emerged about a decade earlier in the southern part of the state.

Landings increased from 407,000 pounds in 1981 to a peak of 1.1 million pounds in 1989–1990 (Figure 12, Table 12). This upward

trend was interrupted in 1983–1984 by the 1982–1983 El Niño and extreme weather in 1984 that made fishing particularly difficult (CDFG 1984, 1985). Landings declined to 164,000–258,000 pounds during the period 1999–2007. The ex-vessel value of landings followed a similar pattern between 1981 and 1990, although the increase in value from 1985 to 1990 was not as dramatic as the increase in landings. After 1990, however, instead of declining as landings did, ex-vessel values varied from \$249,000 to \$572,000 without apparent trend.

Annual landings averaged 194,000 pounds in recent years, a 55% decline compared to the long-term average of 429,000 pounds. The ex-vessel value of landings increased by 6%, from a long-term average of \$410,000 to \$436,000 in recent years.

The trend in the number of rockfish hook-and-line fishery participants at Crescent City bears some similarity to the trend in landings. Participation averaged 27 boats in recent years, 64% lower than the long-term average of 76 boats. Prior to 1989, vessel participation varied widely, ranging between highs of 135–159 in 1981, 1982, 1986 and 1987 and a low of 11 boats in 1984. According to local fishermen, many displaced salmon fishermen entered the fishery in 1985 and 1986 when harvest opportunities in the KMZ were severely constrained. Participation reached 147 boats in 1989 and declined steadily thereafter to 41–49 during the period 1999–2002. From 2003 onward, participation declined again to fewer than 30 boats following the implementation of restricted access in the state's nearshore fishery.

The number of buyers in this fishery averaged 8 in recent years, a 43% decline from the long-term average of 14. Between 8 and 28 buyers participated during the period 1981–2004, then declined to 5–7 thereafter, due to fewer boats

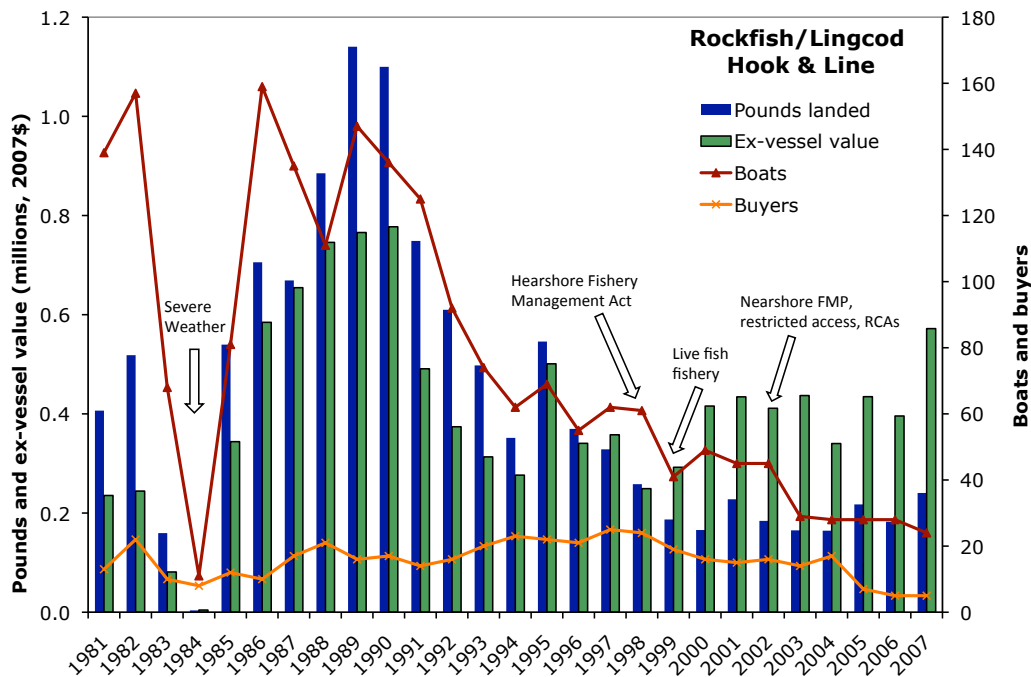


Figure 12. Landings, ex-vessel value (2007\$), and number of boats and buyers for the commercial rockfish and lingcod hook-and-line fishery at Crescent City, 1981–2007.

Table 12. Long-term and recent annual average, percent difference, and highs and lows in selected measures for commercial rockfish/lingcod hook-and-line fishery at Crescent City, 1981–2007.

Rockfish/Lingcod hook-and-line	Long-term average 1981–2007	Recent average 2003–2007	Percent difference	High year(s) (amount)	Low year(s) (amount)
Landings (lbs)	428,620	193,984	-55	1989 (1,140,393)	1984 (3,668)
Ex-vessel value (\$)	410,125	435,883	+6	1990 (777,303)	1984 (4,391)
Boats	76	27	-64	1986 (159)	1984 (11)
Buyers	14	8	-43	1997 (25)	2006 (5)
Trips	1,204	560	-53	1990 (2,705)	1984 (27)
Price (\$/lb)	1.24	2.25	+82	2003 (2.65)	1982 (0.47)

and lower landings. Most of the buyers are now local fishermen who sell their own and in some cases others' catch both locally and to San Francisco Bay area markets.

Annual effort averaged 560 trips in recent years, a 53% decline from the long term

average of 1,204. The trend in trips is similar to the trend in vessel participation. In 1981 and 1982, the number of trips exceeded 1,000, then dropped sharply to a low of 27 in 1984. Effort subsequently increased to a high of 2,705 trips in 1990, gradually declining to 480–657 trips during the 2003-2007 period.

Average annual prices ranged from \$0.47 to \$1.20 per pound between 1981 and 1998, increased to \$1.56 in 1999 and peaked at \$1.91–\$2.65 between 2000 and 2007. The increase in prices in the late 1990s coincided with the expansion of the live fish fishery. Prices in recent years averaged \$2.25 per pound, 82% higher than the long-term average of \$1.24.

Whereas this fishery has accounted for an average of only 2%–3% of total landings and ex-vessel value in Crescent City (over the long term and in recent years), it has accounted for a considerable proportion of fishing effort. The proportion of vessels at Crescent City that participate in this fishery averaged 21% over the long term, relative to 18% in recent years. Over these same periods, the contribution of this fishery to total trips also declined from 21% to 18%, while the proportion of buyers participating in the fishery declined from 42% to 31%.

The Coonstripe Shrimp Trap/Pot Fishery

California’s commercial trap fishery for coonstripe shrimp (*Pandalus danae*) is relatively new, started in 1992 by a small group of Crescent City fishermen. The lack of landings prior to 1992, and the low number of participants between 1992 and 1995 and again in 2007 limit the discussion here (Figure 13, Table 13).²⁵ Landings rose through the late 1990s, peaking at just over 81,000 pounds in 2000, then generally declined to a reportable low of 35,411 pounds in 2006. Annual landings averaged 45,343 pounds in recent years, similar to the long-term (1992–2007) average of 45,999 pounds.

Annual ex-vessel value averaged \$181,692 in recent years, a 9% decline from the long-term (1992–2007) average of \$199,623. Ex-vessel value more than doubled from \$181,000 in 1996 to a high of \$396,598 in 2000, then declined to \$143,530 by 2006 .

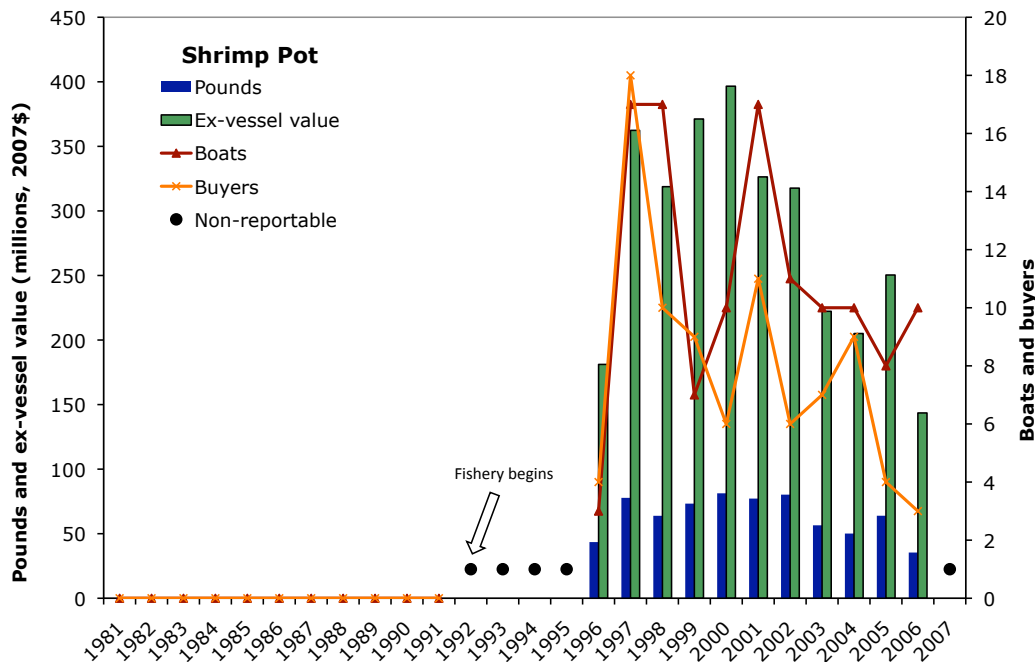


Figure 13. Landings, ex-vessel value (2007\$), and number of boats and buyers for the commercial coonstripe shrimp pot fishery at Crescent City, 1981–2007. Note: No landings occurred between 1981 and 1991. Activity cannot be reported for 1992–1995 and 2007, when more than zero but fewer than three boats or buyers participated in the fishery.

Table 13. Long-term and recent annual average, percent difference, and highs and (nonzero) lows in selected measures for commercial coonstripe shrimp pot fishery at Crescent City, 1992–2007. Notes: No landings occurred between 1981 and 1991. Data for 1992–1995 and 2007, when fewer than three boats or buyers participated in the fishery, are included in averages but excluded from highs and lows.

Coonstripe Shrimp pot	Long-term average 1992–2007	Recent average 2003–2007	Percent difference	High year(s) (amount)	Low year(s) (amount)
Landings (lbs)	45,999	45,343	-1	2000 (81,278)	1996 (43,502)
Ex-vessel value (\$)	199,623	181,692	-9	2000 (396,598)	2006 (143,530)
Boats	8	9	+12	1997, 1998, 2001 (17)	1996 (3)
Buyers	4	3	-25	1997 (17)	2006 (3)
Trips	96	90	-6	1997 (242)	1996 (45)
Price (\$/lb)	4.36	4.04	-7	1999 (5.06)	2005 (3.92)

The number of boats participating in the fishery has been quite variable, increasing from 3 in 1996 to 17 in 1997 (as well as 1998 and 2001). In all other reportable years, 8–11 boats participated in the fishery. Annual participation averaged nine boats in recent years, 12% higher than the long-term average of eight boats.

The number of buyers quadrupled from four in 1996 to 17 in 1997, then declined to three by 2006. Buyer participation in the fishery averaged three in recent years.

The number of trips increased from 45 in 1996 to a high of 242 in 1997, then varied but generally declined to 86 trips by 2006. The average number of trips in recent years was 90, a 6% decline from the long-term average of 96.

Coonstripe shrimp is one of the higher priced (and lower volume) fisheries at Crescent City. Prices ranged from \$3.92 to \$5.06 per pound between 1996 and 2006. The average price in recent years was \$4.00 per pound, a 7% decline from the long-term average of \$4.36.

The Albacore Troll Fishery

Albacore tuna is a highly migratory species whose distribution varies widely. Oceanic

conditions such as warm water currents (particularly El Niño events) and availability of prey affect their migration. Albacore can range within 10 to 50 miles of the coast or further offshore and from south to well north of Crescent City. With the closure of the last large California cannery in 2001, most fishery participants market their catch through direct sales or deliver to one of the few remaining canneries in Oregon or Washington. As a result, participation and production at Crescent City can vary widely from year to year.

Average annual landings of troll-caught albacore in recent years and over the long term have been about the same, at 237,548 and 227,318 pounds respectively. Ex-vessel value averaged \$205,065 and \$237,388 over the same periods (Figure 14, Table 14). The apparent stability in these average estimates masks the high degree of inter-annual variability in the fishery. Years of peak landings (1982, 1994, 1996 and 1997) have largely coincided with El Niño events. In the remaining (reportable) years, landings and value ranged widely, from 24,051 to 306,734 pounds and from \$28,863 to \$539,836. The number of boats with albacore troll landings at Crescent City averaged 20 in recent years, down 23% compared to the long-term

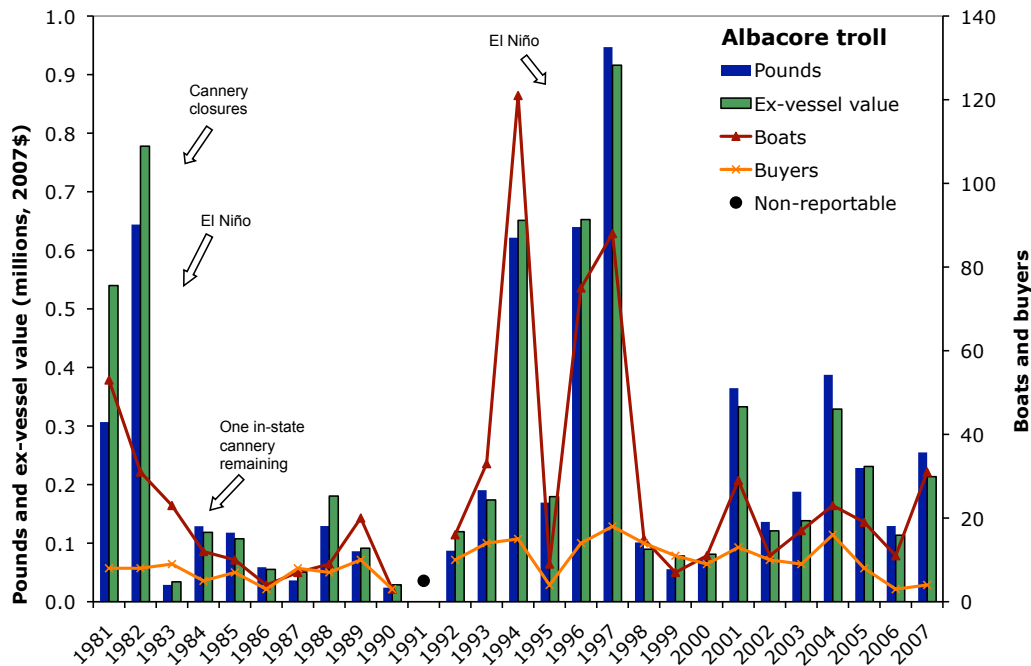


Figure 14. Landings, ex-vessel value (2007\$), and number of boats and buyers for the commercial albacore troll fishery at Crescent City, 1981–2007. Note: Activity cannot be reported for 1991, when more than zero but fewer than three boats or buyers participated in the fishery.

Table 14. Long-term and recent annual average, percent difference, and highs and lows in selected measures for commercial albacore troll fishery at Crescent City, 1981–2007. Note: Years when fewer than three boats or buyers participated are included in averages, but excluded from highs and lows.

Albacore troll	Long-term	Recent	Percent difference	High year(s) (amount)	Low year(s) (amount)
	average 1981–2007	average 2003–2007			
Landings (lbs)	227,318	237,548	+5	1997 (946,945)	1990 (24,051)
Ex-vessel value (\$)	237,388	205,065	-14	1997 (916,055)	1990 (28,863)
Boats	26	20	-23	1994 (121)	1990 (3)
Buyers	9	9	+0	1997 (18)	1986, 1990 (3)
Trips	58	41	-29	1994 (271)	1990 (3)
Price (\$/lb)	1.10	0.86	-21	1981 (1.76)	2003 (0.74)

average of 26 boats (Table 14). The number of trips averaged 41 in recent years, a 29% reduction from the long-term average of 58 trips. Peak years of boat activity included 1994 (121 boats) and 1996–1997 (75–88 boats), with 3–53 boats participating in other years. The number of trips peaked in 1994 (271 trips),

1997 (237 trips) and 1996 (142 trips), with 3–74 trips occurring in other years (Table 14).

An average of nine buyers participated in the albacore fishery in recent years and over the long term (Table 14). The number of buyers was highest (14–18) in 1993, 1994 and from

1996 through 1998, and included both low- and high-landing periods. These numbers included an estimated six fishermen who sell at least some of their catch directly to the public in late summer and early fall as a strategy for dealing with the scarcity of canneries and stagnant prices.

Annual ex-vessel prices for albacore landed at Crescent City averaged \$0.86 per pound in recent years, a 21% reduction from the long-term average of \$1.07 (Table 14). Recent term prices have been generally lower and more stable (\$0.74–\$1.01 per pound) than prices in previous years (\$0.89–\$1.76 per pound).

On average, 13% of boats delivering to Crescent City in recent years have been albacore boats, an increase from the long-term average of 7%. However, in terms of other measures of fishing activity, albacore has accounted for an average of only 1%–2% of total trips, landings and ex-vessel value in Crescent City (both over the long term and in recent years).

The Pacific Whiting (Hake) Trawl Fishery

The whiting trawl fishery is the largest fishery by volume on the U.S. West Coast. However, only a small portion of the annual harvest is taken in California, as the stock has a limited window of availability (due to its northward migration in late spring) and whiting processors are largely concentrated in Oregon.²⁶ The fishery has been among Crescent City's top two by volume, accounting for 14% and 26%, of landings in recent years and over the long term, respectively. However, whiting has accounted for only 2% and 1% of ex-vessel value over those same periods and currently involves no resident vessels. Nonetheless, it supports receivers and other businesses during an otherwise slow period at the port.

Because of the small number of participants, data on the fishery can only be reported for seven individual years: 1985, 1990, 1993 and 1997 when reportable landings occurred, and 1981, 2002 and 2005 when no landings were made. Landings averaged 6.3 million pounds over the long term and 2.1 million pounds in recent years; ex-vessel value averaged \$407,496 and \$97,816 over the same periods. Among the four reportable years with positive landings, landings peaked in 1997 at 13 million pounds and value peaked in 1990 at \$859,000.

Except for 1997 when eight boats (3% of all boats that landed at the port) participated, five or fewer boats participated in the fishery at Crescent City. Similarly, three or fewer buyers received whiting locally.

The number of whiting trips at Crescent City averaged 59 over the long term, dropping 75% to an average of 15 per year in recent years. These trips account on average for well under 1% of trips at Crescent City in most years, although they accounted for 2% of all trips in 1997. Ex-vessel prices for whiting have consistently been the lowest for all fisheries at Crescent City, at \$0.15–\$0.16 per pound in 1982 and 1983 and less than \$0.12 per pound in all subsequent years. Price per pound averaged \$0.07 in recent years, a 13% reduction compared to the long-term average of \$0.08.

Commercial Fishery Combinations

Commercial fishery participants move among fisheries, ports and fishing areas in response to changes in resource availability, regulations, weather and other factors. Reflecting the highly constraining nature of regulations in recent years, one fisherman noted, "You follow the seasons, the regulations, not so much the fish." Examination of fishery combinations provides insight into the changing nature of individual operations as well as the community.



For purposes of identifying trends in fishery participation, it would be reasonable to focus on boats that are resident (homeported) at Crescent City. However, although recent data on resident vessels were collected as part of the fieldwork for this project, similar data for earlier years are not readily available. Thus, in lieu of focusing on resident vessels, we focused on those boats that earned a plurality (i.e., the greatest proportion) of their annual ex-vessel revenues from landings at Crescent City (hereafter referred to as ‘Crescent City vessels’). While there may be some

coincidence between port of residence and the port accounting for plurality of revenue, one is not necessarily a good proxy for the other. We identified 32 one-, two-, three- and four-way fishery combinations common to these Crescent City vessels during three periods: 1981–1983, 1993–1995 and 2005–2007 (Figure 15, Table 15). In Figure 15, the numbers in each box indicate the average number of vessels per year that participated exclusively in that fishery in each period. For example, an annual average of 207 boats participated only in the salmon troll fishery during the first period (1981–1983), none participated only in this fishery during the second period (1993–1995), and an average of fewer than three participated during the most recent period (2005–2007). The numbers on the lines connecting two boxes indicate the average number of vessels that participated exclusively in the fisheries denoted by those two boxes. For example, the line connecting

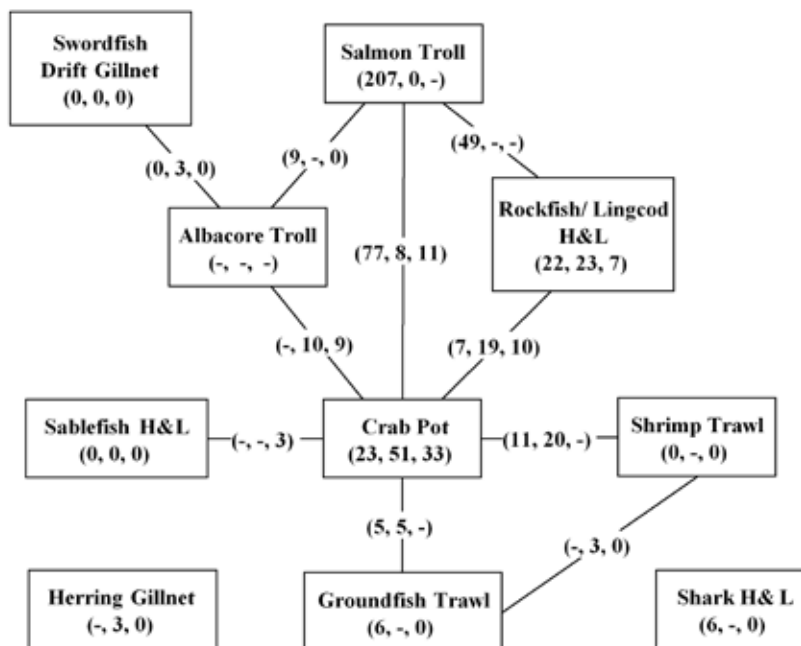


Figure 15. Major one- and two-way fishery combinations utilized by Crescent City boats based on three-year averages for 1981–1983, 1993–1995 and 2005–2007. Note: “-” indicates fishery combinations involving only one or two boats, and cannot be reported because of confidentiality rules.

Table 15. Major three- and four-way fishery combinations utilized by Crescent City boats in each of three periods. Note: “-” indicates fishery combinations involving only one or two boats, and cannot be reported because of confidentiality rules.

Fishery Combination	1981–1983 Average	1993–1995 Average	2005–2007 Average
Salmon Troll - Crab Pot - Albacore Troll	21	3	9
Salmon Troll - Crab Pot - Rockfish Hook-and-Line	30	4	0
Groundfish Trawl - Crab Pot - Salmon Troll	6	0	0
Groundfish Trawl - Crab Pot- Shrimp Trawl	5	12	-
Albacore Troll - Crab Pot - Shrimp Trawl	5	5	0
Albacore Troll - Crab Pot - Rockfish Hook-and-Line	3	9	-
Albacore Troll - Crab Pot - Groundfish Trawl	-	3	0
Albacore Troll - Shrimp Trawl - Rockfish Hook-and-line	-	3	-
Rockfish Hook-and-line - Sablefish Hook-and-Line - Crab Pot	0	4	-
Rockfish Hook-and-line - Crab Pot - Shrimp Pot	0	0	3
Swordfish Drift Gillnet - Shark Gillnet – Albacore Troll	0	3	0
Salmon Troll - Crab Pot - Albacore Troll - Rockfish Hook-and-Line	-	3	-

the salmon troll and crab pot boxes indicates that an annual average of 77 vessels participated in both the salmon and crab fisheries (only) during the period 1981–1983, 8 did for the period 1993–1995, and 11 did for the period 2005–2007.

Several fishery combinations pursued in the early 1980s no longer occur at all (or sufficiently to report). Among the most notable changes are the reductions in salmon troll-only, groundfish trawl-only, rockfish/lingcod hook-and-line/pot-only, salmon troll combination, and groundfish trawl combination vessels. The numbers of operations that fish for crab only or in combination with other fisheries have not necessarily increased in absolute terms, but have assumed greater prominence following declines in other fisheries. One new combination is that of crab pot together with rockfish/lingcod hook-and-line and shrimp pot, two smaller fisheries directed toward the live market. Study participants discussed several of these fishery combinations, often highlighting one of three fisheries as their main fishery and two others they depend (or depended) on to fill out their annual round. They also noted shifts within and across fisheries such as the following:

As the groundfish fishery became more regulated and trip limits onerous, ... the fleet started to shift into other things such as crab... and shrimp came back, too, so you had a diverse mix then. Also the larger salmon vessels moved into groundfish and crab. So there was a lot of effort just 'sloshing around' among fisheries.

Some Crescent City commercial fishery participants also move among ports to follow the fish, avoid dangerous weather and access fishery support businesses not available locally. For example, groundfish trawl fishermen reported traveling as far south as San Francisco and as far north as Washington. When targeting shrimp, trawlers also range widely, from Westport, Washington to Ft. Bragg – seeking harvest opportunities in areas and times that are not closed by regulation. Those who fish for albacore start the late summer season fishing far offshore of Newport, Oregon, where they deliver their catch, then follow the fish as they move south toward Crescent City in September and San Francisco by October or November. Most salmon fishermen

travel due to the much more limited fishery openings locally, working especially off San Francisco or Coos Bay, Oregon. During crab season, most fishermen stay in the area to fish, although some local fishermen participate in the southern crab season opener off San Francisco. Coonstripe shrimp and rockfish hook-and-line fishing are focused locally. Because the catch is perishable and the time and fuel costs associated with transiting by sea is considerable, those who travel to fish usually deliver to a port near the fishing grounds either to a buyer who operates at Crescent City or to a different buyer.

Revenue Per Boat

Trends in aggregate revenues do not necessarily correlate with how individual vessels may be faring in terms of revenue. To illustrate this point, we estimated average annual revenue per boat for Crescent City boats (defined as boats that earned a plurality of their ex-vessel revenues from landings at Crescent City). The number of Crescent City boats was 353–540 (average=475) between 1981 and 1984, declined to 102–301

(average=201) between 1985 and 2002, then declined further to 88–122 (average=110) thereafter. Over these same periods, revenue per boat increased from \$32,100–\$41,300 (average=\$37,600) to \$73,100–\$121,200 (average=\$88,500) to \$77,400–\$216,200 (average=\$161,400); (Figure 16). The increase in average annual revenue per vessel between 1985 and 2002 can be traced to the marked reduction in the number of small-revenue salmon trollers in the early 1980s. The more recent revenue increase (since 2003) is largely due to unusually high crab landings during that period.

To better understand how vessel revenue is affected by an individual’s participation in particular fisheries, we assigned each Crescent City boat to its ‘principal fishery’, that is, the fishery from which the boat derived the plurality of its annual revenue. For vessels associated with each principal fishery, we then estimated average annual revenue per boat (based on their landings in all fisheries at all West Coast ports). Estimates for three-year periods over the last three decades indicate a decline in the number of Crescent

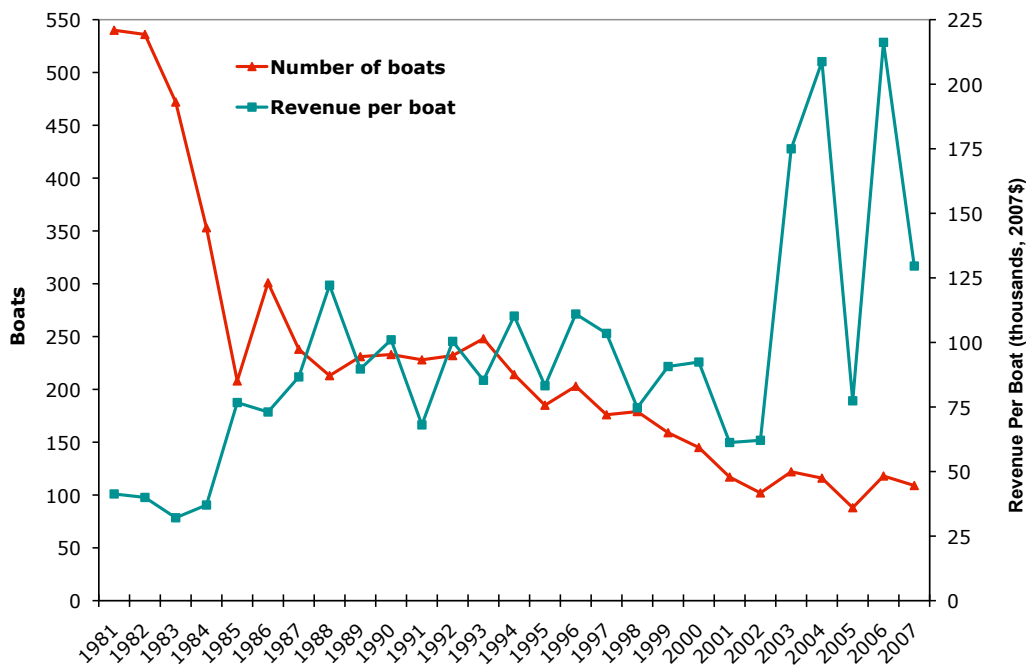


Figure 16. Number of boats that earned a plurality of their revenue from landings at Crescent City, and average annual (total West Coast) revenue per boat, 1981–2007.

City boats and an increase in revenue per boat (Table 16). This trend is evident in the crab, salmon, rockfish/lingcod, and groundfish trawl fisheries. Revenue per boat varies considerably among fisheries, and is higher for crabbers and groundfish trawlers than for salmon and rockfish boats, which tend to be smaller and have less

capacity. Whether these patterns are indicative of future trends is uncertain, given the high degree of variability experienced in these fisheries and in other fisheries included in the revenue estimates. It is also unclear whether increases in revenue per boat have kept pace with increasing costs.²⁷

Table 16. Average annual number of Crescent City boats and average annual revenue per boat (2007\$), by major fishery and overall, 1981–1983, 1993–1995 and 2005–2007. Note: From 2005 through 2007, at least three unique boats participated in the groundfish trawl fishery, however fewer than three participated in the shrimp trawl fishery.

Major Fishery	Average Number of Boats			Average Annual Revenue Per Boat (All Ports, All Fisheries)		
	1981– 1983	1993– 1995	2005– 2007	1981–1983	1993–1995	2005–2007
	Crab pot	127	127	82	\$ 71,258	\$ 64,939
Salmon troll	293	3	3	\$ 6,845	\$ 46,929	\$ 54,193
Rockfish/lingcod hook-and-line	36	33	13	\$ 4,057	\$ 9,140	\$ 32,818
Shrimp trawl	11	19	-	\$270,946	\$247,187	-
Groundfish trawl	16	12	2	\$263,364	\$285,841	\$298,943
Albacore troll	7	3	3	\$ 94,927	\$ 64,242	\$ 98,105
All Boats	516	216	105	\$ 37,799	\$ 92,930	\$141,067

RECREATIONAL FISHERY ACTIVITY AT CRESCENT CITY HARBOR

Historically, Crescent City harbor supported extensive ocean recreational fisheries, with a particular focus on salmon. According to study participants, both coho and Chinook salmon fishing were significant from the 1960s into the early 1990s. According to a 1991 survey of ocean salmon sport fishermen in the KMZ, 86% (337 of 388 respondents) self-reported as seasonal visitors, 13% as local residents, and 1% as short-term tourists (Waldvogel 1992). Approximately 67% of respondents stayed at local RV parks, 13% stayed at local campgrounds, and 4% stayed at local motels. Most (68%) used the harbor's berthing facilities for their boats, while 17% used launch ramps to launch their boats daily. These study results suggest the presence of an active recreational fishery at the harbor with a high proportion of nonresident anglers contributing to local economic activity. Although port-specific data are limited, these use patterns clearly changed following the sharp reduction in recreational salmon fishing opportunities soon after the 1991 survey was completed.

Groundfish, especially rockfish and lingcod, is the other major species group targeted by marine anglers at Crescent City. Study participants reported that this fishery is secondary to salmon, but that it still affords an opportunity to get out on the water and fish. Many local anglers also participate in recreational fisheries for crab in the winter. Fewer fishermen participate in the recreational albacore fishery in the late summer and early fall, and then only if the resource is within about 10 miles of the coast. Although specific estimates of recreational groundfish effort are not readily available, regulations have undoubtedly contributed to a decline in groundfish catch and effort over the past decade.²⁸

Recreational Fishing Effort

Recreational fishery information specific to Crescent City is limited. Port-specific estimates of effort and harvest estimates are available from CPFV logbooks but cannot be fully reported for Crescent City, due to confidentiality requirements. Salmon effort and harvest estimates for the area are available from CDFG's Ocean Salmon Project (OSP). Effort and harvest estimates (all species) are available from CDFG's California Recreational Fisheries Survey (CRFS), but only at the 'district' level.²⁹ Information about other aspects of local recreational fishing activity provided here is based on fieldwork conducted in 2007 and 2008.

According to the CRFS, an annual average of 143,000 angler trips³⁰ were made in the Redwood District (which comprises Del Norte and Humboldt counties, excluding Shelter Cove) during the period 2005–2007. About 31% of these trips were from private boats, 34% from manmade structures, 32% from beaches and banks, and 3% from charter boats. The dominance of private relative to charter boats at the district level is also characteristic of the Crescent City recreational fishery. According to the OSP, recreational salmon effort in the Crescent City area declined from 14,000–52,100 angler trips between 1981 and 1991 to 3,300–15,400 trips between 1992 and 2002. Effort declined further to 1,500–3,200



trips during the period 2003–2007. The average annual number of salmon trips in the recent term is 86% less in the private boat fishery and 84% less in the CPFV fishery compared to the long term (Table 17).

The dominance of private boat relative to charter boat activity indicated by the CRFS Redwood District estimates is also apparent from OSP. According to OSP, the proportion of recreational salmon effort in the Crescent City area coming from charter boats was 1%–5% during the period 1981–1994 and has declined to less than 1% most subsequent years.



Table 17. Long-term and recent annual average, percent difference, and highs and (nonzero) lows in the number of recreational ocean salmon trips at Crescent City, 1981–2007 (PFMC 1997, 2009).

Mode	Long-term average 1981–2007	Recent average 2003–2007	Percent difference	High year(s) (amount)	Low year(s) (amount)
Private boat	16,000	2,300	-86	1987 (50,600)	2006 (1,500)
CPFV	600	100	-84	1985 (1,600)	1992, 1995, 2000, 2004 (100)
All boat	16,400	2,300	-86	1987 (52,100)	2006 (1,500)

KEY FACTORS AFFECTING CRESCENT CITY FISHERIES

Crescent City's fisheries and fishing community have experienced considerable social and economic change over the past 30 years. Regulatory, market and environmental factors have influenced individuals and communities, sometimes gradually and at other times more abruptly, as with the devastating 1964 tsunami. These factors do not operate in isolation; rather, they often interact in complex ways. As one study participant summarized:

When I arrived [in 1964], there was no boat basin. The biggest boat was 52 feet. The biggest impact was with the boats from the East Coast in the 1970s. With the [Farm] Credit Act, fishing was viewed as farming. I saw it as an opportunity, but it wasn't. Single riggers (trawlers) ... were replaced by double riggers with two nets. They got more sophisticated and more educated [and] depleted the resource. You didn't need more than a license to get in. It was great back then. Then they needed to move toward a permit.

Community members highlighted several factors that have shaped local fisheries, infrastructure and the community as a whole (Table 18). Some of these factors originated locally, while others are regional, national or even international in nature. Moreover, these forces do not operate in isolation. Rather, they interact in complex and cumulative ways, posing both challenges and opportunities to the viability and resilience of the community. The discussion that follows focuses on those factors highlighted by study participants as having most influenced local fisheries, infrastructure, and the community as a whole.

A Watershed Event, Expansion and Contraction

The 1964 tsunami fundamentally changed the course of history for Crescent City and its fishing community. The devastation evoked national sympathy and catalyzed the community, paving the way for it to obtain federal funding to build a more extensive harbor. In a relatively short time, Crescent City's fishery-support infrastructure was significantly improved, and provided one among many incentives at that time for local fishery expansion. According to one study participant:

Before the boat basin, fishing boats had to anchor out (in the outer harbor), and fishermen rowed out to them every morning to go fishing or work on the boat. With the new boat basin, their life became a lot more convenient; the fish plants gave them a better place to sell their catch; and the haul-out facility made it easier to repair (or build) their boats. All of this made it easier and more lucrative to be a fisherman in Crescent City, and contributed to an atmosphere where investing in a fishing boat was 'the thing to do'. Even some local loggers and real estate brokers were buying boats in the late 1970s. I don't know of any other port on the West Coast where so much public investment in commercial fishing occurred in such a short time.

The 1970s into the late 1980s were 'boom years' for Crescent City, as they were for many other fishing communities along the West Coast. Expanding markets and incentive programs such as the Capital Construction Fund and Fishing Vessel Obligation Guarantee Program fueled the expansion not only of

Table 18. Key factors and their effects as identified by Crescent City fishing community members and augmented by other sources.

Factor/Event	Effect on Fisheries and Community
<i>Environmental</i>	
1964 Tsunami	Massive destruction and loss of 11 lives Fishery activity temporarily suspended Community action to obtain funding for rebuilding Vastly improved fishing infrastructure
1982–1983 El Niño	Decreased abundance of shrimp Effort shifts to groundfish and crab
2006 Tsunami	Substantial damage to aging slips and other infrastructure Acquisition of external funding to rebuild
<i>Regulatory</i>	
1976 MSA and incentive programs	Increased fishing and receiving capacity Increased catch of many species Expanded and enhanced harbor infrastructure Increased social and economic activity Enhanced sense of opportunity and well-being
Limited entry programs Salmon (1982) Groundfish (1994) Shrimp trawl (1994) Whiting trawl (1994) Crab (1995) Nearshore (2002)	Pre-implementation spikes in participation Decreased participation in some fisheries (e.g., salmon) Effort shifts among fisheries For those qualifying: transferable asset, increased security For those not qualifying: loss of flexibility, real and/or perceived economic loss
Salmon management (Commercial: 1982–present, Ocean recreational: 1991–present) KMZ and statewide limits/closures Coho limits/prohibitions Reallocation among sectors	Effort shift to other areas and/or fisheries Exit from fishery Decreased fishing and offloading Reduced use of fishery-support businesses Reduced revenue and employment Economic and psychological stress Loss of community Change of identity
Groundfish management Quotas, cumulative trip limits (1994–present) Groundfish disaster (2000) Federal trawl buyback (2003) Rockfish conservation areas (2002–present)	Decreased fishing and offloading Effort shifts among species groups, areas and fisheries (esp. crab) Reduced receiving and local processing Reduced use of fishery-support businesses Reduced revenue and employment Increased costs to harbor (abandoned vessels) Change of identity
Shrimp trawl management Bycatch reduction devices (2002) Closure of northern state trawl grounds (2008)	Increased catch efficiency/reduced waste Effort shifts among species groups, areas and fisheries
Marine Life Protection Act process (late 2009–present)	Concern and mistrust Increased uncertainty about access to resource Reluctance to invest in fishing, receiving and other support businesses
<i>Economic</i>	
Increased costs Insurance/Workman’s Comp Fuel prices (summer 2008)	Reduced use of goods and services Increased uncertainty Decreased quality of life Concerns about viability, future
Market Challenges Market shifts Stagnant/declining prices	Effort shifts Increased uncertainty
Macroeconomic conditions Recent downturn	Reduced use of goods and services Reduced revenue and employment

fishing, receiving and processing capacity, but also the businesses that supported them. However, this era of expansion gave way to contraction as growing concerns over the health of many commercially and recreationally important species prompted increasingly stringent regulation in several fisheries.

Changing Fisheries, Changing Community

The ocean salmon fishery was the first of many to be restricted amid growing concern about the health of fish stocks, in this case Klamath River fall Chinook. With the implementation of limited entry for the troll fishery, reductions in season length especially in the KMZ, the increased harvest allocation to the Tribes (Pierce 1998), and recent statewide closures of the fishery, commercial salmon fishing at Crescent City has gone from a central feature of the port to almost nonexistent today.

The situation in the recreational fishery is similar. As of the late 1970s when harbor enhancements were completed, recreational salmon fishing involved some 500 boats in seasonal slips and as many as 100 more on moorings in the harbor's outer basin. The recreational fleet included out-of-towners as well as locals. Retirees, school teachers and others would trailer their salmon boats to the harbor and stay for weeks or the entire summer to fish. Some even bought commercial licenses to be able to land more fish and offset their expenses. Many stayed at local RV parks at the harbor or elsewhere in town. A distinctive culture associated with this fishery grew over time, as participants returned year after year and built strong social networks in the community.

After the implementation of limited entry in 1982, which made commercial fishing untenable for many part time fishermen, activity dropped. Subsequent sharp reductions in the length of the KMZ commercial salmon

season led to economic and social losses (PFMC 1985). Some fishing community members remarked that for Crescent City the salmon disaster occurred not in 2006 or 2008 as noted in statewide news, but rather in 1985 when the KMZ was first closed for the season.

In response to the changes of the early 1980s, those who remained in the fishery shifted their effort south or north of the KMZ, where the salmon fishing season remained open considerably longer. Others shifted their effort to other fisheries such as groundfish, shrimp or crab. Many others left fishing altogether. This loss of fishing activity led to reduced demand for goods and services and reduced revenues for fishery-support businesses including gear supply stores, fuel and ice providers, RV parks and motels that housed visiting fishermen and their families, and others. In addition, it signaled a change in community relationships and identity that had been largely shaped by the bustling summer salmon season.

A major change occurred in the recreational fishery in 1992, when the season in the California KMZ was cut from more than four months to 14 days. According to study participants, the 14-day season was a disaster for fishery participants and the community. At that time, an estimated 400–600 sport fishing boats participated in the local summer salmon fishery, many of them coming from out of town and staying for a month or more to fish daily. According to one participant who then ran a local fishery-support business (which soon closed for lack of business), the number of summer recreational fishery participants dropped by about 50% in response to the closure. From 1993 to 2007, the season ranged from 1.5 to 4 months, a notable improvement over 1992 but much shorter than the 4- to 9-month seasons that prevailed prior to 1992.

While Crescent City is subject to similar regulations as other KMZ ports such as

Eureka and Trinidad, the decline in its salmon fishery has been disproportionate relative to the KMZ as a whole. For instance, during the period 1981–1983, Crescent City accounted for an average of 34% of total salmon effort (angler days) and 30% of salmon landed in the KMZ commercial fishery; by 2005–2007 its contribution to total effort and landings dropped to 7% and 11% respectively (PFMC 1997, 2009). Crescent City’s contribution to effort and landings in the KMZ recreational fishery fell from 20% and 19% respectively during the period 1981–1983 to 7% and 5%, respectively, by the period 2005–2007.

As the fishing community was acclimating to new rules in the ocean salmon fishery, other events induced further change in the system. The 1982–1983 El Niño had a dramatic effect on many California fisheries including salmon, groundfish and shrimp (CDFG 1984, 1985). Many Crescent City fishery participants observed major ecosystem shifts such as changes in the distribution of certain rockfishes, decreases in the size of salmon, and the scarcity of pink shrimp after several strong years (Percy and Schoener 1987, Woodbury 1999). In response to these ecological changes, fishermen shifted their effort to other more readily available species. Many shrimp fishermen modified their trawlers and began to target groundfish and/or shifted to crabbing. As one participant noted:

Virtually the entire West Coast shrimp fleet shifted in to the groundfish trawl fishery. Before 1982–83, there was a shrimp fleet and a groundfish fleet... when shrimp nearly disappeared due to the El Niño, the two fleets became indistinguishable.

Contractions in commercial fishing activity, particularly with respect to the high-volume groundfish and shrimp fisheries, have impacted local receiving and processing infrastructure

as well as the harvesting sector. For example, Castle Rock Seafood, a local processor since the mid 1970s that was bought out by a fishermen’s cooperative beginning in 1995, ceased operations in 1997. Consolidated Factors/Sea Products closed in 2000, and in 2001 one of the largest processors on the West Coast, Eureka Fisheries, ceased operations.³¹ Although these business closures cannot be directly linked to reductions in fishing activity, it stands to reason that reduced poundage going across the docks and into these facilities (paying for machinery, receiving and processing labor, wastewater treatment, and product distribution) had a substantial negative impact on the viability of those businesses.

Economic Factors and Impacts

For commercial and charter fishing operations, costs include fixed items such as vessels, gear and equipment (for navigation, safety and maintaining the quality of the catch), slip fees, permit fees, insurance and general vessel maintenance. They also include variable (operating) costs such as fuel, ice and other provisions, as well as crew. For recreational fishery participants, fixed costs include most of these items (except, for example, crew), although they tend to be considerably lower. Fish buyers and processors, support businesses and the harbor likewise have fixed and variable costs including facilities, equipment, labor (and associated costs such as workers’ compensation insurance), supplies, and maintenance, repair and services needed to keep their operations functioning safely and effectively.

Commercial Fisheries

Commercial fishery participants and support business operators cited rising operating costs, especially those for gear, vessel maintenance, insurance and fuel, as among the biggest challenges they are facing. One trawl fishery participant reported (in May 2008), “We’re on really tight margins, especially fuel. It used to

be about 7% of gross, now it's 26%...but the fish price is just the same." Another participant commented, "Fuel has gone from \$0.85 a gallon to \$4.05 a gallon, and the price of fish is not keeping up. The high fuel cost means you really can't scratch [go looking for fish]. The cost used to be time; now you go into the red. You don't take the risks." According to the Pacific States Marine Fisheries Commission's (PSMFC) annual West Coast Marine Fuel Price Survey, average pretax fuel prices at Northern California ports increased more than three-fold from \$1.00 per gallon in December 1999 to \$3.19 in December 2007, and about 21% between January and December 2007 (PSMFC 2000, 2008).

At the same time, many commercial fishermen commented on stagnant or declining prices in several fisheries. Our analysis comparing average annual prices for the recent term and the long term suggests this is indeed the case for the shrimp trawl (-33%), albacore (-21%), whiting (-13%), crab (-11%) and shrimp pot (-7%) fisheries. In the shrimp and whiting trawl fisheries, market competition was cited as a cause of the decline. Study participants cited, for example, competition with Canadian shrimp beginning in the early 1990s. The drop in crab prices may be attributed to the substantial growth in crab production with the majority of landings still being purchased for the lower price cooked (rather than live) crab market.

At the same time, prices have increased for some fisheries, including rockfish hook-and-line (+82%), salmon (+13%), and groundfish trawl (+5%).³² The price increase for rockfish is likely due to the growth in markets and distribution channels for live product in the San Francisco Bay area. Salmon troll prices have increased in years following a long period of decline, which has been attributed to the growing supply and popularity of farmed salmon in both domestic and international

markets (Sylvia et al. 1998). Recent price increases may be attributed to the development of localized niche markets for wild (versus farmed) salmon.

Fish buyers and processors raised similar concerns about rising costs, including those for utilities (power and sewer) and labor-related costs (such as workers' compensation insurance), especially compared to nearby Oregon ports where state and local laws differ. Several discussed the problems posed by the harbor's wastewater treatment plant, noting the ongoing issues with its operation and high costs, and its effects on harbor operations and opportunities for seafood processing at Crescent City.

Increasing costs and less favorable economic conditions also have affected fishery-support businesses, both directly and indirectly. The reduction in fishing opportunities and activity has resulted in reduced demand for goods and services that these businesses provide. A key fishery-support business, Englund Marine, has experienced reduced demand for salmon and groundfish gear and increased demand for crab gear, as well as a general shift toward more recreational (salt and freshwater) business:

We used to sell primarily commercial salmon troll gear. We used to have a big bait freezer, but no longer. In the early 1990s, we started selling more sport gear....In earlier days it was probably 60/40 commercial to recreational (inventory). Now it's more like 70% recreational inventory. We've completely restructured the store in the last year to adapt to the changes.

As local fisheries expanded in the 1980s, a shaved ice plant was built on Citizens Dock to supplement local block ice production to meet the growing demand from shrimp and groundfish trawlers. Both plants operated

from 1987 until 1994, when the block ice plant closed. Since then, only the Citizens Dock plant, operated by Pacific Choice Seafood since 2003, has provided ice for sale to the public. However, the groundfish trawl buyback has affected the ice plant, which has reduced its staff and operations following a sharp reduction in demand: “The ice house was a two-person job. I’d work 10 pm to sunrise, and the other guy would take over. Now it’s open 8 to 6 and there are hardly any customers... We’re lucky to sell 50 tons in a month.” The remaining trawlers and other fishery participants need ice for their fishing operations, and are concerned about the plant’s long-term viability.

Shifting demand and markets for seafood also have influenced Crescent City fisheries, especially those for pink shrimp, live fish, coonstripe shrimp, and crab. Technological changes in the 1960s and 1970s afforded economies of scale in the pink shrimp fishery, increased production and expanded access to markets. After recovering from the 1982–1983 El Niño, the fishery grew again until the early 1990s when prices dropped due to competition from Canadian shrimp. In response, Crescent City fishermen report that they shifted effort to the groundfish and crab fisheries. According to one participant:

Dragging picked up in the late 1990s because the shrimp market went down. In years where shrimp were abundant and the price was good, draggers would shrimp. When the shrimp market went down, they switched over to dragging. You could lease a trawl permit if you didn’t have one.

Even as the price for pink shrimp declined, demand for live seafood – including rockfish and other groundfish species, coonstripe shrimp and crab – grew. Some study participants suggested that the arrival of

Vietnamese refugees in the late 1970s and 1980s, followed by more general growth in the San Francisco Bay area Asian population, was a driving force behind the emergence of the live rockfish fishery. The live fish fishery, which had begun in Southern California in the late 1980s, had spread north and into the Crescent City area by 1999. Hook-and-line fishermen who had been supplying the local and regional filet fish market found they could earn several times more per pound for live rockfish. In the early years of the live fish fishery at Crescent City, Bay area buyers would travel to Crescent City to buy the fish off the boats. A small group of Crescent City fishermen worked together through a cooperative to market their catch, although the group disbanded after about a year. At present, two resident buyers handle some of the catch, and a few local fishermen transport their catch to Bay area wholesalers, restaurants and markets. Although the coonstripe shrimp fishery involves a different group of local fishermen, that group similarly took advantage of the growing Bay area demand for live seafood.

The market for live crab has grown as well. Historically, the fishery was directed primarily toward the production of whole and sectioned cooked crab for institutional food service and other similar high volume uses. In the early 2000s, however, the demand for fresh, live crab increased. Although the majority of crab landed at Crescent City still is processed, study participants report that the live market has put some upward pressure on ex-vessel prices and accommodated production after the first month of the season, when 80% of the northern California catch is typically landed (Leet et al. 2001). (The ex-vessel price for live crab is about twice that for processed crab; although demand is smaller, it lasts well into the season.)

Finally, the local demand for seafood at Crescent City has influenced and been affected by local fisheries. Some locally caught seafood has been sold via off-the-boat and other direct sales by fishermen, a local vendor (Lucy's Seafood) during crab season and, through the 1990s until it closed, by Eureka Fisheries at the harbor. However, local demand for fresh commercially caught seafood has been limited because of Crescent City's small population, isolation from larger urban centers (and "limited foot traffic," as one participant noted), and the tendency of many residents to catch their own seafood.

Recreational Fisheries

Recreational fishery participants highlighted the general economic downturn for its dampening effect on Crescent City's recreational fisheries over the past several years. They also cited rapidly rising fuel prices at the time of the study, noting that they and other recreational fishermen were "carpooling," with two or more anglers fishing from one boat to share fuel costs. In addition, Crescent City Harbor increasingly competes with the port of Brookings, Oregon, where fewer restrictions, lower fuel prices and the absence of sales tax reportedly have attracted some anglers who used to fish out of Crescent City.

Among fishery-support businesses oriented toward recreational fisheries, several have faced challenges as fishing opportunities have changed. One former business owner discussed the impacts of the Klamath-driven recreational salmon fishery cutbacks of the early 1990s. In the late 1980s, the recreational ocean fishery was very active. Local recreational fishery support businesses were thriving, with record gear sales and other activity: "The launch ramp between Fashion Blacksmith and the harbor was backed up. Folks came from Redding, Anderson, Cotton, Fresno...They'd spend the winter in Yuma and the summer in

Crescent City." When the fishery was sharply curtailed in 1991, however, "Recreational fishermen left in droves. The harbor had a plan to build 500 more slips...It was a blow to the entire community." Over the next few years, as recreational fishing activity at the harbor continued to decline, many local fishery-support businesses closed or shifted their focus to be less dependent on recreational fishing activity. However, in recent years some businesses have begun to carry more recreational gear to make up for a decline in commercial activity.

The recent economic downturn coupled with declining local fishing opportunities is evident as well. For example, one of the local RV parks has experienced a shift from primarily seasonal (summer) recreational fishing enthusiasts to year-round nonfishing residents. According to the owner:

Fishing was great up until the late 1980s. We were full with recreational fishing folks. It's really the last three to four years that we began taking in other users. The regulars [who came for the fishing season] would fight over spaces....The fishermen are running late this year [2008, with the statewide salmon closure]. Usually, they're here by mid May. I've received 30 reservations for the summer; not many of them are fishermen.



The Harbor District

As fishing activity has declined over the last 30 years, so has the harbor's revenue base. Revenue sources include income from slip rentals and related services, fees for offloading commercially-caught fish and ice and fuel sales, and rent from other concessions (RRM Design Group 2006). In addition, the harbor district receives County property taxes (although these have been appropriated in part by the state in recent years) and various loans and grants from federal and state government agencies. At the same time, operating costs have become significant, particularly with respect to dredging the harbor channels and removing tailings, and maintaining and operating the wastewater treatment plant, which is required for fish processing. In addition, according to Harbormaster Richard Young, historically the harbor district made little or no provision for basic maintenance and repair of the docks or their replacement. As a result, these costs have grown. Harbor facilities also need to be brought up to code to meet Americans with Disabilities Act and other requirements, which add to their cost (RRM Design Group 2006, Madar 2009a).

Dredging

As with most California harbors, access into and out of Crescent City Harbor depends on maintenance dredging of its navigable channels and boat basins. The biggest obstacle to dredging the harbor has been adequate funding, for both the removal of dredged materials (spoils or tailings) and their disposal. The estimated cost to dredge the federal channel and the inner boat basin is \$2–\$3 million. Like most other harbors in California, Crescent City Harbor depends on Congressional appropriations to allocate funds to the Army Corps of Engineers for the work.

Over the past decade, the harbor has been dredged irregularly, once in 2000 and again in 2009 after conditions became critical. Portions of the federal navigation channel had depths as

shallow as two feet, where they are supposed to be at least 15 feet deep (Madar 2009b). As a result, most vessels had to wait for high tide to enter or leave the harbor, creating safety issues as well as economic costs.

A second obstacle has been securing a site for the disposal of dredged materials. For many years, Crescent City Harbor had access to an offshore disposal site. Following the closure of that site, the tailings were dried at its 5.3-acre dewatering site, then transported to the Del Norte County landfill. With the dewatering ponds full and the landfill closed to new materials, finding a cost-effective disposal site has posed a significant challenge. Recently, however, about three acres of Del Norte Solid Waste Management Authority excavation areas have been suggested as a possible dredge materials disposal site (Madar 2009c).

The November 2006 tsunami exacerbated shoaling and damaged the inner boat basin, especially G- and H-docks, where 35 slips were lost (Ma 2008). Although the initial assessment estimated repair costs at about \$5 million, subsequent investigations have estimated that as much as \$25.4 million may be needed to repair the tsunami damage and bring the inner boat basin up to code (Ma 2008). State and federal funds may be available for up to 75% of the cost, with local (harbor, city and/or county) funds required for the remainder. In June 2009, the harbor received a \$5 million Community Development Block Grant for the match (Madar 2009a).³³

Wastewater Treatment Plant

In 1992, Crescent City was awarded a federal grant to build a wastewater treatment plant, with the goal of accommodating up to five processing plants or 800,000 gallons of water per day. When the plant went online in 1993, three fish processing plants used it to pretreat waste from their operations, especially those for shrimp and groundfish. Due to a design

flaw, the plant produced strong odors that resulted in complaints from nearby business owners and residents. Eventually the problem was fixed. However, the cost of operating the plant became so great that in 1997, the City Council threatened to shut it down until a financial solution could be found. In 1998, the harbor district took possession of the plant, and resumed operations. By 2001, however, all three processors had gone out of business, due in part to high operating costs, including those associated with the wastewater treatment plant. Currently the one resident processor uses the wastewater treatment plant only during the height of the crab season (two to three months in the winter) and whiting season (two weeks in late spring). Operating costs continue to be extremely high, totaling an estimated \$110,000 per year (RRM Design Group 2006, Durkee 2008). These high costs and other issues associated with the plant have limited seafood processing and, according to some study participants, deterred other processors from establishing operations in the area.

Taken together, these factors have put a substantial financial strain on the harbor, particularly since its revenue has declined in recent years. The harbor district operated under a deficit beginning in fiscal year (FY) 1995–1996 (RRM Design Group 2006). The district relied on property taxes to cover this deficit, however these funds were insufficient, and the harbor district had significant debt until FY 2006–2007, when it showed a net profit of about \$230,000 (Crescent City Harbor District 2008). In 2008, the harbor district imposed additional fees on fish processors, raised mooring rates, and increased service charges and rents to reflect actual costs and match market rates (Young 2008). For FY 2008–2009, harbor staff projected a deficit of \$60,000, and expected cash reserves to cover the shortfall (Crescent City Harbor District 2008).

CURRENT SITUATION AND OUTLOOK

Crescent City Harbor's fishing community faces critical challenges as it continues to adjust to regulatory, economic and environmental change. Once highly engaged in a diversity of commercial and recreational fisheries, the fishing community has become particularly dependent on the commercial crab fishery, which is vulnerable to fluctuations in resource availability and, to a lesser extent, markets. Salmon troll and groundfish and shrimp trawl activity at the port have been sharply curtailed. Recreational fisheries, once highly dependent on salmon, now engage perhaps a tenth the number of anglers they did in the 1980s. Other sport fisheries for crab and groundfish continue, but have not filled the void left by salmon.

The reduction in fishing opportunities and activity have, in turn, reduced shoreside activity and associated revenues, which have been felt by fishery support businesses and the harbor itself. Moreover, because activity at the port is now highly concentrated during the winter crab season rather than spread throughout the year, many businesses, from fish buyers and processors to marine supply stores, have had trouble maintaining a consistent labor force and income flow. These same circumstances make it difficult for fishing operations to retain crew and maintain their vessels. Several businesses have closed or reduced services and/or inventory, while others have adapted by diversifying their operations. With limited alternative sources of revenue, harbor infrastructure including docks and other shoreside facilities, once considered state-of-the-art, have deteriorated.

Current issues for the fishing community include the implementation of marine protected areas (MPAs) through the state's ongoing MLPA process (in which several community members are actively engaged), and an individual quota program (IQ) for the federal groundfish trawl fishery. Both of these have the potential to fundamentally change local fisheries and the community. Study participants expressed concerns about the MLPA process and

its potential outcomes, especially reduced access to marine resources and increased safety risks. They noted that expectations about future MPAs have already created substantial unease in the community, and have affected choices related to investment in new boats, shoreside facilities and equipment. In addition, considerable uncertainty exists regarding the trawl IQ program, which is "intended to increase economic efficiency within the fishery and reduce the incidental catch of overfished groundfish species" (PFMC and NMFS 2010). However, some fishery participants are concerned that limited initial quota allocations for nontarget species will substantially reduce their fishing activity, with negative economic impacts on their operations and the community.

Taken together, these circumstances may undermine the viability and well-being of the Crescent City fishing community and the harbor. The situation is exacerbated by its isolation from larger population centers, and limited alternatives for local employment and community livelihood.

At the same time, the Crescent City community has a well-established history of adapting to change that may enable it to meet challenges in a constructive way. Community members have long worked together to support the harbor and its fisheries, as occurred with the building of Citizens Dock and its reconstruction following the 1964 tsunami. Recently, funds have been secured to begin much-needed dredging of the harbor's main navigation channel, and additional funds to support reconstruction of the inner basin and other improvements are pending. These efforts together with the port's location near rich fishing grounds, its safe and easy access, and the availability of key services (e.g., fuel, ice, haul-out, refuge) create the potential for Crescent City to regain its resilience and vitality as a fishing port.

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ENDNOTES

- ¹ <http://www.crescentcity.org>, accessed 6/1/09.
- ² Shore-based ocean, inland and river fisheries, clam digging and other collecting activities - both tribal and nontribal - are also integral to the community and the region, but are beyond the scope of this report.
- ³ See Appendix C for methodological detail.
- ⁴ Data sources include the Pacific Fisheries Information Network (PacFIN) database, the California Recreational Fisheries Survey (CRFS) and Commercial Passenger Fishing Vessel (CPFV) logbooks.
- ⁵ The Battery Point Lighthouse was deactivated in 1965 and re-activated in 1982; the St. George Reef Lighthouse was deactivated in 1975, and reactivated in 2002 (National Park Service 2009a, b).
- ⁶ According to Trice (1960), the fish companies at that time included California Shellfish Company, Paladini Fish Company, Tom Lazio Fish Company, and West Coast Crab Company. Hallmark Fisheries and Meredith Seafood also operated at Crescent City around that time.
- ⁷ See Appendix B for a glossary with definitions of this and other key terms used throughout this report.
- ⁸ http://www.dbw.ca.gov/PDF/Legis_Districts/Senate/SenDist04.pdf, accessed 6/11/10.
- ⁹ There was a fine line between the recreational and commercial fleets at this time, as many summer salmon anglers would purchase a commercial license to enable them to catch more fish and/or sell some of their catch to offset expenses.
- ¹⁰ The tribal allocation was upheld in *Parravano v. Babbitt*, 70 F.3d 539 (9th Cir. 1995), cert. denied, 518 US. 1016 (1996).
- ¹¹ The ‘spawner escapement floor’ is the minimum number of fish that are required to arrive at a natal stream or river to spawn, as identified in a management process.
- ¹² See Ralston (2002) for a discussion of the biology of West Coast groundfish and how growing understanding of that biology affected PFMC management.
- ¹³ Pacific ocean perch, bocaccio and lingcod were declared overfished in 1999, canary rockfish and cowcod in 2000, darkblotched and widow rockfish in 2001, and yelloweye rockfish in 2002. Lingcod was declared rebuilt in 2005.
- ¹⁴ Vessel monitoring systems are electronic transmitters placed on fishing vessels that transmit information about a vessel’s position to enforcement agencies via satellite to determine, for example, whether a vessel is in a closed area (<http://www.pcouncil.org/groundfish/gfvms.html>, accessed 12/7/09).
- ¹⁵ http://www.dfg.ca.gov/licensing/pdffiles/cf_items_10yr.pdf, 4/30/10, accessed 6/4/10; <http://www.dfg.ca.gov/licensing/commfishbus/nearshoreprovisions.html>, accessed 6/4/10.

- ¹⁶ Although the trawl fishery for whiting is managed under the Groundfish FMP, it is a distinct fishery in many respects, and is discussed separately.
- ¹⁷ See Leet et al. 2001 and Starr et al. 2002 for descriptions of these fisheries and gear types.
- ¹⁸ A second charter, *Golden Bear* Fishing Charters, also operates out of Crescent City; however, information was not available during fieldwork for this project.
- ¹⁹ The 1981 start date for this analysis is based on the availability the Pacific States Marine Fisheries Commission's (PSMFC) PacFIN database, which integrates Washington, Oregon and California commercial fishery landings data to provide a consistent coast-wide electronic record of landings from 1981 forward. The PacFIN data for California are based on the C-MASTER data provided by CDFG to the PSMFC.
- ²⁰ Throughout we abbreviate the names of these fisheries as follows: albacore for albacore troll, coonstripe shrimp for coonstripe shrimp pot, crab for crab pot, groundfish trawl for nonwhiting groundfish trawl, rockfish for rockfish/lingcod hook-and-line/pot, sablefish for sablefish hook-and-line/pot, salmon for salmon troll, and whiting for whiting trawl.
- ²¹ Because multiple species may be caught during a fishing trip, trips are measured by assigning each delivery to the fishery accounting for the greatest (i.e., plurality of) ex-vessel value associated with that delivery. In some cases, fishing for particular combinations of species and/or using multiple gear types on a single trip is prohibited.
- ²² Note that crab season straddles the calendar year (December through July), and most landings occur within the first one to two months of the season (Hankin et al. 2001). As a result, activity reported for a given year may not correspond to that of a season, *per se*. We analyzed the data by calendar year for consistency with analyses for other fisheries, most of which have seasons that lie within the calendar year.
- ²³ In 2005, to prevent a recurrence of this situation, the state of Oregon prohibited fishermen from delivering fish caught off the Oregon coast to buyers in California without an Oregon receiver's license.
- ²⁴ Because groundfish are taken as bycatch in the fishery, the shrimp trawl fishery is subject to federal groundfish regulations as well (Frimodig et al. 2009).
- ²⁵ Because the fishery did not begin until 1992, the averages reported are only for the 17-year period (1992-2007).
- ²⁶ The U.S. whiting fishery mostly occurs off Oregon and Washington and is conducted by fishermen in the shore-based, mothership, tribal, and catcher-processor sectors (Helser et al. 2008).
- ²⁷ This is an area for further economic research. Many fishery participants alluded to much higher operating costs; however, we were unable to collect detailed expenditure data to demonstrate this.
- ²⁸ Port-specific catch and effort estimates for the albacore and crab fisheries are not available.
- ²⁹ Initiated by the state in 2004, the CRFS provides comprehensive estimates of effort and catch for all recreational fishing modes and species. (Modes are the locations/facilities anglers fish from, and include: "manmade" structures, beaches and banks, CPFVs or charter boats, and private boats.)

- ³⁰ An ‘angler trip’ is defined as one angler spending part or all of one or more days fishing before returning to the location where the trip began. An ‘angler day’ is defined as one person’s fishing on a given day. For example, two anglers each fishing for three days counts as six angler days.
- ³¹ Pacific Choice Seafood, based in Portland Oregon, currently leases the former Eureka Fisheries facilities in Crescent City.
- ³² Differential prices among groundfish (including rockfish) species can mask changes in the make-up and profitability of the fishery.
- ³³ As part of the grant application process, in early 2009, the harbor collected information from commercial fishermen and support businesses to demonstrate that at least 144 jobs are dependent on the inner boat basin (Madar 2009a).

Trinidad Harbor Fishing Community Profile



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EXECUTIVE SUMMARY

Background

National Standard 8 of the Magnuson-Stevens Fishery Conservation and Management Act requires that fishery managers consider the importance of fishery resources to fishing communities, to provide for their sustained participation and to minimize adverse economic impacts on them, consistent with conservation objectives. Similarly, California's Marine Life Management Act mandates the use of socioeconomic as well as biophysical Essential Fishery Information to meet fishery management goals. Information on how individual fisheries and port communities operate is important to meeting these mandates. Yet, such social science information on Northern California port communities has been sparse until recently.

This profile of the Trinidad Harbor fishing community describes the history of the area and its fisheries, present-day fishery operations, activities and associated infrastructure. It identifies some of the key regulatory and economic factors highlighted by study participants that interact with and affect the local fishing community. It is intended for use in a range of processes, from local planning and education to state and regional management.

The information presented is based on the collection and integrated analysis of archival and field data to interpret patterns, variability and change within and across fisheries and the fishing community over time. Data sources include:

- Commercial fish landing receipt data for 1981–2007 reconfigured into 34 distinct species/gear combinations;
- Commercial Passenger Fishing Vessel (CPFV) logbook data for 1980–2007;

- An extensive review of the published and gray literature, including fishery status reports and historical fishery statistics (as available); and
- Field observation, interviews and group meetings with about 30 fishery participants and other knowledgeable individuals.

History of the Trinidad Harbor Fishing Community

Located 300 miles north of San Francisco and 25 miles north of Eureka, Trinidad is known for its spectacular scenery, unique cultural history, and abundant natural resources. Once home to the Yurok village of Tsurai, Trinidad became a hub for the gold mining, whaling and timber industries in the mid- to late-1800s. As those industries declined, residents turned increasingly to fishing as a source of livelihood.

Following the Hallmark family's construction of the Trinidad Pier in 1946 and a mooring basin soon after, Trinidad became an active fishing village, with smokehouses and a seasonal 'mosquito fleet' of up to 400 salmon trollers by the late 1970s. Charter fishing operations, first established in 1952, provided recreational fishing opportunities for visitors and residents alike.

Over the past 30 years, growing concerns about the status of West Coast salmon and groundfish stocks prompted the Pacific Fishery Management Council (PFMC) and the state to implement increasingly stringent management measures for commercial and recreational fisheries. Cumulatively, these measures have discouraged (nontribal) fishing along much of the North Coast, resulting in substantial reductions in both commercial and recreational fishing activity and contributing to social and economic impacts that have altered the fisheries landscape at Trinidad.

The Trinidad Harbor Fishing Community Today

Dungeness crab pot is the primary commercial fishery, with salmon and groundfish hook-and-line vessels contributing more modestly to local activity. With limited salmon fishing opportunities, charter and private boat fishermen focus primarily on groundfish; some also target halibut and crab. Many of Trinidad's approximately 300 residents and those who live in the surrounding area fish commercially, recreationally and/or for subsistence. In addition, many of the more than 12,000 people who visit Trinidad each year participate in a variety of marine-related activities, contributing substantially to the local economy.

The Trinidad Pier, owned and operated by the Cher-Ae Heights Indian Community of the Trinidad Rancheria since 2000, is the focal point of local fishing activity. In addition, it serves nonfishing visitors and accommodates Humboldt State University Marine Lab's saltwater intake pipe. The harbor is less developed than larger ports in the region due to its geography. Key fishery infrastructure includes the 540-foot pier, 100 seasonal and about 20 permanent moorings, a launch ramp, parking area and tackle shop. A restaurant at the base of the pier attracts visitors year round. There are no processing, ice-making or cold storage facilities onsite; most of the commercial catch is offloaded by Rancheria staff and distributed outside the community. The pier's fuel dock (which had fallen into disrepair) and fish cleaning station have been removed in recent years due to water quality issues, and the aging pier is slated for reconstruction.

The harbor hosts a fleet of about 17 resident commercial fishing operations and six charter operations, which together employ about 50 people. Most of these fishermen depend on

fishing as their primary, if not their sole, source of income. The harbor also hosts many resident and nonresident anglers, particularly during the summer months.

Commercial Fishing Activity Highlights

Relative to the *long term* (1981–2007), average annual fishing activity has increased in *recent years* (2003–2007) in terms of landings (+58%), ex-vessel value (+42%) and buyers (+36%), and decreased in terms of boats (-62%) and trips (-32%).

- The crab fishery, which accounted for an annual average of 80% of landings and 70% of ex-vessel value from 1947 through 1980, maintained its dominant position from 1981 through 2007, its average annual share of landings and value increasing to 93%.
- Salmon played a substantial role into the early 1980s. However, in recent years, salmon landings and ex-vessel value have accounted on average for less than 3% of total landings and value, with 12% of boats participating in the fishery.
- A small hook-and-line fishery for rockfish and lingcod accounted on average for about 1% of landings and ex-vessel value with 17% of commercial fishing vessels active from 1981 through 2007.

Landings and ex-vessel value peaked in 2006 at 1.9 million pounds worth \$3.1 million, with crab accounting for 99% of both landings and value.

The number of boats and trips peaked in 1982, when 221 boats made 4,651 deliveries, 63% of which were salmon. In 2007, 24 boats made a low of 925 deliveries, 90% of which were crab.

The average number of buyers is greater in recent years (peaking at 19 in 2007) relative to the long term. These buyers include several (and a growing number of) fishermen who handle their own catch.

Average annual ex-vessel prices in the crab pot and rockfish/lingcod hook-and-line fisheries are (respectively) 11% and 5% lower in recent years compared to the long term, whereas the annual average price of salmon is 14% higher.

Total average annual revenue per boat for ‘Trinidad boats’ (those with a plurality of their earnings from landings at Trinidad) increased nearly tenfold from \$10,000 to \$94,000 per vessel between the 1981–1983 and 2005–2007 periods. This change was driven largely by the sharp decline in lower-earning salmon trollers and the increased predominance of crab boats (for whom average annual revenue increased from \$40,000 to \$112,000 between the 1981–1983 and 2005–2007 periods). It is not clear, however, how these increases in revenue per boat compare to costs (which also have increased over time).

Recreational Fishing Activity Highlights

Given the stringent restrictions on salmon fishing since the mid-1990s, ocean anglers at Trinidad have increasingly targeted groundfish, especially rockfish, lingcod and halibut. Community members view groundfish as a second choice to, but not a substitute for, salmon. Some locals also participate in the winter crab fishery.

- Private boat activity has declined, as indicated by reduced use of seasonal moorings (from about 400 to 90) and reduced launch ramp use (from 45–60 launches per day to 10–30 in recent years).
- The average numbers of CPFVs boats, trips and angler days at Trinidad are, respectively, 68%, 95% and 84% greater in recent years compared to the long term.
- Trinidad is the most active CPFV port in the Redwood District (Humboldt and Del Norte counties), accounting for an average of 41%–46% of activity on all measures (boats, trips and angler days) in the long term and increasing to 75%–81%, in recent years.

Key Factors Affecting Trinidad Harbor Fisheries

Salmon fishery management: The implementation of stringent regulations on (and at times, complete closure of) the commercial salmon fishery by the PFMC, as well as the state’s limited entry program initiated in the early 1980s, led to a sharp decline in the commercial salmon troll fleet, which had become the centerpiece of the Trinidad community in the summer. The core commercial fleet that remained increased its focus on the winter crab fishery; some also entered or increased their activity in the recreational charter fishery. Reduced harvest allocations to nontribal fisheries in the early 1990s led to further reductions in fishing opportunities, and sharply curtailed the seasonal influx of summer fishermen and the associated economic activity on which many local businesses such as smokehouses, tackle shops, grocers and RV parks depended.

Groundfish fishery management: Increasingly strict federal catch limits since the 1990s, together with the 2003 implementation of restricted access in the state’s nearshore fishery, have limited commercial fishery participation and made it cost-prohibitive for most buyers to purchase and transport the relatively small amounts of fish landed at Trinidad. Recent time and area closures to protect yelloweye rockfish, coupled with the 2008 salmon closure and the limited (10-day) 2009 season, eliminated many local recreational fishing opportunities, further straining local support businesses and negatively affecting the community’s sense of well-being.

Water quality management: In 1974, the state designated the Trinidad Kelp Beds an Area of Special Biological Significance (ASBS); in 2002, it was classified as a state Critical Coastal Area (CCA). Since acquiring

the pier and associated infrastructure in 2000, the Rancheria has taken several actions to meet the site's particularly high water quality standards while addressing the needs of the fishing community, which depends on safe, functional infrastructure.

Increasing costs: For fishery support businesses dependent upon recreational visitors, high fuel costs, coupled with the broader economic downturn as well as fishery closures, have contributed to reduced demand for their goods and services. Commercial fishery participants also cited increases in fuel, dockage and offloading fees, an estimated 35%–40% increase in the cost of crab pot materials, and the assessment levied on crab catches to help repay the federal West Coast groundfish trawl buyback loan.

Variable and uncertain revenues: Despite the increase in average revenue per boat in recent years, commercial fishery participants remain subject to natural variability in crab stocks and regulatory constraints on rockfish and salmon fishing. Variable and uncertain revenues from fishery-related activities affect the Rancheria's ability to maintain and repair the pier and associated facilities.

Current Situation and Outlook

The Trinidad Harbor fishing community continues to adjust to changes in fishing opportunities, as well as requirements stemming from the area's designation as an ASBS/CCA. The commercial sector's primary dependence on a single fishery (crab) and the recreational sector's limited fishing opportunities make them potentially vulnerable to changing resource, regulatory and market conditions. In addition, the North Coast Marine Life Protection Act process, begun in late 2009, is likely to lead to additional closures of nearby state waters. The Rancheria is actively pursuing funding to replace the pier; however, securing full funding for the \$8-million project has been difficult, given these factors and the current economic climate.

Nonetheless, the Trinidad Harbor fishing community is well positioned to address these challenges. As a natural harbor with modest infrastructure (pier, launch ramp and moorings only), there are no navigation channels or slips to be maintained. The Rancheria has more operational flexibility than most publicly managed facilities, and has successfully collaborated with the City of Trinidad and others to obtain partial funding for the much-needed reconstruction of the pier. The fishing community is a small but substantially integrated group, and most individuals recognize that their respective needs are interdependent. These features lend the Trinidad Harbor fishing community a degree of resilience that may enable it to effectively address the challenges and opportunities that lie ahead.

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Cover photo by J. Popenoe, <http://pages.suddenlink.net/popenoe/scenes/Trinidad.htm>.

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INTRODUCTION

Trinidad Harbor has supported commercial and recreational fisheries for well over a century. Located 300 miles north of San Francisco and 25 miles north of Eureka (Figure 1), Trinidad is known for its spectacular scenery, unique cultural history, and abundant natural resources. Recognizing the area’s natural assets, the State designated the Trinidad Kelp Beds as an Area of Special Biological Significance (ASBS) in 1974 (State Water Resources Control Board (SWRCB) 1974); in 2002, it was classified as a state Critical Coastal Area (CCA).¹ Most fishery-related activity centers around Trinidad Pier, built by the Hallmark family in the 1940s and operated by them until 2000, when the Cher-ae Heights Indian Community of the Trinidad Rancheria purchased it. Since then, the Rancheria has managed operations at the pier, and is leading a planning process that includes elements to meet stringent ASBS/CCA water quality standards and improve facilities to meet the needs of the fishing community, other community members, and visitors.

Trinidad is notable for its particularly rugged and undeveloped coastline and ready access to marine resources that have supported fisheries

for Dungeness crab (*Cancer magister*), groundfish (various roundfishes, flatfishes and rockfishes (*Sebastes* spp.)) and historically, coho (*Oncorhynchus kisutch*) and Chinook (*O. tshawytscha*) salmon. These and other coastal and marine resources – and the area itself – were central to the physical and cultural well-being of the residents of the Yurok village of Tsurai (as they are to Trinidad Rancheria members today; (Trinidad Rancheria 2009). Trinidad became a hub for the gold mining, whaling and timber industries in the late 1800s. As those industries declined, commercial fisheries for crab and salmon grew, with smokehouses and a seasonal ‘mosquito fleet’ of up to 400 salmon trollers by the late 1970s.

Both residents and visitors to Trinidad have participated in recreational and/or subsistence ocean fishing for decades, especially since the opening of the boat basin and launch facilities in the late 1940s. Marine-related activities are a substantial part of Trinidad’s economic base. With a resident population of about 300, Trinidad attracts more than 12,000 visitors annually who enjoy the area’s state parks,



Figure 1. Map of Trinidad Harbor, California

fishing opportunities and other amenities (Sloan and Rocha 2007). In addition, the Humboldt State University Marine Laboratory is located near the harbor, and depends on the pier infrastructure to accommodate its seawater intake systems.

NOAA's National Weather Service has noted that the area from Eureka north, including Trinidad, is uniquely positioned to experience some of the worst and most dangerous winter storms and summer fog associated with coastal upwelling. These conditions frequently and substantially limit access to fishing grounds. Although protected from northerly storms by Trinidad Head, the pier and mooring basin are exposed to southerly storms, which can wreak havoc on fishing operations. In 1959, an intense winter storm damaged the pier such that it had to be shortened by 20 feet. More recently, in the winter of 2007–2008, another storm led to the loss of the boat of a seasoned local fisherman. While some might consider the exposure too risky, most fishermen who operate in the area have come to know and accept the conditions, and are willing to persevere in order to access the rich nearby fishing grounds.

This profile of the Trinidad Harbor fishing community provides a history of the area, focusing on the development of ocean fisheries and related infrastructure, with particular emphasis on the period since 1981 (for which detailed electronic landings data are available).² It describes present-day fishery operations, activities and associated infrastructure; and discusses some of the key regulatory and economic factors highlighted by study participants that interact with and affect the local fishing community.

The information presented here is based on archival and field research conducted between July 2007 and March 2009.³ Fieldwork included observation, informal and formal

interviews and group meetings. These activities engaged approximately 30 people, including 12 local commercial and recreational fishermen, three fish buyers, owners and employees of three fishery-support businesses, the harbor manager and other Rancheria and City staff, as well as other community members who have experience and knowledge of local fisheries. Field data were analyzed together with existing commercial and recreational data and information from other primary and secondary sources to interpret patterns, variability and change within and across fisheries and the fishing community over time.

History of the Port and the Surrounding Area

Prior to European settlement, the area now known as Trinidad was part of the Yurok Territory.⁴ One of the largest coastal Yurok villages, Tsurai (meaning ‘mountain’), was located in the protected cove south of Trinidad Head. According to a recent Trinidad Rancheria report:

Traditionally our people subsisted on the abundant plants of the redwood forests (e.g., acorns, mushrooms, and wild herbs and teas), large game animals (e.g., deer and elk) and — as the most readily available and healthful sources of protein — salmon, rockfish (e.g., cod and snapper) ‘surf’ fish (smelt), shell fish (e.g., clams, crab, and mussels), and seaweed, all caught or gathered along the ancestral coastline (Trinidad Rancheria 2009).

In 1775, Spanish explorers sailed into the bay and claimed the land for Spain, naming it Trinidad (after the doctrine of the Holy Trinity). Subsequent explorers and fur traders visited the area, but it was not until the gold rush of 1850 that settlers came to stay.

Once gold was found in the Klamath, Trinity and Salmon Rivers, Trinidad was established and grew rapidly, reaching a population of 3,000 by 1851 (Murray 1950). The first official town in Humboldt County, Trinidad was the county seat from 1852 to 1854, and connected people and supplies to gold mining operations inland. Over the next several decades, fishing (mainly

for salmon), whaling and logging operations were active in and around Trinidad. The first timber mill was built at Mill Creek, just north of Trinidad, in 1853. A handful of other mills followed but, by the early 1880s, most closed as interest focused on the highly productive timber trade at Eureka (Sloan and Rocha 2007).

Trinidad Harbor Fishing Community Timeline

1800	Tsurai Community's first contact with European-Americans
1850	Gold discovered Trinidad established
1871	Trinidad Head Lighthouse built
1908	Trinidad Rancheria established
1920s	Whaling stations active Katy's Smokehouse begins processing salmon, crab
1945-46	Hallmark family builds pier
1948	Mooring basin opens
1950s	Skiff rentals encourage recreational fishery Charter fishing begins Smokehouses process salmon, crab
1959	Major winter storm damages pier and boats
1961	Highway 101 built past Trinidad
1970s	"Mosquito fleet" of 400 salmon trollers
1974	Boldt Decision Trinidad Area of Special Biological Significance (ASBS) established
1976	Magnuson-Stevens Fishery Conservation and Management Act (MSA)
1979	Klamath Management Zone (KMZ) established
1982	Salmon limited entry
1985	KMZ commercial salmon fishery closure
1992	KMZ recreational salmon fishery limited to 14 days Dungeness crab fishery moratorium on entry
1993	Salmon re-allocation to tribes (50%) Coho retention prohibited in commercial fishery
1994	Groundfish limited entry Salmon disaster Coho retention prohibited in KMZ recreational fishery
1995	Dungeness crab limited entry
1996	Sustainable Fisheries Act (MSA re-authorized)
1997	Fuel dock closes
1998	Marine Life and Nearshore Fishery Management Acts
1999	Marine Life Protection Act (MLPA)
2000	Trinidad Rancheria purchases pier West Coast groundfish disaster
2002	Nearshore Fisheries Management Plan (FMP) adopted First federal Rockfish Conservation Area (RCA) established Trinidad ASBS classified as a Critical Coastal Area
2003	Nearshore fishery restricted access
2006	MSA re-authorized Klamath salmon disaster Fish cleaning station removed from pier
2008	Statewide salmon disaster and fishery closure In-season recreational rockfish closure
2009	Statewide salmon disaster and fishery closure North coast MLPA process begins

During this time of intense settlement in the north coast region, many native peoples were forced off their land. The U.S. government negotiated with the Yurok, Karuk and Hupa tribes to establish Indian lands and reservations and quell the violence between settlers and Indians. According to Sloan and Rocha (2007), “Tsurai people were invited to attend the treaty meeting at Eel River with the possibility of moving to that proposed reservation, but declined, stating that they preferred to remain in their oceanside village.” However, as the City of Trinidad became more established, the Tsurai people were gradually displaced from their ancestral territory, with the last member of the village forced to move around 1916.⁵ Displaced Indians who did not go to the Hoopa Valley Indian Reservation (established in 1864) were later granted land rights through a 1914 Congressional act [38 Stat. 589 Chap. 222 Sec. 3, 1914]. The 60-acre Trinidad Rancheria, established in 1908, became home to the Cher-Ae Heights Indian Community, a federally recognized tribe with ancestral ties to the Yurok, Wiyot, Tolowa, Chetco, Karuk and Hupa peoples (Trinidad Rancheria 2009, City of Trinidad 2007).

History of Trinidad Pier Fisheries

Nontribal river fisheries for coho and Chinook salmon were active locally from the mid-1800s. The ocean salmon fishery, begun in Monterey Bay in the late 1880s, reached the North Coast by 1920 and, by the late 1920s, salmon fishermen were active in Trinidad (Feinberg and Morgan 1980). Trinidad Pier, built by the Hallmark family to support timber production and commercial fisheries, opened in 1946; the mooring basin opened in 1948. Infrastructure and services at the pier included a restaurant, a fuel dock and a bait and tackle shop located under the pier, a water taxi for transport to and from moorings, and a fish cleaning station. At least three smokehouses operated locally, processing commercially and recreationally caught salmon.

Long-term landings data suggest that the commercial fishery for Dungeness crab was active at least since the 1940s (Figure 2). For example, the year after the pier was built (1947), crab accounted for 60% of commercial fishery landings and 74% of the ex-vessel value at Trinidad. Fish companies such as Tom Lazio Fish Company, Hallmark Fisheries, and Eureka Fisheries received Dungeness crab, salmon, and other species. Katy’s Smokehouse, a local receiving and processing operation run by Katy State, received fish for out-of-area buyers, processed crab, and smoked salmon (for recreational and commercial fishermen). At least two other local smokehouses also processed salmon.

Marked growth in Trinidad’s recreational fisheries began in the early 1950s, following the opening of the boat basin adjacent to the pier to serve recreational as well as commercial fishermen. To provide more ocean fishing opportunities for anglers, the Hallmarks began renting skiffs. Trinidad’s first two charter operations started in 1952, targeting salmon and to a lesser extent rockfish. Locals, too, fished frequently during the summer for salmon, in the winter for crab, and year-round for rockfish, launching from the beach or the pier’s launch ramp. For Rancheria members, subsistence activities included fishing for or collecting “salmon, clams and abalone (as both food sources and for the shells, which are used in ceremonial regalia), mussels, seaweed, eels, crab, surf fish, candle fish and sea salt... all along the coast line from the Luffenholtz Beach area to the Trinidad Harbor and beyond” (Trinidad Rancheria 2009).

The area became more accessible with the opening of U.S. Highway 101 in the early 1960s. Salmon availability and easy access attracted retirees, teachers and others who would trailer their boats to Trinidad and stay for weeks or the entire summer to fish. Many anglers bought commercial licenses so they

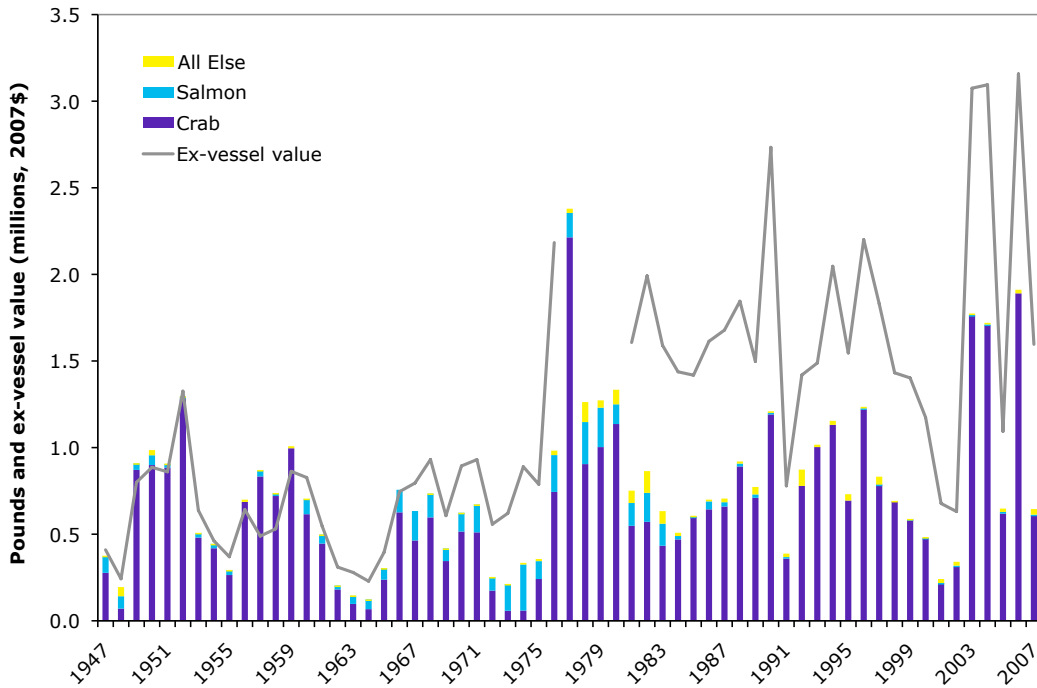


Figure 2. Pounds and ex-vessel value of commercial fishery landings at Trinidad, 1947–2007 (CDFG Fish Bulletin Series) Note: Ex-vessel value data for 1977–1980 are not available.

could catch more fish and offset expenses. This ‘mosquito fleet’ grew to as many as 400 vessels that used seasonal moorings, and more that launched from the ramp or the beach. Fishing activity generated revenues for Trinidad and its growing number of support businesses including the pier, smokehouses, RV parks, the local grocery store, restaurants and others.

In 1978, the Pacific Fishery Management Council (PFMC)⁶ implemented a Salmon Fishery Management Plan (FMP). In 1979, to better address concerns regarding fishery impacts on Klamath River fall Chinook, the PFMC established the Klamath Management Zone (KMZ; Pierce 1998), which extends from Humbug Mountain near Port Orford, Oregon to Horse Mountain, California, and encompasses Trinidad fishermen’s primary fishing grounds. In 1982, California adopted a statewide limited entry program for commercial trollers. By 1984, the PFMC had shortened the commercial salmon season in the KMZ to approximately

two months – much shorter than the 5-6 month seasons in other areas south of Cape Falcon, Oregon. This action reflected the PFMC policy of imposing greater restrictions in areas with greater impacts on Klamath fall Chinook (the KMZ) in lieu of lesser restrictions over a larger geographic area. As a result, commercial salmon seasons in the California KMZ have at times been only days or weeks in duration, and in some years completely closed as first occurred in 1985.⁷

Beginning in 1992, the PFMC prohibited retention of coho in the commercial salmon fishery south of Cape Falcon, Oregon due to conservation concerns regarding Oregon Coastal Natural coho (PFMC 1992; Trinidad Harbor Fishing Community Timeline). This led to fishery disaster declarations for California and Oregon fishing communities in 1994 and 1995. Although the KMZ commercial fishery was not as dependent on coho as fisheries further north, the California

KMZ was completely closed from 1992 through 1995, largely due to more localized factors that compounded the effects of the coho nonretention policy. In 1993, Klamath fall Chinook was declared overfished (PFMC 1994), and the Department of Interior Solicitor issued an opinion allocating 50% of Klamath-Trinity River salmon to the Yurok and Hoopa tribes. This was significantly higher than the 30% tribal allocation brokered by the Klamath Fishery Management Council in a previous 1987–1991 agreement, and required reduced allocations to nontribal fisheries, including the KMZ commercial fishery (Pierce 1998).⁸ The cumulative effect of these management actions was to discourage (nontribal) salmon fishing along much of the North Coast, resulting in substantial reductions in both commercial and recreational fishing activity at Trinidad, as elsewhere.

In 2006, the failure of Klamath fall Chinook to meet its escapement floor for the third consecutive year prompted closure of the commercial salmon fishery in California's KMZ. Then, in 2008 and 2009, the commercial fishery was closed statewide due to low escapements of Sacramento River fall Chinook. All three closures were accompanied by disaster relief for affected fishing communities. The 2008–2009 closures were unprecedented for many salmon-dependent fishing communities, and exacerbated conditions in North Coast communities following more than two decades of severe restrictions on the KMZ salmon fishery.

Fishing opportunities also have been curtailed by state and federal management in the West Coast groundfish fishery. In 1982, the PFMC implemented its Groundfish FMP and managed the commercial fishery with measures such as harvest guidelines, trip landing and trip frequency limits, size limits, and gear restrictions. In 1992, the PFMC adopted a harvest rate policy for groundfish

based on the assumption that West Coast groundfish were similar in productivity to other well-studied groundfish stocks. In 1994, the PFMC implemented a limited entry program resulting in differential regulations (including differential trip limits) for limited entry and open access vessels. Groundfish vessels in Trinidad fell into the open access category and have been affected by open access regulations since. To afford fishery participants with more flexibility and better enable them to reduce discards, trip landing limits were subsequently replaced with vessel cumulative landing limits that gradually increased in duration (weekly, biweekly, monthly, bimonthly).

In subsequent years, as growing scientific evidence indicated that rockfish (*Sebastes* spp.) had productivity rates much lower than other groundfish species, the PFMC adopted increasingly restrictive management measures for rockfishes.⁹ However, these measures came too late to reverse the effects of longstanding harvest policies based on inaccurate assumptions, and between 1999 and 2002, eight groundfish stocks were declared overfished.¹⁰ In 2000, a federal disaster was declared in the West Coast groundfish fishery.

In order to rebuild overfished stocks, optimum yields (OYs) and trip landing limits for healthy stocks typically taken with overfished species were reduced further for both limited entry and open access vessels. The PFMC also implemented Rockfish Conservation Areas (RCAs) to reduce the catch of overfished species (PFMC 2008). The first federal RCA, implemented in September 2002, closed continental shelf and slope waters to commercial groundfish fishing from near Cape Mendocino north to the Canadian border. Additional broader restrictions followed in subsequent years, some of which affected groundfish vessels at Trinidad. These included depth-based closures and (in 2008) the extension of the limited entry vessel

monitoring system requirement to nontrawl open access vessels.

State management of the groundfish fishery also expanded during this time. The passage of the Nearshore Fishery Management Act (within the state's Marine Life Management Act) in 1998 established minimum size limits for 10 commonly caught nearshore species, and mandated the development of a Nearshore FMP. In 2001, the nearshore rockfish fishery was closed outside 20 fathoms from March through June. Two years later, the state implemented its Nearshore FMP, which specified management measures for 19 nearshore species, including gear and seasonal restrictions as well as a restricted access program as means to achieve the statewide capacity goal of 61 participants (down from 1,128 in 1999). Of the 216 transferable permits issued, 29 were allocated to the North Coast (Cape Mendocino north to the Oregon border); two of these permits are held by Trinidad area fishermen.

The Dungeness crab fishery, long an important fishery for Trinidad-based operations, has not experienced the types of drastic management changes as occurred in the salmon and groundfish fisheries. In managing the fishery, the state uses a "three S" (sex, size, season) strategy that includes male-only harvest (since 1897), a minimum size limit (since 1911) and a limited season (since 1957). In 1992, a moratorium on entry was established; restricted access was implemented in 1995. The northern crab season usually runs from December 1 through July 15, but its start has been delayed in some years because of price disputes. In addition, the opening may be delayed to insure that male crabs have completed molting, as occurred in 2005. In 2009, the state convened a Dungeness Crab Task Force in response to concerns about recent increases in participation and gear use. Following the recommendation of the Task Force (California Dungeness Crab

Task Force 2010), a bill that would establish a pilot crab pot allocation program to address those concerns (SB 1039, Wiggins) is pending in the State Legislature.

Recreational fisheries at Trinidad, which primarily targeted salmon, have similarly been affected by KMZ restrictions related to management of Klamath River fall Chinook and tribal allocation changes. However, due to its lesser impact on Klamath fall Chinook, the KMZ recreational fishery has generally been less constrained than the commercial fishery (though more constrained than the recreational salmon fishery elsewhere in the state). In 1986, the season in the California KMZ was reduced from about nine months to five months. Since then, seasons in the California KMZ have generally ranged from one to six months, with several notable exceptions (i.e., the 14-, 0-, and 10-day openings in 1992, 2008, and 2009 respectively). This is in contrast to other parts of the state, where the recreational season generally extends for six to nine months (PFMC 2009). While the KMZ recreational fishery is much reduced from the peak periods of the 1970s and 1980s, it remains an active fishery that attracts both resident and nonresident anglers, at least in those years when recreational fishing opportunity is available.

The recreational groundfish fishery has been increasingly constrained since the late 1990s to address concerns regarding depleted or overfished stocks, particularly rockfishes. As a result, the California Department of Fish and Game (CDFG) has been required to make trade-offs between closing areas (i.e., spatial management) and shortening the season. Measures have included bag limit reductions first implemented in 1998, inseason closures since 2000, and depth-based closures starting in 2004. In 2008, CDFG closed the fishery four months early (on September 2) due to a very low OY for overfished yelloweye rockfish (*Sebastes ruberrimus*).

In addition to the changing fisheries landscape, circumstances at the pier have changed as well. In the early 1990s, the fuel dock fell into disrepair and was subsequently closed. In 2000, the Trinidad Rancheria purchased the pier and associated property from the Hallmark family. Soon afterward, the Rancheria began work to address deferred maintenance, and removed the fuel dock and fuel storage tanks, which had been leaking. With increasingly strict water quality standards related to the area's status as an ASBS/CCA, the fish cleaning station was removed in early 2008. Water quality and safety concerns related to the 60-year old pier have led the Rancheria to pursue coordinated harbor planning with the Trinidad community and seek funding to replace the pier and its facilities (Trinidad Rancheria 2009).



THE TRINIDAD FISHING COMMUNITY TODAY

The Trinidad fishing community consists of both commercial and recreational fishery participants and their families, as well as fishery-support businesses located at the pier and in town (Table 1). Because Trinidad is a small community, local fishermen also rely on businesses elsewhere in the region for additional services, gear and supplies (Table 2). Local commercial fisheries are primarily focused on crab, but also include some nearshore groundfish and salmon. Recreational fisheries include private boat operations as well as six charter operations that cater mainly to nonresidents, primarily offering groundfish and crab trips and, when available, salmon trips.



Table 1. Local infrastructure and support businesses used by Trinidad fishery participants.

Business Type	Business Name
Fish receivers/buyers	Trinidad Rancheria Hallmark Fisheries Nor Cal Seafoods
Processors	Katy's Smokehouse
Marine Supply	Ace Hardware Salty's Surf N Tackle Seascape Tackle Shop
Vessel Repair/Maintenance	None
Marine Refrigeration	None
Cold Storage	None
Ice Facility	None
Fuel Dock	None
Commercial Diver	Private Individual
Retail Fish Market	Murphy's Market Katy's Smokehouse
Charter Operations	Betty Ellen Charters, F/V <i>Betty Ellen</i> Northwind Charters, F/V <i>Pioneer</i> Patrick's Point Charters, F/V <i>Toni Rae II</i> Shenandoah Fishing Charters, F/V <i>Shenandoah</i> Trinidad Bay Charters, F/V <i>Jumpin' Jack</i> Wind Rose Charters, F/V <i>Wind Rose</i>
Port Management	Trinidad Rancheria
Restaurants	Seascape Restaurant
Motels and RV Parks	Emerald Forest of Trinidad Ocean Grove Lodge Sylvan Harbor Trinidad Bay Trailer Court

Table 2. Out-of-area businesses used by Trinidad Harbor fishery participants.

Business	Type	Location
Cloudburst Fishing Company	Boatbuilding and repair	Eureka
Costco	Miscellaneous supplies	Eureka
Custom Crab Pots	Crab pot materials	Eureka
Drilling Machine Shop	Machine shop	Eureka
Englund Marine	Marine supply	Eureka
Eureka Ice & Cold Storage*	Cold storage	Eureka
Eureka Oxygen	Welding services/ supplies	Eureka
Fabcast, Inc.	Electronics/hydraulics	Eureka
Fred's Marine Electronics	Electronics	Eureka
Hallmark Fisheries	Buyer	Charleston, OR
Humboldt Bay Harbor, Recreation and Conservation District	Haul-out, refuge during storms, seasonal mooring	Eureka, Fields Landing
Mad River Outfitters	Marine supply	Arcata
NOAA Weather Service	Weather information	Eureka
Nor Cal Fisheries	Buyer	Oakland, CA
Outboard Center**	Outboard mechanic/parts	Arcata
Pro Sport Center	Diving service	Eureka
Quality Crab Pots	Crab pot materials	Rio Del
Renner Petroleum	Fuel	McKinleyville
Southbend Packers	Buyer	South Bend, WA
Trinity Supply	Diesel mechanic	Eureka
Various	Bait	Los Angeles, Eureka; Reedsport, OR; Ilwaco, Westport, WA

* Eureka Ice & Cold Storage ceased operations in 2008.

** The Outboard Center closed in 2009.

Commercial Fisheries

The primary commercial fisheries at Trinidad include the pot fishery for Dungeness crab, hook-and-line fisheries for various groundfish species, and (historically) the troll fishery for Chinook salmon.¹¹ (All other fisheries have accounted for less than 1% of landings and value over time, and cannot be reported in most years because of the small number of participants.) These fisheries are seasonal as a function of resource availability, regulations that define when, where and how each fishery may operate, the availability of buyers, and market demand (Table 3). However, it should be noted that the actual temporal distribution

of activity is often more compressed, variable and complex. For instance, the crab fishery is concentrated in the winter months due to high abundance at the start of the season (December) as well as holiday demand. Groundfish seasons are defined in two-month increments (reflecting the use of bimonthly vessel cumulative landing limits), vary by species, and are sometimes subject to inseason closures to prevent OYs of selected species from being exceeded. Since 2000, the salmon season in the California KMZ (including Trinidad) has ranged between 0 and 30 days in recent years, with complete closures in 2006, 2008 and 2009.

Table 3. Seasonality of selected commercial fisheries at Trinidad Pier.

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC
Crab												
Groundfish												
Salmon												

Approximately 17 commercial fishing operations, each employing a skipper and two crew (in most cases), are based at Trinidad Harbor.¹² All participate in the crab fishery, as many as six participate in the salmon and rockfish/lingcod hook-and-line fisheries, and four operate charter businesses during the summer months. Because vessels are moored and not secured in a harbor slip, they do not exceed 36 feet in length. Fishermen have found that this size is effective for fishing, yet light enough to stay on a mooring during rough weather. When severe weather is forecast – especially from southerly fronts – some skippers run their vessels 20 miles south to Humboldt Bay for protection.

Most of Trinidad’s commercial fishermen depend on fishing as their primary, if not their sole, source of income. Some fish year-round as resource availability, weather and regulations permit, while others fish commercially in the winter and run charter operations during the summer or do other work as part of their livelihood. Historically, many salmon fishery participants were part-time fishermen who fished during the summer salmon season, and worked in other jobs locally or elsewhere the rest of the year. However, this changed with the establishment of the KMZ and the significantly shortened salmon seasons in subsequent years. Only those willing and able to travel to other areas with more substantial seasons remain active in the salmon fishery. Today, few transient vessels use Trinidad Harbor, although some occasionally anchor there while traveling along the coast.

Trinidad Pier Seafood Receiving, Processing and Marketing

Trinidad Pier staff employed by the Rancheria offload the commercial catch on behalf of fish buyers, most of whom are based outside Trinidad. Currently, no processing occurs at the pier; the catch is either trucked to buyers’ facilities elsewhere or delivered directly to markets. Due in part to the port’s isolation and the small number of buyers, many fishermen handle their own (and perhaps others’) catch, taking it to buyers, retailers or restaurants in the region (Figure 3). Generally speaking, there are no ‘off-the-boat’ sales to the public.

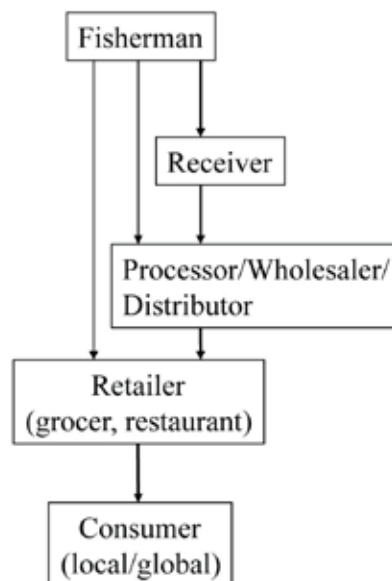


Figure 3. Pathways of seafood landed at Trinidad. Note: Thicker arrows indicate most common pathways.

Dungeness crab represents the majority of catch landed at Trinidad. Early in the season, much of the catch is distributed outside the North Coast region in the cooked and frozen markets. One notable exception is Cap'n Zach's Crab Shack, which wholesales and retails locally caught crab in nearby McKinleyville. Later in the season, more of the product is directed toward the local and San Francisco Bay area live markets. Traditionally, the groundfish fishery produced whole fish and filets for restaurants, fish markets and groceries within the region. Since the 1990s, some of the catch has been directed toward the San Francisco Bay area live market for rockfish and other groundfish species. Katy's Smokehouse, located less than a mile from the pier, provides fish smoking services (for commercial and recreational fishermen), and retails a variety of local and nonlocal seafood products. In addition, local grocery stores such as Murphy's Market sell some of the crab, rockfish and salmon landed by Trinidad fishermen to local consumers.

Recreational Fishing

The proximity of rich fishing grounds and spectacular scenery make Trinidad Bay appealing to resident and nonresident anglers alike. However, extreme weather is common along this part of the North Coast, often limiting the number of days that can be safely fished. Trinidad's ocean recreational fisheries currently include many private boat operations

and six charter operations that participate in the rockfish and lingcod (*Ophiodon elongates*) and halibut (California halibut, *Paralichthys californicus* and Pacific halibut, *Hippoglossus stenolepis*) hook-and-line, salmon (when available) and albacore (*Thunnus alalunga*) troll, and Dungeness crab pot fisheries.

As with commercial fisheries, the seasonality of recreational fisheries is defined by resource availability, weather and regulations. The seasonality of recreational fishing activity at Trinidad Harbor described in Table 4 is a simplification of actual activity, which is often more compressed and variable. For instance, the availability of albacore to recreational anglers varies widely from year to year due to variable oceanographic conditions. The groundfish fishery, which was open year-round through the early 2000s, has not opened until May in recent years, and has been subject to late-season closure to prevent OYs of selected species from being exceeded. The salmon season in the California KMZ (including Trinidad) is only open for a subset of days in some months to extend the length of the season; the fishery was completely closed in 2008 and open for only 10 days in 2009.

Charter Fishing Operations

Some of Trinidad's current charter operations ('CPFVs') have operated since at least the 1970s, run by subsequent generations of the same families. As of late 2008, six CPFVs

Table 4. Seasonality of major recreational fisheries at Trinidad Harbor.

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC
Albacore												
Crab												
Groundfish												
Salmon												



operated out of Trinidad. Five of these are ‘six-packs’, smaller vessels (25- to 38-foot) that carry a maximum of six fishing passengers; one (a 44-foot boat) carries up to 12 passengers. Four of these operations also participate in the winter commercial crab fishery. In addition, most also offer scenic viewing (including whale-watching) trips.

Private Boat Operations

Although recreational activity is not as extensive as in previous decades, a substantial core group of residents and many visitors continue to fish out of Trinidad. Many of these individuals, tribal and nontribal alike, depend on fishing (in many cases along with other food-collecting activities) for subsistence as well as recreational, social and cultural benefits. Use of the harbor’s 90 moorings is variable. According to the harbor manager (in summer 2009),

“we’ve averaged 30 to 40 boats a day (launching) on the weekend, 10 to 30 during the week. It was definitely more historically, especially when we had a full salmon season. On weekends, we had 45 to 60 boats – basically twice as much (as this year).”

Harbor Infrastructure and Fishery-Support Businesses

Trinidad Harbor’s exposure to southerly storms precludes the development of more substantial harbor infrastructure and in turn limits local fishery development. According

to a 1981 feasibility study, the Army Corps of Engineers determined that harbor development would require building a breakwater to protect boats and facilities from southerly storms, but that such a structure would also cause shoaling and require frequent dredging, the costs of which would exceed the benefits (Oscar Larson & Associates 1981). As a result, Trinidad Harbor has remained a relatively undeveloped ‘natural harbor’ with moorings but no berthing. Nonetheless, it provides the only semi-protected mooring facility on the coast between Eureka and Crescent City. Trinidad’s commercial and recreational fishery participants utilize equipment, goods and services provided by the Rancheria, which owns and operates the six-acre harbor site. This includes the pier and mooring basin; boat launching, cleaning and maintenance facilities; a receiving station with hoists; a bait-and-tackle shop; the Seascape Restaurant; and parking and storage areas (Table 5). About 100 moorings are available seasonally for recreational boats; there are no slips. Commercial fishermen own and maintain their own moorings. Boats up to 26 feet in length can use the Rancheria’s launch ramp; smaller boats may be launched from the adjacent beach. Due to water quality regulations related to the area’s status as an ASBS/CCA, the pier’s fuel dock and fish cleaning station were removed recently, and there is no pump-out station.

A few businesses located elsewhere in Trinidad provide goods and services to recreational and commercial fishery participants. For recreational fishermen, these include Salty’s Surf N Tackle shop, Murphy’s Market, and several RV parks and campgrounds in and just north of Trinidad. Katy’s Smokehouse sells bait for fishing, processes commercially and recreationally caught fish, sells smoked (commercially caught) seafood to consumers, and is involved in fish receiving at the pier.

Table 5. Trinidad Pier user groups, infrastructure and services (as of July 2008).

User groups	Rancheria-owned infrastructure	Services
Commercial fishermen	Launch ramp (1)	Boat launching
Recreational fishermen Charter Private boat	Moorings (~100 seasonal) Offloading Infrastructure Hoists (4)	Boat washing Fish receiving
Community residents	Receiving station (1)	Water taxi
Tourists	Other Infrastructure Restaurant Bait and tackle shop Skiff storage racks Parking	

Given the limited infrastructure and variety of support businesses locally, Trinidad’s commercial and recreational fishermen also utilize businesses elsewhere in the region and along the West Coast to obtain needed goods and services. For example, many purchase fishing gear and equipment, and obtain electrical, mechanical and hydraulic services in nearby Eureka. Some haul out at the Humboldt Bay Harbor, Recreation and Conservation District’s boatyard in Fields Landing. In addition, when especially rough weather is forecast, fishermen move their boats to more-protected Humboldt Bay. Three small boat repair/maintenance businesses in nearby McKinleyville and Eureka primarily service sport boats.

Fishing Organizations and Events

One commercial fishing association, the Trinidad Bay Fishermen’s Marketing Association, is active locally. At one time, Trinidad also had a Commercial Fishermen’s Wives Association. More recently, women

associated with Trinidad’s commercial fisheries have been active in county-wide Humboldt Women for Commercial Fisheries, which has developed a “Humboldt Wild Seafood” campaign to promote local seafood sales. Among the state’s recreational fishing organizations, the Humboldt Tuna Club, the Humboldt Area Saltwater Anglers and the Recreational Fishing Alliance are active along the North Coast; however, none is active at Trinidad.

Two annual events celebrate Trinidad’s fishing heritage. The Trinidad Fish Festival, held in June, is a community event that historically featured local crab and salmon and increasingly attracts visitors. With the decline in local salmon fishing, however, the festival has had to rely on salmon imported from other states. In November, the fishing community and the Rancheria together participate in the Blessing of the Fleet in anticipation of the opening of the winter crab season.

COMMERCIAL FISHERY ACTIVITY AT TRINIDAD

This section focuses on commercial fishing activity at Trinidad between 1981 and 2007.¹³ The information provided here is based on customized summaries of Pacific Fisheries Information Network (PacFIN) landings receipt data, augmented by sources that provide earlier and/or longer-term data, and data from fieldwork conducted between late 2007 and early 2009. In the discussion that follows, we compare the *long term* (1981–2007) to *recent years* (2003–2007) to demonstrate how recent activity compares with longer-term activity. Although this section addresses activity beginning in 1981, it should be noted that some local fisheries (i.e., crab, groundfish and salmon) have a much longer history in Trinidad; however comparable data are not readily available for the pre-1981 period (see Figure 2).

We use five measures of fishing activity derived from the landings receipt data. Landings are reported as ‘round weight’ (in pounds), reflecting the total weight of the fish caught. (For species such as salmon, which are gutted at sea, landed weights are converted to round weights to provide comparability with other species.) Ex-vessel value represents the amount paid to fishermen at the first point of sale, usually a dockside receiver. Prices are calculated as the total ex-vessel value divided by total pounds landed. Both ex-vessel value and price are

adjusted for inflation using \$US 2007 values as a base. Boat counts represent individual (resident and nonresident) fishing operations, though not necessarily individual fishermen, as some fishermen may own and/or operate multiple boats, and most boats have crew (and possibly multiple skippers), which these counts do not include. Buyer counts are based on the number of unique buyer IDs in the landings data, and include fishermen who land their own catch (e.g., for direct sales to restaurants) as well as buyers who purchase fish from fishermen who deliver their catch at the docks.¹⁴ The number of trips provides a count of the number of deliveries each boat makes at the port.¹⁵ To insure confidentiality, data are not reported for some fisheries and/or years if fewer than three vessels and/or buyers participated.

Average annual landings at Trinidad were 58% higher in recent years than over the long term, largely reflecting increases in crab fishing activity. Ex-vessel value has been 42% higher in recent years relative to the long term, reflecting the combined effect of the 66% increase in crab landings and an 11% decline in crab prices between the two periods. While the number of buyers has increased in recent years by 36%, the numbers of boats and trips have declined by 62% and 32%, respectively (Table 6).

Table 6. Long-term and recent annual average, percent difference, and highs and lows in selected measures for commercial fisheries at Trinidad, 1981–2007.

All fisheries	Long-term average (1981–2007)	Recent average (2003–2007)	Percent difference	High year(s) (amount)	Low year(s) (amount)
Landings (lbs)	849,180	1,340,516	+58	2006 (1,909,551)	2001 (231,935)
Ex-vessel value (\$)	1,699,129	2,404,426	+42	2006 (3,157,485)	2002 (638,115)
Boats	65	25	-62	1982 (221)	2005 (22)
Buyers	11	15	+36	2007 (19)	1988 (6)
Trips	1,538	1,049	-32	1982 (4,651)	2002 (664)
Price (\$/lb)	2.10	1.87	-.11	2001 (2.90)	1993 (1.48)

Annual landings (all species combined) at Trinidad ranged from lows of 232,000–346,000 pounds (in 2001 and 2002) to highs of 1.7–1.9 million pounds (in 2003, 2004 and 2006) (Figure 4, Table 6), averaging about 850,000 pounds over the long term and 1.34 million pounds in recent years. Crab has been the dominant fishery, accounting for 63%–70% of landings between 1981 and 1983 and 91%–99% of landings in every year since. Salmon accounted for 21%–23% of landings between 1981 and 1983 before dropping sharply to zero or near zero most years since. Rockfish/lingcod landings accounted for 5%–7% of landings in 1982, 1989, 1991, 2001 and 2002 but rarely more than 1% in most other years.

Since 1981, ex-vessel value at Trinidad has ranged between lows of \$638,000–\$672,000 (in 2001 and 2002) to highs of \$3.1–\$3.2 million (in 2003, 2004 and 2006) (Figure 5), averaging \$1.7 million over the long term and \$2.4 million in recent years. The crab fishery

has accounted for 91%–99% of total landed value since 1984. Salmon accounted for 34%–36% of landed value in 1981–1982, but its contribution to total value has dropped to zero or near zero most years since. Rockfish/lingcod landings accounted for 5% of landed value in 1989, 2001 and 2002 but rarely more than 1% in other years.

An annual average of 22 boats made landings at Trinidad in recent years, compared to a long-term average of 65 boats. Most of this change is due to the sharp decline in salmon fishery participation following implementation of stringent KMZ management measures beginning in the 1980s. Of the boats that landed at Trinidad between 1981 and 1989, on average, 68% participated in the salmon fishery and 39% participated in the crab fishery. With the decline in salmon fishing opportunities, average annual participation in the salmon fishery dropped to 11%, while it doubled to an average of 80% in the crab

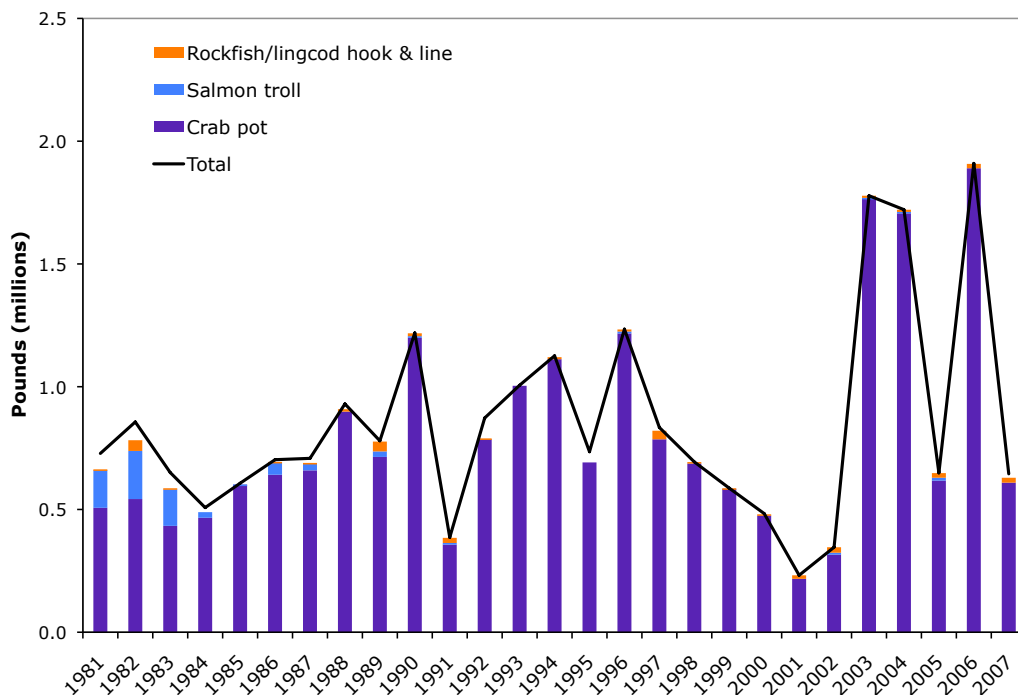


Figure 4. Commercial fishery landings (pounds) at Trinidad for selected fisheries and overall, 1981–2007.
Note: Activity cannot be reported for years when more than zero and fewer than three boats or buyers participated in the salmon troll (1988, 1997, 1999–2000, 2007) and rockfish/lingcod hook-and-line (1984–1985, 1993, 1995) fisheries.

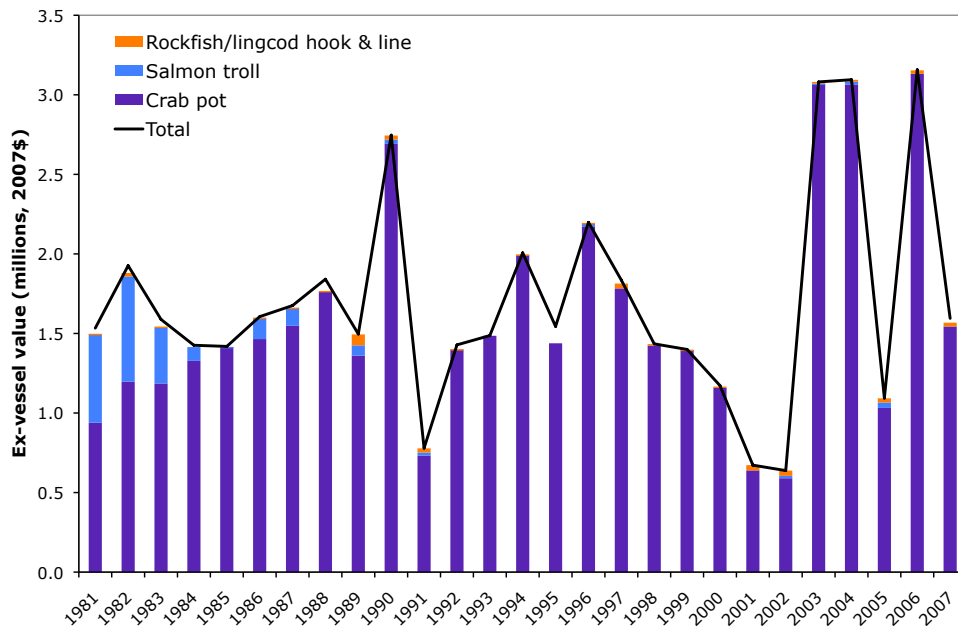


Figure 5. Ex-vessel value (2007\$) of commercial fishery landings at Trinidad for selected fisheries and overall, 1981–2007. Note: Activity cannot be reported for years when more than zero and fewer than three boats or buyers participated in the salmon troll (1988, 1997, 1999–2000, 2007) and rockfish/lingcod hook-and-line (1984–1985, 1993, 1995) fisheries.

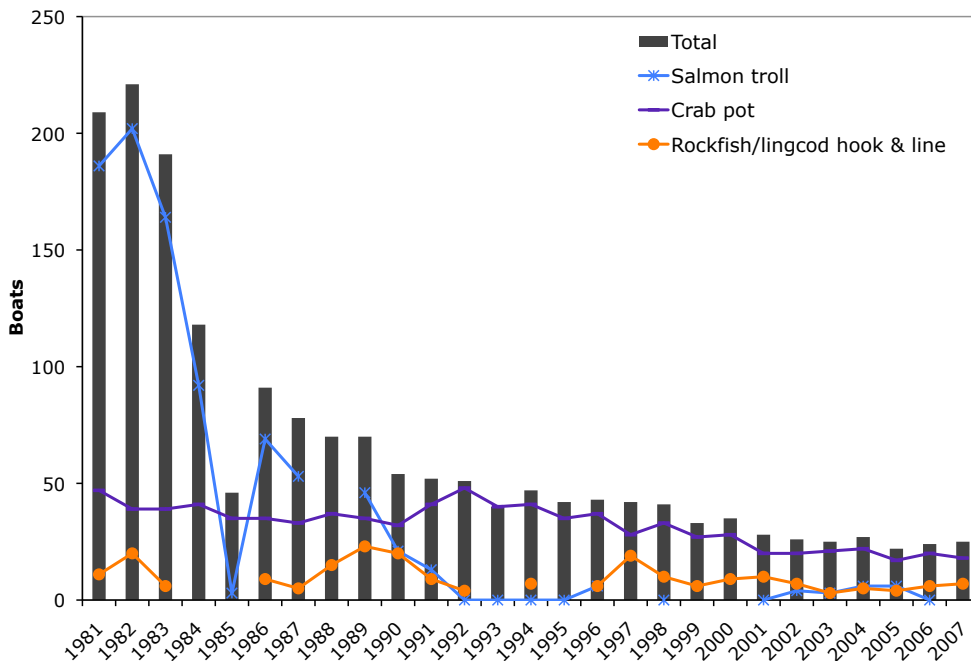


Figure 6. Number of boats with commercial fishery landings at Trinidad for selected fisheries and overall, 1981–2007. Note: Activity cannot be reported for years when more than zero and fewer than three boats or buyers participated in the salmon troll (1988, 1997, 1999–2000, 2007) and rockfish/lingcod hook-and-line (1984–1985, 1993, 1995) fisheries.

fishery after 1989. An annual average of 20% of boats with landings at Trinidad participated in the rockfish/lingcod hook-and-line fishery in recent years, compared to 14% over the long term. However, the numbers of boats with landings in these fisheries has been fewer in recent years relative to the long term. And, although Trinidad historically hosted a large transient fleet (primarily targeting salmon), today nearly all of the boats that land there are resident.

Trinidad’s commercial fishermen make day trips only, but may deliver more than once on a given day. The number of trips at Trinidad declined precipitously from 4,031–4,651 trips between 1981 and 1983 to 664–1,568 trips since 1985 (Figure 7). The average annual number of trips (or deliveries) declined by 32% from an average of 1,538 trips over the long term to 1,049 trips in recent years (Table 6). This change is due largely to the sharp

contraction of the salmon fishery, where the recent average number of trips is 95% less than the long-term average. Crab accounted for an average of 27% of total trips between 1981 and 1983 (when salmon trips were dominant), increasing to an annual average of 92% since 1992 (when salmon became negligible). Crab trips have consistently accounted for more than 90% of deliveries since 1992, except in 1997, 2002 and 2005, when crab was either less abundant or determined (through annual testing) to be unready for harvest at the beginning of the season (CDFG 2006). The number of rockfish trips, while relatively small (and involving a small number of boats), increased 36% from a long-term average of 56 trips to an average of 87 trips in recent years. The number of fish buyers at Trinidad declined from 10–14 from 1981 through 1984 to 7–9 from 1985 through 1993, then increased to 10–19 from 1994 through 2007. On average, about three-fourths of buyers participated in

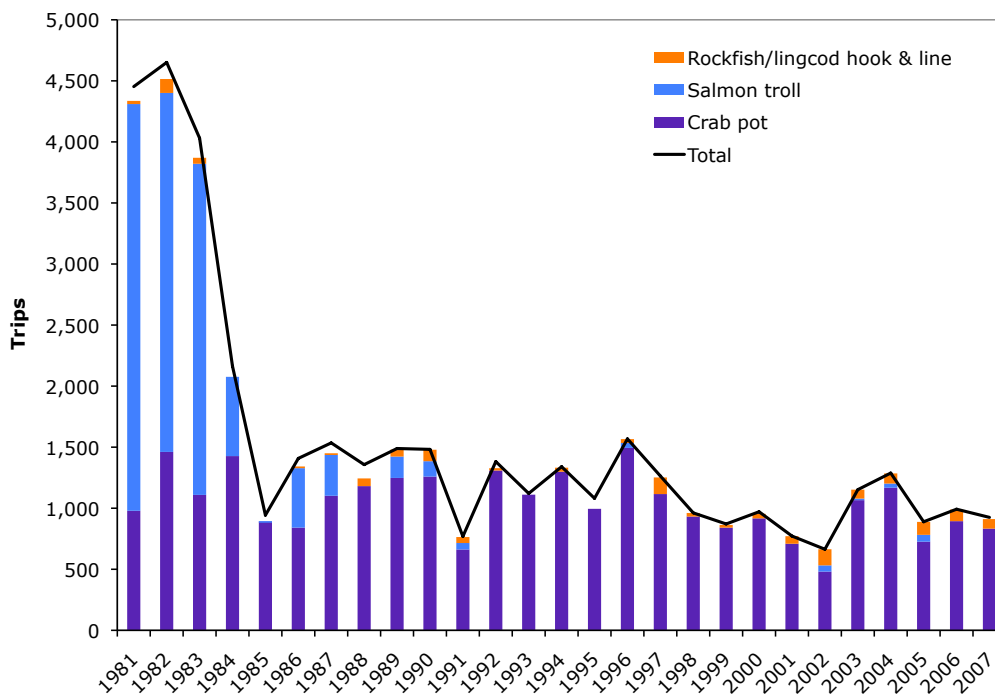


Figure 7. Number of trips by commercial fishing vessels landing at Trinidad for selected fisheries and overall, 1981–2007. Note: Activity cannot be reported for years when more than zero and fewer than three boats or buyers participated in the salmon troll (1988, 1997, 1999–2000, 2007) and rockfish/lingcod hook-and-line (1984–1986, 1993, 1995) fisheries.

the crab fishery over the long term (76%) and the recent term (72%). The average proportion of buyers participating in the rockfish/lingcod fishery (41%) is the same for the two periods. The proportion of buyers participating in the salmon fishery dropped from 27% for the long term to 18% in the recent term.

Of the 19 buyers that received commercially caught seafood at Trinidad in 2007, at least three were local nonfisherman businesses, at least four and as many as eight were local fishermen, and the remainder were buyers based in other locations in Humboldt County, elsewhere in California, and in Oregon and Washington. Although the data show an increase in the number of buyers, fishermen note that the actual number of ‘fish houses’ – large volume fish buyers that process and/or distribute the catch – has declined in the region.

Average annual ex-vessel prices per pound in recent years for all fisheries combined and for the crab fishery are very similar, and are 11% less in the recent term compared to the long term. Likewise, the average recent term price in the rockfish and lingcod fishery is slightly (4%) lower compared to the long term, although average price per pound varied widely (\$0.49–\$3.56) from year to year and likely more so among species within and across years. In contrast, the average annual ex-vessel price in the salmon fishery was 8% greater in the recent term compared to the long term.

The distribution of ex-vessel value among vessels and buyers was examined to determine the extent to which consolidation of fishing activity has occurred. As the number of boats delivering fish to Trinidad dropped over the past decade (1998–2007), the proportion of boats accounting for 90% of the ex-vessel value of landings increased from 39% (16 of 41 boats) to 56% (14 of 25 boats), suggesting

less consolidation of the fleet over time. In contrast, the proportion of buyers accounting for 90% of landed value does not exhibit a clear trend, instead decreasing from 30%–40% in 1998 and 1999 to 6%–17% during the period 2000–2004, then increasing to 13%–26% through 2007. Overall, the data suggest greater consolidation among buyers than vessels, with an annual average of 47% of boats (13 of 29) and 23% of buyers (3 of 13) accounting for 90% of the ex-vessel value of landings for the period 1998–2007.

Activity Within Commercial Fisheries

The Dungeness Crab Pot Fishery

The Dungeness crab fishery has been the primary commercial fishery at Trinidad, accounting, on average, for nearly 80% of landings and 70% of ex-vessel value for the period 1947–1980¹⁶, and 93% of both landings and value for the period 1981–2007. According to fishery participants, some of the best crab grounds along the North Coast are within close range of the harbor and, although their abundance is cyclical, these grounds have generally been very productive. The fishery’s importance has increased since the mid-1980s, filling the void left by the loss of salmon fishing opportunities in the area.

Both over the long term (1981–2007), and in recent years (2003–2007), crab generally accounted for the vast majority of fishing activity (landings, ex-vessel value, boats, trips, buyers) at Trinidad.¹⁷ The one exception is



long-term average vessel participation, where it ranks a close second to the salmon troll fishery. The fishery is highly variable, especially so since 2001, with record high landings (1.7–1.9 million pounds) and revenues (\$3.1 million) in 2003, 2004 and 2006; and record low landings (217,000–316,000 pounds) and revenues (\$590,000–\$631,000) in 2001 and 2002 (Figure 8, Table 7). On an average annual basis, landings and value have been 66% and 49% higher (respectively) in recent years relative to the long term. The increase in value has been tempered somewhat by an 11% decline in prices from \$2.11 per pound over the long term to \$1.88 per pound in recent years.

Fishery participation varied from 33 to 48 boats between 1981 and 1992, then declined, with 18 boats landing crab in 2007 (see Figure 6). Participation peaked at 48 boats in 1992, the year the state placed a moratorium on entry. The number of trips also has declined, though not commensurately with the decline in vessel participation. The number of boats was 39%

lower in recent years relative to the long term, while the number of trips was 10% lower over the same periods, indicating increased effort per boat in the fishery.

The number of buyers increased from 5–8 per year between 1981 and 1993 to 10–12 between 1994 and 1996, then varied between 5 and 11 buyers between 1997 and 2005 before peaking at 16–19 in 2006–2007. The average number of buyers in recent years (11) has been 30% higher than in the long term (8).

Average ex-vessel price for crab ranged between \$1.48 per pound (in 1993) and \$2.94 per pound (in 2001). Prices in recent years averaged \$1.88 per pound, 11% lower than the long-term average of \$2.11 per pound.

The Salmon Troll Fishery

As elsewhere along the North Coast, the commercial salmon fishery was active at Trinidad until the mid-1980s. During the period 1960–1976, salmon landings averaged 113,000 pounds

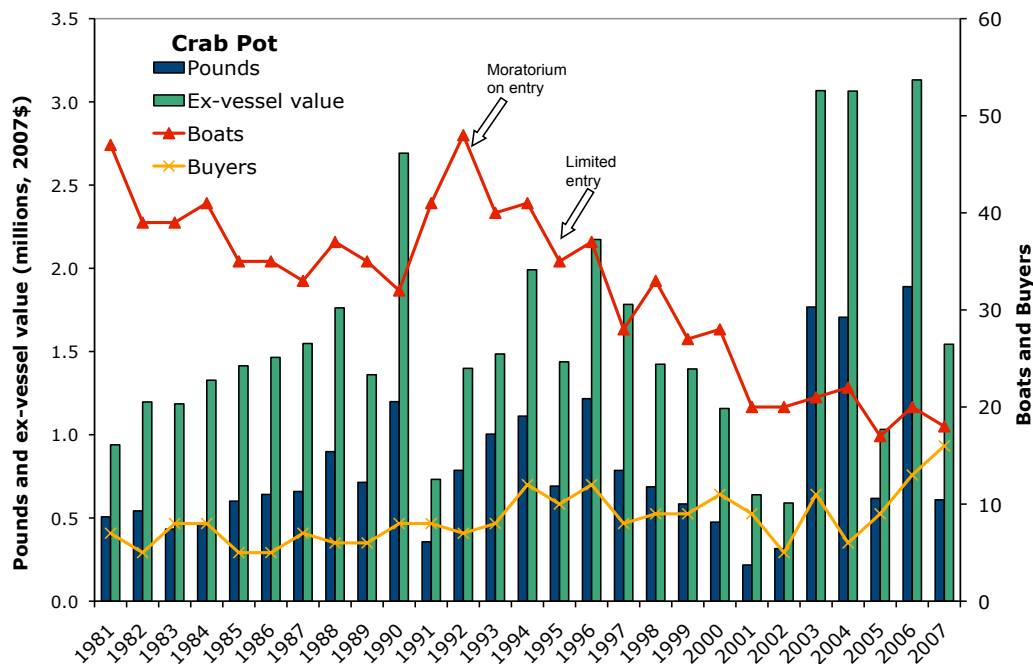


Figure 8. Landings, ex-vessel value (2007\$), and number of boats and buyers for the commercial Dungeness crab fishery at Trinidad, 1981–2007.

Table 7. Long-term and recent annual average, percent difference, and highs and lows in selected measures for the commercial crab pot fishery at Trinidad, 1981–2007.

Crab pot	Long-term average (1981–2007)	Recent average (2003–2007)	Percent difference	High year(s) (amount)	Low year(s) (amount)
Landings (lbs)	795,696	1,317,988	+66	2006 (1,889,823)	2001 (217,456)
Ex-vessel value (\$)	1,590,364	2,404,426	+49	2006 (3,131,998)	2002 (589,986)
Boats	32	20	-39	1992 (48)	2005 (17)
Buyers	8	11	+30	2007 (16)	1982, 1985, 1986 (5)
Trips	1,039	937	-10	1996 (1,494)	2002 (481)
Price (\$/lb)	2.11	1.88	-11	2001 (2.94)	1993 (1.48)

per year worth \$295,000, accounting for an average of 29% of landings and 40% of ex-vessel value of landings at the port (see Figure 2).

Salmon landings declined precipitously from 196,000 pounds in 1982 to 500 pounds in 1985, increased to 51,000 pounds in 1986, then experienced a second decline that persists to this day (Figure 9, Table 8). Ex-vessel value

declined similarly, from \$661,000 in 1982 to \$1,700 in 1985, followed by a secondary peak of \$132,000 in 1986 and another, more persistent decline through 1991. The initial declines in salmon activity occurred following the state’s implementation of limited entry in 1982, increasingly shorter seasons in the California KMZ, and a complete closure of the KMZ in 1985. No salmon fishing activity occurred in

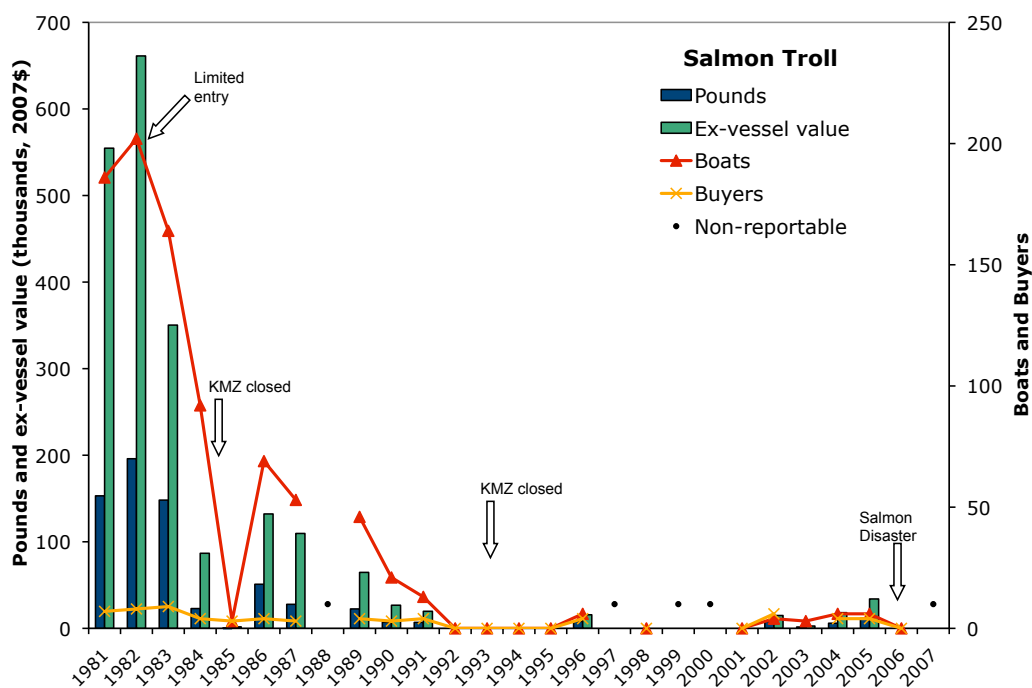


Figure 9. Landings, ex-vessel value (2007\$), and number of boats and buyers for the commercial salmon troll fishery at Trinidad, 1981–2007. Note: Activity cannot be reported for years when more than zero and fewer than three boats or buyers participated (1988, 1997, 1999–2000, 2007).

seven of the 16 years between 1992 and 2007, and cannot be reported for five years (including 2007) due to the small number of participants.

Fishery participation declined from 186–202 boats in 1981 and 1982 to three boats in 1985, increased to 69 boats in 1986, and declined thereafter. Salmon trips declined from 2,900–3,300 trips in 1981 and 1982 to three trips in 1985, increased to 487 trips in 1986, then declined again (see Figure 7). The number of salmon buyers ranged from seven to nine between 1981 and 1983, and has exceeded four buyers in only one year since 1984.

Salmon fishing activity is much lower in recent years relative to the long term, with landings, value, boats and trips down 84%, 86%, 90% and 95%, respectively. Because salmon activity at Trinidad has been modest to negligible since the mid-1980s, the long-term averages tend to mute the differences between the high level of activity in the early- to mid-1980s and subsequent years.

From 1981 through 1991, average annual ex-vessel salmon prices ranged between \$2.36 and \$3.95 per pound (round weight), then declined to \$1.72–\$2.40 during the period 1992–2003. Prices increased to about \$3.00 per pound during the period 2004–2006

and nearly doubled in 2007 (although the average 2007 price per pound is not reported to ensure confidentiality). However, although ex-vessel salmon prices have increased quite dramatically in recent years, these changes have yielded little benefit for Trinidad’s much-diminished salmon fishery.

The Rockfish/Lingcod Hook-and-Line Fishery

The commercial hook-and-line fishery for rockfish and lingcod is a small but persistent fishery at Trinidad. Activity has been highly variable, with landings peaking at more than 35,000 pounds in 1982, 1989 and 1997, and value peaking at \$69,000 in 1989 (Figure 10, Table 9). Interspersed with these peak years are years of low activity, some of which cannot be reported due to the small number of participants.

Average annual landings and ex-vessel value were 7% and 10% higher, respectively, in recent years relative to the long term. The ex-vessel value of landings remained well below \$10,000 per year through much of the 1980s. Ex-vessel values in most years since 1989 suggest the influence of the growing Asian (domestic and export) market for fresh groundfish. Continuing production for the fresh (versus live) fish market,

Table 8. Long-term and recent annual average, percent difference, and highs and (nonzero) lows in selected measures for the commercial salmon troll fishery at Trinidad, 1981–2007. Note: No landings occurred in 1992–1995, 1998, 2001 and 2006. Years when fewer than three boats or buyers participated are included in averages, but excluded from highs and lows.

Salmon troll	Long-term average (1981–2007)	Recent average (2003–2007)	Percent difference	High year(s) (amount)	Low year(s) (amount)
Landings (lbs)	30,490	4,806	-84	1982 (195,936)	1985 (514)
Ex-vessel value (\$)	95,134	13,698	-86	1982 (661,234)	1985 (1,745)
Boats	40	4	-90	1982 (202)	1985, 2003 (3)
Buyers	3	3	0	1983 (9)	1985, 1987, 1990 (3)
Trips	500	26	-95	1981 (3,331)	1985 (3)
Price (\$/lb)	2.01	1.92	-4	1987 (3.95)	1996 (1.96)

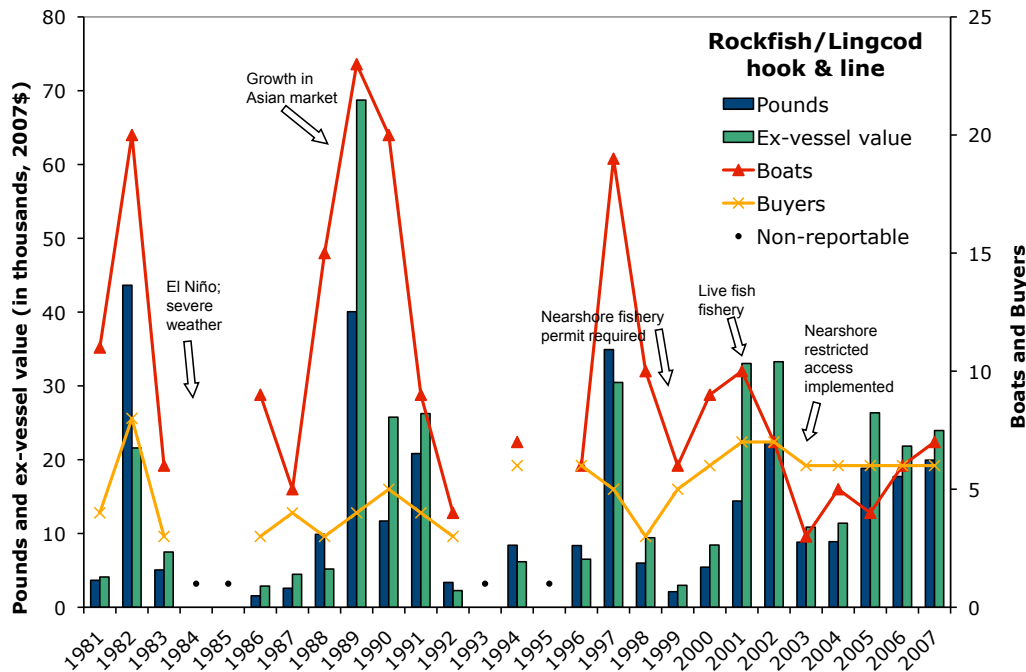


Figure 10. Landings, ex-vessel value (2007\$), and number of boats and buyers for the commercial rockfish/lingcod hook-and-line fishery at Trinidad, 1981–2007. Note: Activity cannot be reported for years when more than zero and fewer than three boats or buyers participated (1984–1986, 1993, 1995).

Table 9. Long-term and recent annual average, percent difference, and highs and lows in selected measures for the commercial rockfish/lingcod hook-and-line fishery at Trinidad, 1981–2007.

Rockfish/lingcod hook-and-line	Long-term average 1981–2007	Recent average (2003–2007)	Percent difference	High year(s) (amount)	Low year(s) (amount)
Landings (lbs)	14,843	18,900	+7	1982 (43,638)	1986 (1,554)
Ex-vessel value (\$)	17,106	18,879	+10	1989 (68,730)	1992 (2,266)
Boats	10	5	-50	1989 (23)	2003 (3)
Buyers	5	6	+19	1982 (8)	1983, 1986, 1988, 1992, 1998 (3)
Trips	62	87	+41	1997 (136)	1986, 1987 (14)
Price (\$/lb)	1.31	1.27	-3	2001 (2.29)	1982 (0.49)

especially given local demand and Trinidad’s remoteness from San Francisco Bay area, however, limits the live market’s influence. Vessel participation peaked at 19–23 boats in 1982, 1989, 1990, 1997, with 1–15 boats participating during the remaining years. Participation in the state-managed nearshore fishery was capped in 1999 and limited more

sharply in 2003 with the implementation of restricted access, which applies to several (but not all) of the groundfish species targeted by Trinidad’s commercial fishermen. The number of trips peaked in 1982, 1997 and 2002. Comparing the recent term to the long term, the number of boats participating in the fishery has declined by 50%, but trips have increased

by 41%, indicating an increase in average effort per boat.

The number of rockfish/lingcod buyers is 19% greater in the recent term compared to the long term, ranging from one to eight during the period 1981–1999, and 6 to 7 since 2000. Most of these buyers are fishermen marketing their catch to local groceries and restaurants.

The modest difference (-3%) in recent ex-vessel prices relative to the long term masks the price fluctuations that have characterized this fishery over time. Average price per pound varied from \$0.49 to \$2.20 between 1981 and 1991, stayed below \$1.00 from 1992 through 1997, then ranged from \$1.23 to \$2.29 through 2007.

Commercial Fishery Combinations

Commercial fishery participants move among fisheries, ports and fishing areas in response to changes in resource availability, regulations, weather and other factors. Reflecting the highly constraining nature of regulations in recent years, one fisherman noted, “You follow the seasons, the regulations, not so much the fish.” Examination of fishery combinations provides insight into the changing nature of individual operations as well as the community.

For purposes of identifying trends in fishery participation, it would be reasonable to focus on boats that are resident (homeported) in Trinidad. However, although recent data on resident vessels were collected as part of the fieldwork for this project, similar data for earlier years are not readily available. Thus, in lieu of focusing on resident vessels, we focused on those boats that earned a plurality (i.e., the greatest proportion) of their annual ex-vessel revenues from Trinidad landings (hereafter referred to in this section as ‘Trinidad boats’). While there may be some coincidence between port of residence and the port accounting for plurality of revenue, one is

not necessarily a good proxy for the other. Figure 11 illustrates the one- and two-way fishery combinations characteristic of ‘Trinidad boats’ during three time periods: 1981–1983, 1993–1995 and 2005–2007. The numbers in each box indicate the average annual number of vessels that participated exclusively in that fishery in each of the three periods. For example, an annual average of 126 boats participated only in the salmon troll fishery during the first period (1981–1983), none participated only in this fishery during the second period (1993–1995), and an average of fewer than three participated during third period (2005–2007). The numbers on the lines connecting two boxes indicate the average number of vessels that participated exclusively in the fisheries denoted by those two boxes. For example, the line connecting the salmon troll and crab pot boxes indicates that an annual average of 20 vessels participated in both the salmon and crab fisheries (only) during the first period, and fewer than three participated during the second and third periods.

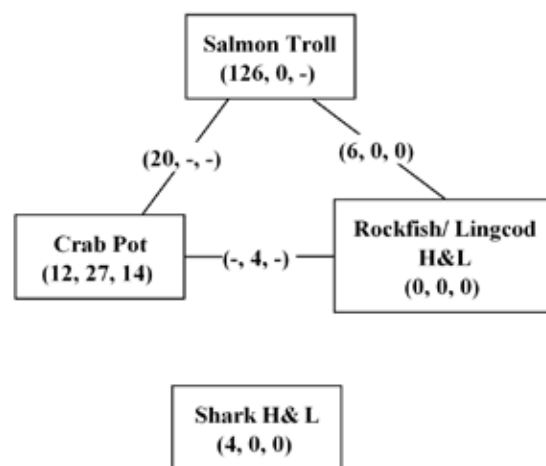


Figure 11. Major one- and two-way fishery combinations utilized by Trinidad boats (three-year averages: 1981–1983, 1993–1995 and 2005–2007). Note: “-” indicates fishery combinations involving one or two boats; not reported to insure confidentiality.

A number of fisheries and fishery combinations that existed in 1981–1983 are no longer pursued (or are pursued by too few boats to report). The most notable changes are the dramatic reduction in salmon troll-only vessels and lesser reductions in salmon troll combination vessels. The number of crab-only vessels more than doubled between the 1981–1983 and 1993–1995 periods, then declined to previous levels during the period 2005–2007. The shark fishery is an anomaly, with landings made only in 1983 by 12 boats (thus averaging four boats for the period). The only three-way combination that can be reported is salmon troll/crab pot/rockfish hook-and-line, which was pursued by an average of four Trinidad boats during the period 1981–1983 but fell to zero in the two subsequent periods.

Study participants noted many of the changes depicted in the fishery combinations, emphasizing the importance of salmon for resident and nonresident fishermen in the early 1980s, the subsequent departure of the summer mosquito fleet that targeted salmon, and the increased emphasis on crab for the boats that remained. They also cited changes in nearshore fishery management, especially the implementation of limited entry in 2003, after which only two resident fishermen qualified for permits.

In addition to participating in commercial fisheries, about a third of Trinidad’s resident commercial skippers operate their vessels as charter boats. This pattern of integrating commercial fishing (primarily in the winter) and recreational fishing (primarily in the summer) has become more common at Trinidad in recent years with increasing commercial fishery regulation. Local fishermen report that running charters is lower-paying but “steady work” that requires keeping to a schedule, while commercial fishing is more variable and uncertain, but affords more flexibility and opportunities for significant earnings for a single trip (or season).

The loss of salmon and groundfish fishing opportunities has also led some Trinidad fishermen to move to more southerly areas that are open for the summer salmon season. However, with the reduction in salmon fishing opportunities elsewhere as well as locally, and strong (if somewhat variable) local crab fishery conditions, more fishermen are staying in the area, with some working in land-based jobs when they are not fishing.

Revenue Per Boat

Trends in aggregate revenues do not necessarily correlate with how individual vessels may be faring in terms of revenue. To illustrate this point, we estimated average annual revenue per boat for those that earned a plurality (i.e., the greatest proportion) of their annual ex-vessel revenues from landings in Trinidad. For the remainder of this section (as in the previous section), ‘Trinidad boats’ refers to boats that meet this plurality of revenue criterion.

The number of ‘Trinidad boats’ declined from 183 in 1981 to 21 in 2007 (Figure 12). The decline was particularly precipitous in the early 1980s, reflecting the dramatic decline in salmon fishing opportunities. Average annual revenue per boat (based on each vessel’s landings in all ports and fisheries) was consistently less than \$15,000 prior to 1985, when salmon-only operations were the most among Trinidad boats. Average annual revenue per boat ranged from \$23,000 to \$69,000 between 1985 and 2002, and reached highs of \$131,000–154,000 after 2002, with crab-only operations as the most common fishery combination.

To illustrate how vessel revenue is affected by fishery-specific participation, we assigned each Trinidad vessel to its ‘principal fishery’, that is, the fishery from which the boat derived the plurality of its annual revenue. For vessels associated with each principal fishery, we then estimated annual revenue per boat (based on their landings at all ports and in all fisheries). Estimates for 1981–1983, 1993–1995 and 2005–

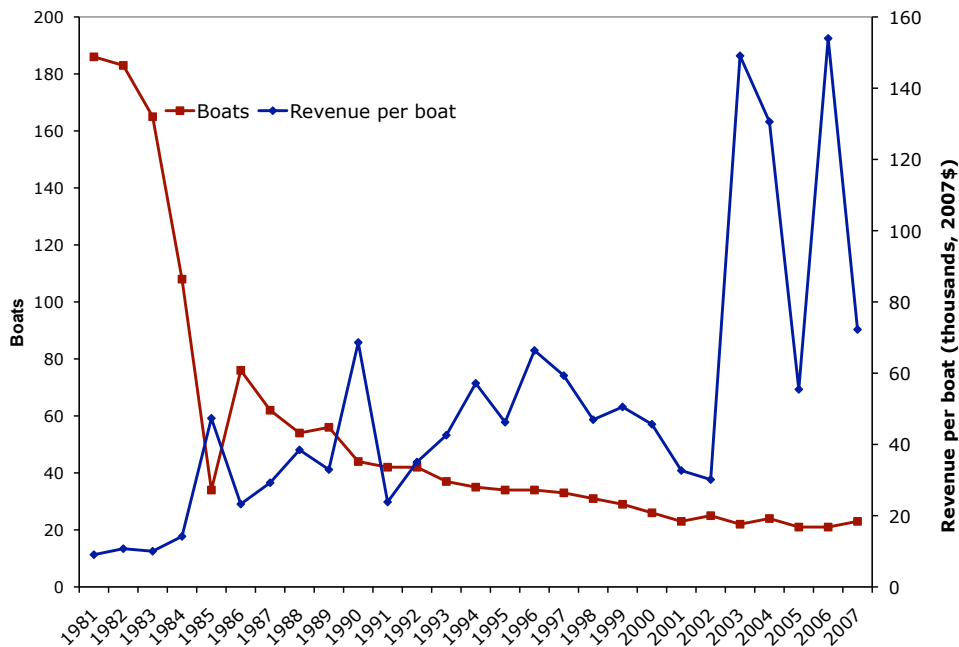


Figure 12. Number of boats with plurality of revenue from landings at Trinidad, and average annual revenue per boat (2007\$, all ports, all fisheries), 1981–2007.

2007 indicate a significant decline in the number of vessels whose principal fishery was salmon troll, and a lesser though substantial decline in the number of crab pot vessels (Table 10). The low revenues in the early 1980s reflect the predominance of salmon trollers (many of them part-time commercial fishermen) in the Trinidad fleet at that time, while the high revenues in

recent years reflect the predominance of crabbers and the upsurge in the crab fishery. Whether this recent upswing is indicative of future trends is uncertain, given the high degree of variability in the crab fishery. The extent to which increases in revenue per vessel have kept pace with increasing costs is also unclear.

Table 10. Average annual number of Trinidad boats and average annual revenue per boat (2007\$), by major fishery and overall, 1981–1983, 1993–1995 and 2005–2007. Note: At least three unique boats participated in the rockfish/lingcod H&L fishery during the 1981–1983 and 1993–1995 periods. Salmon troll data cannot be reported for 2005–2007, when more than zero but fewer than three boats or buyers participated.

Major Fishery	Number of boats			Average annual revenue per boat (All ports, all fisheries)		
	1981–1983	1993–1995	2005–2007	1981–1983	1993–1995	2005–2007
Salmon troll	140	0	-	\$3,163	\$0	-
Rockfish/lingcod H&L	2	1	3	\$1,798	\$5,353	\$5,738
Crab pot	33	34	18	\$39,813	\$48,777	\$112,247
All boats	178	35	22	\$9,929	\$48,663	\$93,900

RECREATIONAL FISHERY ACTIVITY AT TRINIDAD HARBOR

Given the limitations on salmon fishing, ocean anglers at Trinidad have increasingly targeted groundfish, especially rockfish, lingcod and halibut. Groundfish is viewed by community members as a second choice to, but not a substitute for, salmon. In addition, with rich fishing grounds within and near Trinidad Bay, many local anglers also target crab in the winter. Some anglers participate in the recreational albacore fishery in the late summer and early fall, but only if the resource is within about 10 miles of the coast.

This section focuses on recreational ocean fishing activity associated with Trinidad Pier, and is based primarily on CPFV (charter) logbook data collected by CDFG and field data collected for this project. Effort estimates from the California Recreational Fisheries Survey (CRFS), which are available only at the ‘district’ level, are used to place Trinidad’s recreational fisheries in context.¹⁸ The CPFV trends described here must be viewed with caution, as confidentiality rules limit the reporting of data in some years and because not all CPFV operators comply with the logbook requirement. In the discussion of CPFV activity below, the *long term* is the period from 1980 through 2007, whereas *recent years* pertains to the most recent five years of the time series (2003–2007).¹⁹

We use four measures of fishing activity derived from recreational fishery data. ‘Boats’ are counted as the number of unique CPFVs that operated in a given year. A ‘boat trip’ represents a combined departure and return of a boat, regardless of trip length. An ‘angler trip’ is defined as one angler spending part or all of one or more days fishing before returning to the location where the trip began. An ‘angler day’ is defined as one person’s fishing on a given day. For example, two anglers each fishing for three days are counted as six angler days.

According to the CRFS, an annual average of 143,300 angler trips were made in the Redwood District (comprised of Del Norte and Humboldt counties) during the period 2005–2007. About 34% of these trips were from manmade structures, 32% from beach/bank, 31% from private boats, and 4.3% from CPFVs. It is difficult to determine how much of the recreational effort in the Redwood District occurs in the Trinidad area, as the CRFS does not provide effort estimates by port.

Charter Fishing Activity

Based on our analysis of the CPFV logbook data, annual activity averaged three boats over the long term and five boats in recent years, a 68% increase between the two periods (Figure 13). Participation dropped below three boats in 14 of the 28 years (1980–1983, 1985–1987 and 1994–2000), precluding the reporting of data for those years. The average numbers of boat days and angler days were also higher in recent years (2003–2007) relative to the long term (1980–2007), with boat days increasing 95% from 181 to 354, and angler days increasing by 84% from 1,039 to 1,914. Between 2001 and 2007, participation increased from three to seven boats. According to study participants, seven boats remained active through 2008 but that number dropped to six boats by the summer of 2009. Most of these trips were half-day trips that targeted rockfish and other groundfish species on nearby fishing rounds, along with winter crabbing.

Trinidad’s CPFV activity has increased as a proportion of Redwood District activity in recent years relative to the long term. Trinidad accounted for an annual average of 75% of boats, 81% of boat trips and 79% of angler trips in the district in recent years. Based on logbook data, Trinidad thus appears to be the major recreational port in Northern California for charter activity.

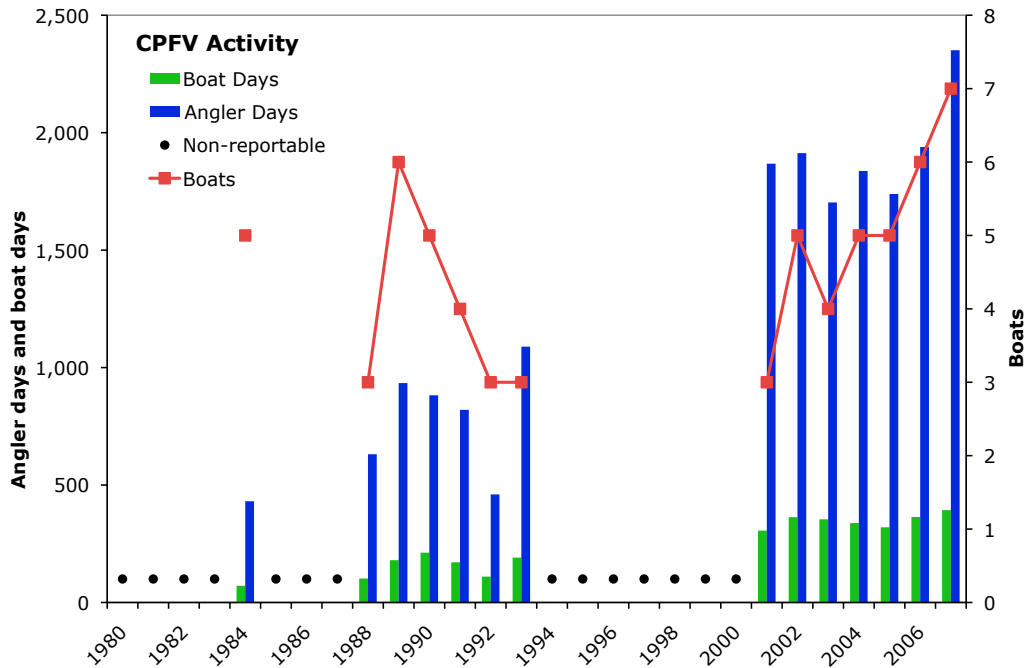


Figure 13. Charter fishing activity at Trinidad, 1980–2007. Note: CDFG CPFV logbook data. Activity cannot be reported for years when more than zero but fewer than three boats participated (1980–1983, 1985–1987, 1994–2000).

Private Boat Fishing Activity

Although port-specific data on private boat fishing activity are not available, study participants reported that this mode of fishing far exceeded CPFV activity through the 1980s and into the early 1990s. Sharp reductions in KMZ season length, as well as bag limit reductions and prohibitions on coho retention, however, led to a sharp decline in private boat activity. According to the harbor manager and other sources, recreational mooring use declined from about 400 boats in the early to mid 1980s to about 90 in 2008. In that same time period, beach and launch ramp use also has declined. Nonetheless, even as private boat activity has decreased, private boat fishing (resident and nonresident alike) continues to play an important role at Trinidad.



KEY FACTORS AFFECTING TRINIDAD HARBOR FISHERIES

Trinidad's fisheries and fishing community have experienced considerable social and economic change over the past 30 years. Regulatory, market and environmental factors have influenced individuals and communities, sometimes gradually and at other times more abruptly. Some of these factors originated locally, while others are regional, national or even international in nature. Moreover, these forces do not operate in isolation. Rather, they interact in complex and cumulative ways, posing both challenges and opportunities to the viability and resilience of the Trinidad fishing community. The following discussion focuses on specific factors highlighted by study participants as having most influenced local fisheries, infrastructure, and the community as a whole.

Regulatory Factors

Salmon Fishery Management

Participants reported that increasingly stringent salmon management from the mid-1980s through the early 1990s, more than anything else, changed the landscape of fishing at Trinidad. As new state permitting requirements and KMZ closures limited commercial fishing activity, the 'mosquito fleet' that had become the centerpiece of Trinidad's fishing community in the summer diminished, with some shifting to recreational fishing or moving their operations to other areas where salmon fishing opportunities were available. The Trinidad Harbor fishing community, which had been built on salmon fishing, experienced a dramatic reduction in participation and activity. As an indicator of this change, the harbor has gone from having 400 fully occupied summer moorings in the early 1980s to fewer than 100 (and used more sporadically) in recent years (Dean Runyan Associates 2001).

The reduction in fishing activity over time affected local businesses, such as smokehouses, tackle shops, grocers and RV Parks, which depended on the seasonal influx of visitors and burst of economic activity. One study participant noted:

We're a close-knit community; we help each other out. All fisheries [participants] know each other. Sixteen years ago, the snapshot was: Katy's was always busy, they were the only vacuum-sealer around. Murphy's [Grocery Store] would store fish for people. You could clean your fish on or in the water.

Some businesses closed, while others diversified or shifted their emphasis. For example, two local smokehouses closed, and Salty's, a local bait and tackle shop, diversified to provide goods and services used for surfing and river fishing. As the number of commercial fishery participants dropped off, so did dockage and mooring revenues. The Rancheria has adjusted by increasing dockage and offloading fees for commercial fishing operations.²⁰

Amid these changes, a core fleet of commercial fishermen remained, increasing their activity in the winter crab fishery. Commercial fishermen who had been operating charters during the summer season began to rely more on those as



well, and over time the charter fleet increased. The response to more recent limitations on the salmon fishery reflects ongoing adaptation to reduced salmon fishing opportunities, especially since the early 1990s. Regarding the three-day 2007 salmon season, a charter operator noted:

[My crewman/relief captain] took customers salmon fishing in 2006. Those customers planned their vacation for the same time and place the next year, but the season was closed. So we focused on rockfish. Most of our customers [now] ...like rockfish because they're easy to catch. If there was coho [allowed] or the KMZ was open, fishing would be very different.

Groundfish Fishery Management

Federal groundfish and state nearshore fishery management followed salmon as key regulatory factors that have shaped Trinidad's commercial and recreational fisheries. Study participants highlighted federal landing limits for the species they target and the state's limited entry program for the commercial nearshore fishery.

Historically, a number of Trinidad's resident commercial fishermen participated in the rockfish fishery when they were not fishing for salmon or crab. According to one study participant, "There was a rockfish fishery, but it wasn't very profitable. Trawl fleets fished nearby. Up until about two to three years before the (federal West Coast groundfish trawl buyback, they were pretty wide operating. Drag fish and rockfish weren't worth very much." The emergence of the live fish fishery changed this somewhat, although increasingly strict catch limits in all sectors of the fishery in recent years together with the implementation of restricted access program in the state's nearshore fishery in 2003 have limited participation and production. In addition to

directly limiting catch, these limits have made it cost-prohibitive for most buyers to purchase and transport the relatively small amounts of fish landed at Trinidad.

CPFV operators and recreational anglers highlighted recent time and area closures to protect yelloweye rockfish as further diminishing local fishing activity in 2007 and 2008. This, coupled with the 2008 salmon closure, eliminated most local recreational fishing opportunities. According to the harbormaster:

...salmon people plan to come here and fish for the whole summer, from all over the country, but now they won't [due to 2008 salmon closure]. Luckily I didn't order any salmon gear for the tackle shop but I know the other gear stores did. You can fish for rockfish, but it only takes a couple times before you have more than you need.

This event further depressed revenue-generating activity in and around Trinidad Pier and, according to several study participants, negatively affected the community's sense of well-being.

Water Quality Management

Trinidad fishing community members highlighted challenges to the pier, associated infrastructure and services following from Trinidad's status as an ASBS/CCA. Fishery-related water quality concerns identified by the Rancheria include leakage from septic systems at the harbor and pier runoff, both nonpoint sources of pollution that are 'prohibited discharges', as defined by the State Water Resources Control Board (SWRCB) because they contain pollutants and violate the 'zero discharge' rule for ASBSs (Savage and Sundberg 2009). (Such discharges are also an issue for the City of Trinidad.) The pier runoff was due in part to waste from the fish cleaning

station that served charter operators and private boat and pier anglers. The harbor also provided a boat washing service that used bleach to better clean boat hulls. In 2007, the Rancheria removed the fish cleaning station from the pier, and replaced the use of bleach with a pressure washer for boat cleaning (Savage and Sundberg 2009). They also plan to improve restroom facilities in 2010 (Trinidad Rancheria 2009).

The removal of the fish cleaning station, in particular, has had broad practical and social impacts. Without a place to clean their catch at the harbor, many anglers have resorted to dumping their fish carcasses along nearby county roads. In addition, the station's removal eliminated an important focal point for the community and a draw for visitors. One study participant noted:

We no longer have a fish cleaning station. That was a social feature. You'd go check out what the fishing had been like...Now there are fish carcasses along Scenic Drive. Anyone who came to the pier went to Seascape [Restaurant]. They were enthralled by people's catch and cleaning the fish, and would want to go fishing.

The larger and more challenging issue is the replacement of the aging pier itself, a critical need that is shared among recreational and commercial fishery participants, support businesses and the community. The pier was built several decades ago with creosote-treated pilings and pressure treated wood. By SWRCB standards, the pier's decking and deteriorating pilings were identified as a nonpoint source of contaminated runoff and a hazard to the ASBS (Savage and Sundberg 2009). Given that the existing pier does not meet water quality standards (and other standards established since its construction in the late 1940s), the Rancheria is seeking to replace

it. To date, they have secured funding from several sources including the California State Coastal Conservancy, the Headwaters Fund and the State Water Resources Control Board (SWRCB) to support various aspects of the pier reconstruction project. However, securing full funding for the project, estimated to cost \$8 million²¹, poses a significant challenge, especially given variability in resource availability and regulatory uncertainty. These circumstances make it unclear what future use – and revenues to the pier needed to maintain facilities and services – will look like.

Economic Factors

Economic factors highlighted by study participants and evident in the course of the research for this project focused on new and increasing costs and uncertain or declining revenues. Some of these, such as increasing gear and fuel costs, are common in the larger economy and across most fisheries. Others, most notably the replacement of the pier, are specific to Trinidad, but are analogous to other ports in the region, where maintenance, repair and replacement of fishery-support infrastructure are at issue.

Increasing Costs and Variable, Uncertain or Declining Revenues

Several fishery participants and support business operators cited the high cost of fuel, which rose to more than \$4 per gallon at the time of this study. (Fuel prices subsequently declined, and varied between \$2 and \$2.60 per gallon before tax.²²) Some fishermen adapted by teaming up on a single vessel and sharing the cost. Support business operators reported they felt that high fuel costs, coupled with the broader economic downturn as well as fishery closures, contributed to reduced demand for their goods and services. Commercial crab fishermen cited increasing gear costs, noting:

The cost of traps has gone through the roof. All the materials cost \$83 per trap last year; it's \$115 this year.²³ Six or seven years ago, it was \$65–67 a trap. Buoys are \$8.15 and \$3 apiece. [They come in two sizes.] So altogether [with other materials], each trap costs us \$150 apiece. The bridles alone are worth \$3–4 apiece.

Fishermen also noted increasing dockage and offloading fees, as well as the 1.24% assessment levied on the ex-vessel value of their crab catches to help repay the federal West Coast groundfish trawl buyback loan.²⁴

Commercial fishermen also expressed concerns about variable and uncertain revenues because of the natural variability in crab stocks and regulatory constraints on rockfish (and salmon) fishing. In general, recent average ex-vessel revenues per boat from landings at Trinidad only (about \$96,000) are more than twice those for the long term (about \$41,000). (This excludes revenues from landings at other ports.) Although ex-vessel revenues have been

considerably greater most years since 2003 compared to previous years, they are also much more variable (Figure 5). In addition, it is not clear whether revenues have kept pace with increasing costs.

For the Rancheria, the cost of replacing the pier together with variable and uncertain revenues from its use are of central concern. In addition to the pier's function as a tribal investment, it directly or indirectly supports 60 local tribal and nontribal families, and generates activity that supports 25 local businesses, according to a May 2005 survey done for the Rancheria (Sundberg pers. comm.). Replacing the pier is more costly because of the stringent ASBS/CCA-driven water quality standards. In addition to dockage and offloading fees, the Rancheria depends on fees for mooring rentals, boat launches and boat washing, used primarily by recreational fishermen. However, these sources of revenue, too, have become less reliable following recent declines in recreational use, linked to regional fishery closures.

CURRENT SITUATION AND OUTLOOK

Trinidad Harbor's fishing community faces challenges as it continues to adjust to changes in fishing opportunities, as well as requirements stemming from the area's designation as an ASBS/CCA. Of particular concern to fishery participants are continued access to fishery resources, especially in light of the North Coast MLPA process begun in late 2009, maintaining and/or increasing business (the influx of recreational anglers and other tourists), and replacement of an aging pier that is central to the identity and viability of the fishing community.

Following fundamental change in salmon fishing opportunities, the commercial fleet now consists almost entirely of resident fishermen who have become highly dependent on the crab fishery. In the recreational sector, the level of private boat fishing activity has declined substantially, although charter activity – targeting rockfish and other groundfish species – has increased. In fact, both commercial and charter activity at Trinidad have grown over time, as measured by landings and ex-vessel revenue in the former and boats, trips and angler days in the latter. Yet each sector's primary dependence on a single fishery makes it vulnerable to fluctuations in resource availability and further regulation. Moreover, Trinidad's commercial fishermen and CPFV operators, many of whom are second or third generation fishermen (including some in their 50s and 60s), are concerned about the financial and regulatory hurdles to new participants, including their own children.

The cumulative effects of reduced opportunities in the salmon and rockfish fisheries, higher costs, and the broader economic downturn have put a strain on some members of the Trinidad fishing community, especially those dependent on seasonal recreational fishing activity. Lost revenues together with regulatory and economic uncertainty have made it difficult for local business owners to plan ahead (e.g., place preseason orders for salmon gear, hire summer staff). Potential visitors, in turn, may be deterred from making plans to visit, as occurred in 2008. This same uncertainty is a challenge to the Rancheria as it pursues comprehensive planning for the Trinidad Pier and the harbor area.

Yet the Trinidad Harbor fishing community is in a unique position for addressing these challenges. First, its infrastructure needs are modest compared to other more developed sites. As a natural harbor with a pier, launch ramp and moorings only, there are no navigation channels or slips to be maintained. Second, Trinidad's fishing community consists of a small but substantially integrated group, with many individuals taking part in both commercial and recreational or subsistence fishing activities. Each group has particular needs, but most individuals recognize that their respective needs and the options for meeting them are interdependent. Finally, the pier's private ownership affords operational flexibility (within broader regulatory constraints) that publicly managed facilities do not have. These features lend the Trinidad Harbor fishing community a degree of resilience that may enable it to effectively address the challenges and opportunities that lie ahead.

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ENDNOTES

- ¹ http://www.coastal.ca.gov/nps/Web/cca_critdesc.htm, accessed 7/30/10. See Appendix B for a glossary with definitions of these and other key terms used throughout this report.
- ² Shore-based ocean, inland and river fisheries, clam digging and other collecting activities - both tribal and nontribal — are also integral to the community and the region, but are beyond the scope of this report.
- ³ See Appendix C for further methodological information.
- ⁴ Yurok ancestral lands include the Lower Klamath River and the California coast from Little River (south of Trinidad) north to Damnation Creek (south of Crescent City; Sloan and Rocha 2007).
- ⁵ The Tsurai village lands are currently owned by the City of Trinidad and managed by the Tsurai Ancestral Society, which includes descendents of the original inhabitants.
- ⁶ Passage of the federal Fishery Conservation and Management Act in 1976 (PL 94-265) led to the establishment of eight regional management councils, including the PFMC.
- ⁷ Regulations have generally been more restrictive in the California KMZ than the Oregon KMZ, reflecting somewhat different policies regarding how much fishing opportunity each state is willing to forego in the KMZ to maintain opportunity in other areas.
- ⁸ The tribal allocation was upheld in *Parravano v. Babbitt*, 70 F.3d 539 (9th Cir. 1995), cert. denied, 518 US. 1016 (1996).
- ⁹ See Ralston (2002) for a discussion of the biology of West Coast groundfish and how growing understanding of that biology affected PFMC management.
- ¹⁰ Pacific ocean perch, bocaccio and lingcod were declared overfished in 1999, canary rockfish and cowcod in 2000; darkblotched and widow rockfish in 2001; and yelloweye rockfish in 2002. Lingcod was declared rebuilt in 2005. In 2009, Petrale sole was declared overfished.
- ¹¹ See Leet et al. 2001 and Starr et al. 2002 for descriptions of these fisheries and gear types.
- ¹² A 2005 survey of Trinidad Harbor employment conducted for the Rancheria identified 34 crew and 22 skippers associated with 22 fishing operations (Trinidad Rancheria unpub. data). Some of those operations have moved or left fishing since.
- ¹³ The 1981 start date for this analysis is based on the availability the Pacific States Marine Fisheries Commission's PacFIN database, which integrates Washington, Oregon and California commercial fishery landings data to provide a consistent coast-wide electronic record of landings from 1981 forward. The PacFIN data for California are based on the C-MASTER data provided by CDFG to the PacFIN program.
- ¹⁴ An entity is counted as a buyer in a given year if it receives at least one delivery. In reality, the number of active buyers capable of regularly receiving the catch from multiple boats is considerably smaller.

- ¹⁵ Because multiple species may be caught during a fishing trip, trips are measured by assigning each delivery to the fishery accounting for the greatest (i.e., plurality of) ex-vessel value associated with that delivery. In some cases, fishing for particular combinations of species and/or using multiple gear types on a single trip is prohibited.
- ¹⁶ Ex-vessel value data are not available for 1977-1980.
- ¹⁷ Note that crab season straddles the calendar year (December through July), and most landings occur within the first one to two months of the season (Hankin et al. 2001). As a result, activity reported for a given year may not correspond to that of a season, *per se*. We analyzed the data by calendar year for consistency with analyses for other fisheries, most of which have seasons that lie within the calendar year.
- ¹⁸ Initiated by the state in 2004, the CRFS provides comprehensive estimates of effort and catch for all recreational fishing modes, landings and species for each of six multi-county 'districts'. (Modes include: "manmade" structures, beaches and banks, CPFVs or charter boats, and private boats.) The CRFS includes some modified components of NMFS' Marine Recreational Fisheries Statistical Survey (MRFSS), a nationwide recreational catch and effort survey implemented in 1980 (and subsequently replaced by the Marine Recreational Information Program in the mid-2000s), and recreational data collected in CDFG's Ocean Salmon Project (<http://www.dfg.ca.gov/marine/crfs.asp>). See the Regional Profile for a discussion of recreational fishing in the larger North Coast region.
- ¹⁹ The 1980 start date for this analysis is based on the availability of raw electronic CDFG logbook data.
- ²⁰ As of 2007-2008, the Rancheria collected dockage of \$0.09 per pound for use of the pier and crab unloading fees of \$0.17 per pound. Crab unloading fees were increased to \$0.22 per pound as of early 2009. Some fishermen unload their own catch, and pay dockage but not offloading fees.
- ²¹ http://trinidad.ca.gov/minutes/04-23-08_cc_mins.pdf, accessed 7/15/09.
- ²² <http://www.psmfc.org/efin/data/fuel.html#Data>, accessed 11/23/09.
- ²³ In reviewing the draft of this report, one local fisherman noted that the base price increased to \$125 per pot as of September 2009.
- ²⁴ The assessments for other California, Oregon and Washington fisheries are different; see Federal Register (2005) for further information.

Eureka Fishing Community Profile



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EXECUTIVE SUMMARY

Background

National Standard 8 of the Magnuson-Stevens Fishery Conservation and Management Act requires that fishery managers consider the importance of fishery resources to fishing communities, to provide for their sustained participation and to minimize adverse economic impacts on them, consistent with conservation objectives. Similarly, California's Marine Life Management Act mandates the use of socioeconomic as well as biophysical Essential Fishery Information to meet fishery management goals. Information on how individual fisheries and port communities operate is important to meeting these mandates. Yet, such social science information on Northern California port communities has been sparse until recently.

This profile of the Eureka fishing community describes the history of the area and its fisheries, present-day fishery operations, activities and associated infrastructure. It identifies some of the key regulatory and economic factors highlighted by study participants that interact with and affect the local fishing community. It is intended for use in a range of processes, from local planning and education to state and regional management.

The information presented is based on the collection and integrated analysis of archival and field data to interpret patterns, variability and change within and across fisheries and the fishing community over time. Data sources include:

- Commercial fish landing receipt data for 1981–2007 reconfigured into 34 distinct species/gear combinations;

- Commercial Passenger Fishing Vessel (CPFV) logbook data for 1980–2007;
- An extensive review of the published and gray literature, including fishery status reports and historical fishery statistics (as available); and
- Field observation and interviews with about 50 fishery participants and knowledgeable others.

History of the Eureka Fishing Community

Located about 270 miles north of San Francisco, the city of Eureka and surrounding communities have supported commercial and recreational fisheries for well over a century. Eureka is situated on the shore of Humboldt Bay, a 25-square mile coastal estuary that supports a diverse ecosystem as well as fishing, recreation and shipping activities. Once home to the Wiyot peoples, Eureka became a hub for the gold mining and timber industries beginning in 1850, and for fishing shortly thereafter. Commercial fisheries for salmon, groundfish, crab, and shark (mainly for their livers) supported the growth of the industry. By the 1970s, over half of the fish (including shellfish such as oysters) produced and consumed in California were landed in the Humboldt Bay area. Recreational private boat and charter fisheries targeted salmon and other species, further supporting the local economy.

Over the past 30 years, growing concerns about the status of West Coast salmon and groundfish stocks prompted the Pacific Fishery Management Council (PFMC) and the state to implement increasingly stringent management measures for commercial and recreational fisheries. Cumulatively, these measures have discouraged (nontribal) fishing along much of the North Coast, resulting in substantial

reductions in both commercial and recreational fishing activity, and contributing to social and economic impacts in the area.

The Eureka Fishing Community Today

About 100–120 commercial fishing vessels are homeported at Eureka. The resident fleet includes 8–10 trawlers, 15–20 salmon trollers, 5–10 smaller groundfish vessels (sablefish and nearshore species) and about 80 crabbers (including some crabber/trollers), which employ skippers and one to three crew each. Local fish receiving and processing capacity consists of four buyers with receiving stations located at various sites along the Eureka waterfront, including two on-site receiver/processors. Some fish receiving occurs at Fields Landing, located about six miles south of Eureka.

Commercial and/or recreational infrastructure consists of several acres of dock/pier offloading and boat slip facilities, as well as buildings, parking and storage areas, and service facilities (launch ramps, fish cleaning station, work docks, etc.) located at Woodley Island Marina, along the city waterfront, and at Fields Landing. More than 20 Eureka area businesses (and many others outside the area) provide goods and services that directly support both resident and nonresident commercial and recreational fishery operations. The primary berthing facilities are Woodley Island Marina, managed by the Humboldt Bay Harbor, Recreation and Conservation District (Harbor District), and the city-managed Eureka Boat Basin, with limited additional berthing at various docks along the Eureka waterfront, at Fields Landing and at King Salmon. Numerous private vessels and three resident charter operations (and at least two others that move among local ports) make up the recreational fleet.

Commercial Fishing Activity Highlights

Relative to the long term (1981–2007), average annual fishing activity in the Eureka area (Eureka and Fields Landing combined) has declined in recent years (2003–2007) in terms of landings (-14%), ex-vessel value (-13%), boats (-50%), buyers (-2%) and trips (-45%).

- Total landings (all species) ranged from a high of 36.9 million pounds (in 1981) to a low of 9.4 million pounds (in 2001). Annual landings in recent years averaged 16.9 million pounds, down from the long-term average of 19.7 million pounds. This difference reflects a 62% reduction in groundfish landings, partially offset by a 144% increase in whiting landings and a 79% increase in crab landings.
- The ex-vessel value of commercial fishery landings in the Eureka area ranged from a high of \$27 million (in 1981) to a low of \$6.7 million (in 2001), averaging \$13.7 million over the long term and \$11.9 million in recent years.
- The number of boats with landings in the Eureka area ranged from a high of 858 (in 1981) to a low of 118 (in 2005). The annual average for recent years (153 boats) is half that for the long term (306 boats).
- Although the average number of buyers in the long term (41) and recent years (40) is relatively unchanged, fewer fish houses (receiver/processors) operate locally. Of the 30 buyers that received commercially-caught seafood in the Eureka area in 2007, at least five were locally-based (nonfisherman) businesses, at least nine were local fishermen, and seven were buyers based in other locations.

Over the long term, groundfish trawl, crab and albacore (in that order) were the top three fisheries in terms of ex-vessel value. In recent years, crab ranked first, accounting for 57% of ex-vessel revenue, followed by groundfish trawl (24%) and albacore troll (5%).

Trends in average annual ex-vessel price per pound have varied widely among fisheries, with prices higher in recent years compared to the long term in the rockfish (+45%), sablefish (+32%), salmon (+10%) and groundfish trawl (+5%) fisheries, and lower in the whiting (-40%), shrimp trawl (-36%), crab (-12%) and albacore (-5%) fisheries.

The number of ‘Eureka area boats’, defined as those boats that earned a plurality (i.e., the greatest proportion) of their annual ex-vessel revenues from landings in the Eureka area, declined from 439 in 1981 to 88 in 2007. However, the average annual revenue per boat (based on their landings at all ports for all fisheries) increased from less than \$65,000 prior to 1985 to greater than \$100,000 since 2003.

Over the recent decade (1998–2007), revenue concentration has shown no apparent trend, with 34%–47% of boats accounting for 90% of landed value. Revenue concentration among buyers increased, with 9%–17% of buyers accounting for 90% of landed value during the period 2001–2007, compared to 21%–26% during the period 1998–2000.

Recreational Fishing Activity

Eureka has supported extensive ocean recreational fisheries for a variety of species. Although the ocean salmon fishery remains most highly valued by anglers, they increasingly have targeted crab, halibut and albacore, as fishing opportunities for salmon and rockfish have become more limited.

The primary modes of recreational fishing at Eureka are private boat and CPFV, both of which were more active in the 1980s and 1990s than in recent years, according to study participants. While port-specific data on CPFV effort and harvest levels are available (from logbooks), port-specific estimates of private boat effort are not available. Salmon effort and harvest estimates for the ‘Eureka area’ are available from CDFG’s Ocean Salmon Project (OSP); however, these estimates are not specific to Eureka as they also include Trinidad, a separate community 25 miles north.

- Based on CPFV logbook data for all fisheries, charter boat fishing activity at Humboldt Bay ports generally increased from 1981 to 1990, when 12 boats reported 407 boats days and 3,636 angler days.
- CPFV effort dropped sharply in the early 1990s and has remained low, averaging 2 boats, 73 boat trips and 543 angler trips per year between 1991 and 2007.
- Based on OSP data, CPFV activity accounted for 7% of recreational ocean salmon fishing activity in the Eureka area during the period 1981–2007.

Key Factors Affecting Eureka Area Fisheries

Salmon fishery management: The implementation of stringent regulations on (and at times, complete closure of) the commercial salmon fishery by the PFMC – as well as the state’s limited entry program initiated in the early 1980s – led to a sharp decline in activity, and an overall shift of the salmon fishery away from Eureka. Reduced allocations to nontribal fisheries in the early 1990s led to further reductions in fishing opportunities, and sharply curtailed fishery-related economic activity on which many local businesses depended.

Groundfish fishery management:

Increasingly strict federal catch limits since the 1990s, together with the 2003 federal groundfish trawl buyback (in which 14 of 23 Eureka-based vessels participated) and implementation of restricted access in the state's Nearshore Fishery, have curtailed commercial fishery participation. Whereas as many as five receiver/processors handled groundfish (and other species) locally at one time, only one does presently. The loss of local processing capacity has resulted in fewer market options for fishermen, and fewer jobs and economic benefits for the community. The reduction in nearshore fishing opportunities has made it cost-prohibitive for out-of-area buyers to purchase and transport relatively small amounts of fish landed, especially in the live fish fishery.

Economic factors: Rising costs, especially for fuel and insurance, were cited as one of the biggest challenges faced by commercial fishermen (and other community members). At the same time, average price per pound for all fisheries combined is has barely changed between the long term and recent years. Price trends have varied among fisheries – declining in fisheries such as crab and increasing in others such as sablefish. The net effect of these changes and the overall declines in vessel participation and landings on still-active vessels has varied by fishery. Average revenue per boat during the period 2005–2007 was greater compared to the mid-1990s and early 1980s for Eureka-based boats whose primary fishery was groundfish trawl, crab, or albacore but lower for Eureka-based boats whose primary fishery was shrimp trawl, sablefish, salmon or rockfish. It is not clear, however, how these changes in revenue per boat compare to costs, which have likely also increased over time.

Increasing costs and less favorable economic conditions also have affected fishery-support businesses, both directly and indirectly. The reduction in fishing opportunities and activity has reduced demand for goods and services, leading several businesses to cease operations, while others have diversified or shifted emphasis.

Working waterfront: Aging infrastructure, the closure of support businesses such as Eureka Fisheries in 2000 and Eureka Ice and Cold Storage in 2008, and increasingly expensive real estate and permitting requirements, have complicated efforts by fishermen and others to maintain viable operations. Receiving and processing capacity has contracted geographically and become consolidated. Where multiple providers of goods and services (e.g., marine supply, fuel dock, vessel maintenance and repair) once were needed to meet local demand, only one or two of each type remain, serving communities elsewhere along the North Coast as well as Eureka.

While this consolidation suggests increased efficiency, the limited number of goods and service providers makes the local fishing community vulnerable to further regulatory, economic and environmental change. The abrupt closure of Eureka Ice and Cold Storage in 2008 is a reminder of that vulnerability.

The development of the Fishermen's Terminal, a stretch of city waterfront formerly occupied by fish houses, addresses some basic infrastructure needs for local commercial fisheries. Originally conceived in the early 1980s by local fishermen and the city, the project faced spiraling costs and other challenges. However, in 2006 the first phase of the project was completed (providing dock space and hoists), and in late 2009 the city received federal stimulus funds to help with completion of the project. The Fishermen's

Terminal will provide a fish offloading area, seafood market and café, as well as receiving and processing space for two businesses.

Current Situation and Outlook

Eureka area fisheries have changed markedly over the past three decades. Expansion through the 1970s and early 1980s was followed by contraction as regulatory, economic and other factors played out during the 1990s and into the 2000s. Commercial fishery participants (fishermen and buyers alike) have become particularly dependent on crab, although groundfish, albacore and other fisheries continue to play a role. Recreational fisheries have shifted from a primary focus on salmon to albacore, groundfish, halibut and crab, even as salmon fishing remains highly valued.

The fishing community has long been concerned about maintaining Eureka's working waterfront infrastructure, both for the functionality of local fisheries and to preserve the area's maritime heritage. More than 30 years after the idea of a Fishermen's Terminal was conceived to help meet these needs, the project is nearing completion.

At the same time, study participants are concerned about recent and pending events in the larger policy arena including the North Coast Marine Life Protection Act process, begun in late 2009, the individual quota program for the federal groundfish trawl fishery, to be implemented in 2011, and potential offshore energy development, which have the potential to fundamentally change local fisheries and the community.

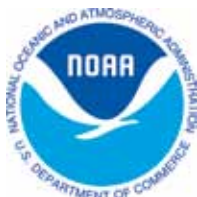
Despite these challenges, the Eureka fishing community is strengthened by the political will of its citizens and leaders, and existing and future infrastructure assets such as two well-maintained harbors, a boatyard and fuel station, and the developing Fishermen's Terminal. These features lend the Eureka fishing community a degree of resilience that may enable it to effectively address the challenges and opportunities that lie ahead.

ACKNOWLEDGEMENTS

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Cover photo by C. Pomeroy.

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INTRODUCTION

The city of Eureka, located 270 miles north of San Francisco, has supported commercial and recreational fisheries for well over a century. Eureka, along with Arcata and several unincorporated communities (Fairhaven, Samoa, Manila, Humboldt Hill, King Salmon, Fields Landing), is situated on the shore of Humboldt Bay (Figure 1), the state's second largest natural coastal estuary.¹ Once home to the Wiyot peoples, Eureka became a hub for the gold mining and timber industries beginning in 1850, and for fishing interests shortly thereafter. By the 1970s, over half of the fish (including cultured shellfish) produced and consumed in California were landed in the Humboldt Bay area (Humboldt County Planning Department 1979).

The only California port north of San Francisco deep enough to allow ocean-going freighters and tankers, the Port of Humboldt serves the shipping industry², commercial and recreational fisheries and other marine users such as aquaculture operations (primarily for oysters). The entrance to Humboldt Bay is notoriously dangerous, and has contributed to many shipwrecks, especially before 1900. A channel-deepening project completed in 2000 significantly improved the entrance; however,

crossing the bar still requires a great deal of caution.

With rich fishing grounds nearby and substantial infrastructure along the waterfront, Eureka continues to be an active fishing port. The City of Eureka, the Humboldt Bay Harbor, Recreation and Conservation District ('Harbor District'), and various private entities own and manage port infrastructure, which occupies approximately 15% of the bay's shoreline (HBHRCD 2007b). Most of this infrastructure is located in the City of Eureka, although some remains at King Salmon and Fields Landing, which used to figure more prominently in local fisheries. Some of the infrastructure dates to the development of the timber industry in the late 1800s, while other infrastructure was built between the 1960s and 1980s specifically to support fishing.

Eureka's commercial fisheries target groundfish (various flatfishes, roundfishes and rockfishes, *Sebastes* spp.), Dungeness crab (*Cancer magister*), Chinook salmon (*Oncorhynchus tshawytscha*),³ albacore tuna (*Thunnus alalunga*), Pacific Whiting

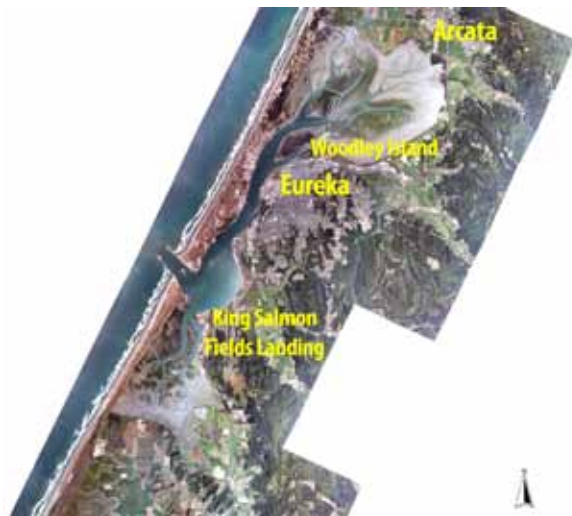


Figure 1. Map of Eureka and Humboldt Bay, California

(*Merluccius productus*) and Pacific Ocean shrimp, or pink shrimp (*Pandalus jordani*). A fishery for Pacific hagfish (*Eptatretus stoutii*) has occurred at times, including in recent years, and there are small-scale fisheries within the bay including those for herring (*Clupea pallasii*, for bait and roe) and northern anchovy (*Engraulis mordax*, for live bait for commercial and recreational tuna fisheries). Recreational fisheries for several species including salmon, rockfish, halibut, sharks and rays, clams and surf perch occur from boats, beach and other manmade structures.⁴ Aquaculture operations have been active in Humboldt Bay since the 1950s.

This profile provides an historic and contemporary description of the Eureka fishing community, focusing on the development of capture fisheries and related infrastructure, with particular emphasis on the period 1981–2007 (for which detailed landings data are available). We describe present-day fishery operations, activities and associated infrastructure, and discuss some of the key regulatory and economic factors highlighted by study participants that interact with and affect the local fishing community.

The information presented here is based on archival and field research conducted between July 2007 and March 2009.⁵ Fieldwork included site visits, informal and formal interviews, and group meetings. These activities engaged approximately 50 people, including 22 local commercial and recreational fishermen, four fish buyers, owners and employees of five fishery-support businesses, Harbor District managers and staff, and City Harbor and Marina Operations staff, as well as other community members who have experience and knowledge of local fisheries. Field data were analyzed together with commercial fishery landings data from the Pacific Fisheries Information Network

(PacFIN) database, recreational fishery data from the California Recreational Fisheries Survey (CRFS) and Commercial Passenger Fishing Vessel (CPFV, or charter) logbooks, and information from other primary and secondary sources, to interpret patterns, variability and change within and across fisheries and the fishing community over time.

History of the Port and the Surrounding Area

The Wiyot Indians, whose presence in the area dates back some 2,000 years, are the first known peoples to have occupied the lands around Humboldt Bay (Planwest Partners 2008). They lived in villages around the bay and along the Eel River, and were sustained by local marine and land resources. At the beginning of the 19th century, Russian-American fur traders were the first nonnative people on record to enter the bay (Scofield 1954), and were followed by an influx of settlers upon discovery of gold in 1849. In the spring of 1850, three European-American groups – the Laura Virginia party, the Union Company, and the Mendocino Company – laid claim to the bay and its surrounding lands (Glatzel 1982). At that time an estimated 1,000 Wiyot Indians lived in the area (Planwest Partners 2008).

Monumental changes occurred in the Humboldt Bay area in the 1850s, as the developing gold mining and timber industries brought thousands of settlers to the area. Four communities were established around the bay: Eureka, Union (later Arcata), Bucksport, and short-lived Humboldt City (today's King Salmon; (Humboldt County Planning Department 1979). In addition to substantially altering the land, the settlers displaced, often by violent means, the local Wiyot peoples. By the late 1860s few, if any, remaining Wiyot people lived freely in the area; most were either killed or moved to reservations (Norman et al. 2007, Planwest Partners 2008).

Eureka became the shipping center for the region, serving gold mining and timber harvesting interests in Trinity and Siskiyou counties (Monroe at el. 1973). By 1854, there were nine sawmills on the bay capable of processing approximately 220,000 board feet of lumber per day (Planwest Partners 2008). By the late 1850s, there were eight mills within the Eureka city limits alone, along with a burgeoning service industry of hotels, saloons, and brothels. By the late 1880s, the bayside commercial district of Eureka was heavily developed: “nearly all of the alphabet streets...ended in a dock, a wharf, a sawmill, a warehouse or a shipyard” (Planwest Partners 2008 p.47). In addition to the burgeoning lumber industry, fishing in the bay for salmon, shark, and shellfish also began to flourish.

History of Eureka Area Fisheries

The Expansion of Local Fisheries

According to Glatzel (1982), the Humboldt Bay fishing industry was started near Fairhaven (on the Samoa Peninsula west of Eureka) by two Finnish fishermen. Scofield (1954) reports that a colony of Chinese fishermen settled at Humboldt Bay in 1857, sending dried fish by steamer to San Francisco markets. The Chinese were later expelled from the area during a wave of anti-immigrant sentiment (Planwest Partners 2008). Also around this time, a shark fishery developed for liver oil; however, the shark population in the bay was diminished within about 10 years, and the fishery lasted only until 1868 (Scofield 1954).⁶

The increase in commercial fishing activity was largely a function of developing land transportation routes. Until the early 20th

century, the only way to get fish from Eureka to San Francisco markets was by sea, which often proved hazardous due to rough seas and the bay’s dangerous entrance (Planwest Partners 2008). Beginning in 1914, the Northwestern Pacific Railroad linked the North Coast with cities further south, facilitating the transport to market of higher volumes of salmon, crab and groundfish (caught mostly in Humboldt Bay at that time).

With the advent of motorized troll vessels in the 1920s, the commercial fishing fleet grew and began to exploit rich fishing grounds outside the bay on the continental shelf. In the late 1920s, the construction of Highway 101 brought tourists in automobiles, including sport fishermen, to the area (Planwest Partners 2008).

According to Scofield (1954), trawlers were active along the North Coast and specifically in the Eureka area by 1929, where they delivered their catch for shipment to larger population centers by rail. Over the next several years, Eureka became a center of trawling activity:

By 1935 it had become customary for most of the San Francisco fleet to fish north of Point Reyes in the summer fair weather (May to October) and make deliveries at Eureka where fish could be shipped out by rail. During the bad weather of the winter months, fishing was mostly south of Point Reyes with deliveries at San Francisco. Gradually boats were spending more and more time at Eureka and fishermen began to look upon that port as their headquarters. Thus in the period, roughly 1935 to 1940, the center of trawling operations shifted from San Francisco to Eureka (p.32).

Eureka Fishing Community Timeline

1850s	Gold rush; settlers occupy Humboldt bay lands previously occupied by the Wiyot Tribe
1856	City of Eureka founded
1857	Chinese fishing colony established; product shipped to San Francisco by steamer
1860	Wiyot village massacres
1870-80s	Railroads and docks built Harbor channel dredged
1889	Humboldt Bay entrance jetties built
1914	Northwest Pacific Railroad links Humboldt Bay to San Francisco
1920s	Eureka Boat Basin established
1927	U.S. Highway 101 built through Eureka
1930s	Seafood plants open in Eureka
1935-40	Trawl fleet arrives from San Francisco Eureka Ice and Cold Storage opens
1940s	Tom Lazio Fish Company, Hallmark Fisheries, Norcal Packing Company fish houses open
1953	Eureka Fisheries opens
1964	Eureka Boat Basin rebuilt
1970	Harbor District established
1973	City builds new seafood processing plant Last timber mill in Eureka closes
1974	Boldt Decision
1976	Magnuson-Stevens Fishery Conservation and Management Act (MSA)
1979	Klamath Management Zone (KMZ) established
1981	Woodley Island Marina opens
1982	Salmon limited entry
1985	KMZ commercial salmon closure
1986	Pacific Choice Seafood opens Eureka plant
1992	Dungeness crab fishery moratorium on entry KMZ recreational salmon fishery limited to 14 days
1993	Salmon re-allocation to tribes (50%) Coho retention prohibited in KMZ commercial fishery
1994	Groundfish limited entry Salmon disaster Coho retention prohibited in KMZ recreational fishery
1995	Dungeness crab limited entry Salmon disaster
1996	Sustainable Fisheries Act (MSA re-authorized)
1998	Marine Life and Nearshore Fishery Management Acts
1999	Marine Life Protection Act (MLPA)
2000	West Coast groundfish disaster Eureka Public Marine opens
2001	Eureka Fisheries closes
2002	Nearshore FMP adopted First federal Rockfish Conservation Area (RCA) established
2003	West Coast groundfish trawl buyback Nearshore fishery restricted access
2006	Klamath salmon disaster
2008	Statewide salmon disaster and fishery closure In-season sport rockfish closure Eureka Ice and Cold Storage closes
2009	Statewide salmon disaster and fishery closure North Coast MLPA process begins

Also around that time many seafood companies (some of which originated in San Francisco) started businesses along the waterfront in Eureka and Fields Landing. These included A. Paladini, Joe Ballestrieri & Company, Hallmark Fisheries, Consolidated Factors and Lazio Fish Company (Anon. 1945). The efforts of these companies in concert with the newly established trawl fleet led to dramatically increased catches of groundfish, particularly Dover sole, which was purchased in large quantities by the U.S. Government to feed soldiers overseas during World War II (Hagerman 1952). The catch of Dover sole steadily increased through the 1940s and by 1950 landings in the Eureka and Fort Bragg areas combined topped 9.5 million pounds.

One of the biggest wholesale fish houses that handled groundfish in the area was Eureka Fisheries, which began operations at Fields Landing in 1953. By 1958 the company

operated three receiving facilities along Humboldt Bay: a headquarters and processing plant in Fields Landing, and two receiving stations in Eureka (at the foot of E and I Streets). The company was able to process more than six million pounds of groundfish annually (Eureka Fisheries 1992). Other West Coast seafood companies such as Meredith, California Shellfish, and Norcal (owned by Eureka Fisheries) also established operations in the Eureka area. Eureka Fisheries also developed receiving and processing plants at Crescent City (1970) and Fort Bragg (1974), as well as wholesale/retail operations in the San Francisco Bay area, positioning itself as a major player in the West Coast seafood industry for many years to come.

Historic landings data compiled from California Fish and Game Bulletins⁷ provide further insight into the variable nature and extent of commercial fishing activity (by species or species group) since 1947 (Figure 2). Between 1947 and 1956,

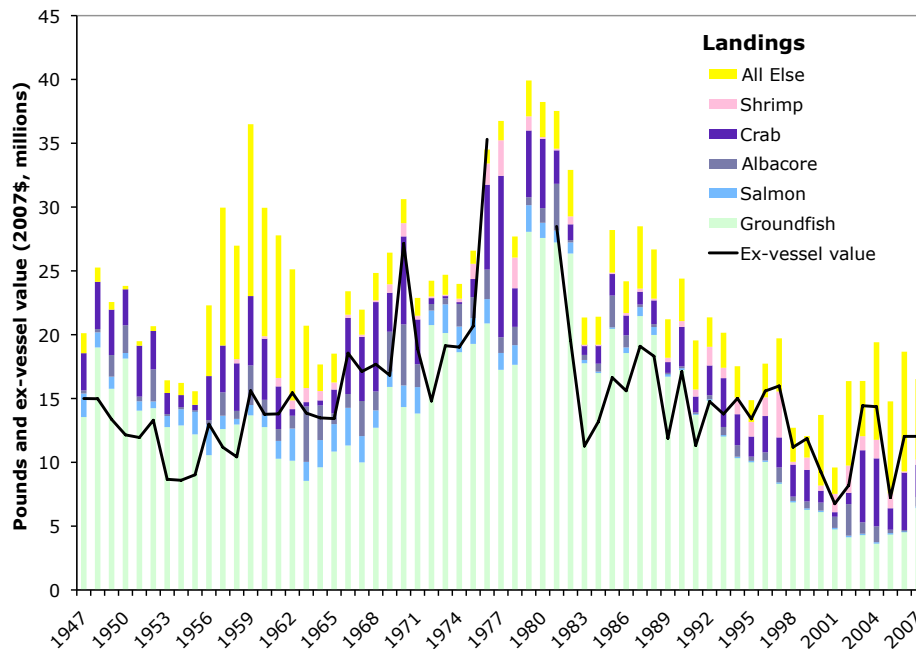


Figure 2. Pounds and ex-vessel value of commercial fishery landings at Eureka and Fields Landing combined, 1947–2007 (CDFG Fish Bulletin Series). Note: Ex-vessel value data for 1977–1980 are not available.

landings and ex-vessel value averaged just over 20 million pounds and about \$12 million (2007\$), respectively, with declines in both measures over the period. Both measures then increased through 1959, with more than 36 million pounds worth more than \$15.6 million landed. Over the next two decades, landings continued to vary, with peaks in 1970, 1976 and 1977, and reaching their highest on record, 39.9 million pounds, in 1979 (ex-vessel value is not available for that year). Landings and value subsequently declined most years, reaching a low of 9.6 million pounds worth \$8.8 million in 2001, before increasing again in recent years. Over this 61-year period, groundfish, salmon and crab together accounted for 63%–97% of ex-vessel value. In most years, groundfish accounted for the majority of landings, peaking at more than 26 million pounds annually between 1979 and 1982. Salmon landings exceeded one million pounds in 26 of 33 years between 1947 and 1980.

Sport fisheries also have played an important role in the Eureka area. According to Miller and Gotshall (1965), more skiffs operated out of Humboldt Bay than any other site between Pt. Arguello and the Oregon border. During the late 1940s, rockfish and miscellaneous flatfish accounted for at least 60% of the catch. After that, the focus shifted to salmon, which accounted for 85%–99% of the catch between 1949 and 1956. Over the next decade, salmon accounted for 62%–91% of the catch, except in 1958, when it accounted for 41%, and rockfish accounted for the balance.

Although pier and shore fishing (including clamming) were popular and some skin diving occurred, skiff fishing was the dominant mode of sport fishing (Monroe et al. 1973). In 1952 there were four party boats and two charter boats operating out of Eureka (Scofield 1954). In 1963, five charter boats, three of which fished commercially during other parts of the year, operated from Humboldt Bay;

90% of their trips occurred between June and September (Monroe et al. 1973). Young (1969) reported a relatively low level of charter activity for 1947–1967, but noted substantial growth in the number of fish caught and number of angler trips through the early 1950s. Activity peaked at more than 5,500 fish in 1953 and more than 2,800 angler trips in 1955. After dropping sharply through 1958, activity increased again to about 1,500 angler trips, and catches of 1,500–2,300 fish per year through the rest of the period.

By the 1970s much of the recreational (and some commercial) fishing was based at King Salmon, a small community about seven miles south of Eureka. At least three privately owned marinas offered berthing, marine supplies, fuel, and RV parking/camping.

From 1960 through 1980, commercial and recreational fishing activity generally increased. Smith (1973) reported that “approximately 450 commercial vessels operate[d] from Humboldt Bay in the mid 1960s with many more using it as a place of refuge during inclement weather” (p.57; see also Monroe et al.1973). With only about 250 slips available then, fishing boats were tied up all along the waterfront, sometimes several deep. Dean et al. (1973, p. 26) characterize the Humboldt Bay commercial fishing fleet at that time: “The vessels are small by commercial standards (generally less than 30 feet) and ... are equipped to fish for at least three species, usually salmon, albacore and crab, with the rest concentrating on groundfish”. Both the larger vessels (primarily trawlers that targeted groundfish and shrimp) and those smaller vessels delivered most of the catch to local fish houses for processing. One exception, albacore, was processed not by Eureka fish buyers; rather it was shipped to canneries in Oregon (Hoopes 1969). The five major seafood companies at that time employed an estimated 1,310 people.⁸

In the early 1970s, commercial fishery infrastructure consisted of six to eight receiving stations, four major fish processing plants and a boat basin along the Eureka waterfront (Monroe et al. 1973, Smith 1973). Study participants reported that there were four gear stores, four fuel docks, and two electronics shops. The two city-owned fish receiving docks were “declared unsafe and in need of complete rebuilding” (Dean et al. 1973 p.26). Meanwhile, the area experienced an increase in sport fishing and other private recreational boat use, for which Dean et al. (1973) characterized the existing mooring facilities as inadequate to meet the growing demand.

In 1967, the Cities of Eureka and Arcata and the Eureka Harbor Commission formed the Humboldt Bay Development Commission to better address the opportunities and challenges facing the Humboldt Bay community regarding fisheries and other uses (Monroe et al. 1973). Legislation to establish the Harbor District was passed in 1970; in 1972 the Harbor District was officially adopted by area citizens (Monroe et al. 1973). By the mid-1970s, improving and expanding fishery-related facilities was recognized as a long-term goal of Humboldt Bay area residents (Humboldt County Overall Economic Development Program Committee 1977, Ray 1982).

Over the next several years, the Harbor District and the city sponsored several studies to characterize current conditions, and identify and evaluate options for development and redevelopment of harbor infrastructure. The recent completion of large infrastructure improvement projects at Crescent City Harbor to the north and Noyo Harbor to the south increased concerns that Eureka’s fisheries and fishing economy would lose out as fishermen, receivers and processors moved to better equipped and maintained ports.

Several sites around the bay were evaluated for the development of a new marina and other fishery-support facilities (Hansel 1978). Ultimately, Woodley Island, located across the channel from the city, was selected as the preferred site, albeit amid some controversy (Life and Times 1977). Construction began in 1978; the 237-slip Woodley Island Marina opened in 1981.

Meanwhile, the Eureka area fishing community benefited from various federal programs aimed at encouraging the development of the nation’s fisheries. The 1971 reauthorization of the Farm Credit Act enabled commercial fishermen to obtain loans through local Production Credit Associations, which had been making such loans to farmers and ranchers since 1933 (Deweese 1976, NOAA 1999). Additionally, the Capital Construction Fund and Fishing Vessel Obligation Guarantee program (authorized by the Federal Ship Financing Act of 1972) offered low interest or government-backed loans, tax-deferred vessel repair and construction programs, fuel tax relief, gear replacement funds, market expansion programs and technical assistance (NOAA 1999). These opportunities helped to substantially increase fleet size and capacity.

The Expansion of Fishery Management

Through the late 1970s, Eureka area fisheries were subject to fairly modest and stable management⁹, and landings were driven largely by resource availability and market demand. With the passage of the Magnuson-Stevens Fishery Conservation and Management Act in 1976, and the creation of the Pacific Fishery Management Council (PFMC), things began to change.

Following development of a Salmon Fishery Management Plan (FMP) in 1977, the PFMC began implementing regulations to protect West Coast salmon runs. In 1979, to better

address concerns regarding fishery impacts on Klamath River fall Chinook, the PFMC established the Klamath Management Zone (KMZ; Pierce 1998), which encompassed Eureka fishermen's primary fishing grounds.¹⁰ In 1982, California adopted a statewide limited entry program for commercial trollers. By 1984, the PFMC had shortened the commercial salmon season in the KMZ to approximately two months, much shorter than the five- to six-month seasons in other areas of the state. This action reflected the PFMC policy of imposing tighter restrictions in areas with greater impacts on Klamath fall Chinook (the KMZ) in lieu of lesser restrictions over a larger geographic area. As a result, commercial salmon seasons in the California portion of the KMZ have at times been only days or weeks in duration, and in some years have been completely closed (e.g., in 1985).¹¹

Beginning in 1992, the PFMC prohibited retention of coho in the commercial salmon fishery south of Cape Falcon, Oregon due to conservation concerns regarding Oregon coastal natural coho (PFMC 1992). This led to fishery disaster declarations for California and Oregon fishing communities in 1994 and 1995, which afforded relief programs for affected communities.¹² Although the KMZ commercial fishery was not nearly as dependent on coho as fisheries further north, the California KMZ was completely closed between 1992 and 1995, largely due to more localized factors that compounded the effects of the coho nonretention policy. In 1993, Klamath fall Chinook was declared overfished (PFMC 1994), and the Department of Interior Solicitor issued an opinion allocating 50% of Klamath-Trinity River salmon to the Yurok and Hoopa tribes. This was significantly higher than the 30% tribal allocation brokered by the Klamath Fishery Management Council in a previous 1987–1991 agreement, and required reduced allocations to nontribal fisheries,

including the KMZ fishery (Pierce 1998).¹³ The cumulative effect of these management actions was to discourage (nontribal) salmon fishing along much of the North Coast, resulting in substantial reductions in both commercial and recreational fishing activity at Eureka, as elsewhere.

In 2006, failure of Klamath fall Chinook to meet its escapement floor for the third consecutive year prompted closure of the commercial salmon fishery in the California KMZ. In 2008 and 2009 the commercial fishery was again closed – this time statewide – due to low escapement of Sacramento River fall Chinook.

Fishing opportunities for West Coast groundfish also have been curtailed by state and federal management. Commercial groundfish landings in Eureka peaked during the early 1980s (see Figure 2). In 1982, the PFMC implemented the West Coast Groundfish FMP and managed the commercial fishery with measures such as harvest guidelines, trip landing and frequency limits, size limits, and gear restrictions. In 1992, the PFMC adopted a harvest rate policy based on the assumption that West Coast groundfish were similar in productivity to other well-studied groundfish stocks. Over the next eight years, as growing scientific evidence indicated that rockfish (*Sebastes* spp.) had productivity rates much lower than other groundfish species, the PFMC adopted increasingly restrictive management measures for rockfishes.¹⁴ However, these measures came too late to reverse the effects of longstanding harvest policies based on inaccurate assumptions, and between 1999 and 2002, eight groundfish stocks were declared overfished.¹⁵ In 2000, a federal disaster was declared in the West Coast groundfish fishery. In order to rebuild overfished stocks, optimum yields (OYs) and trip landing limits for

healthy stocks typically taken with overfished species were cut further for both limited entry and open access vessels. To afford fishery participants more flexibility and enable them to reduce regulatory-induced discards, trip limits were subsequently replaced with cumulative landing limits that gradually expanded in duration (weekly, biweekly, monthly, bimonthly). In 2002 the PFMC implemented rockfish conservation areas (RCAs), which closed a wide swath of continental shelf and slope waters to commercial groundfish fishing from near Cape Mendocino north to the Canadian border. The extreme decline in harvest opportunities exacerbated the problem of excess harvest capacity, leading to measures such as the industry-funded West Coast Groundfish Trawl Buyback program in 2003. In subsequent years, limited entry and open access vessels have been subject to area closures to protect groundfish Essential Fish Habitat and required to carry vessel monitoring systems (VMS).¹⁶

The pink shrimp fishery, active at Eureka since the early 1970s, is largely managed by the state with some federal involvement. Over the years, the fishery has been subject to federal regulations including finfish excluder devices to minimize groundfish bycatch (2002), area closures to protect groundfish EFH (2006), and VMS (2007). In addition, vessels are subject to state management including limited entry (for vessels north of Point Conception), a November-March closure (to protect egg-bearing females), and maximum count-per-pound and minimum mesh size regulations (to protect juvenile shrimp; CDFG 2007). Prior to 2008, shrimp trawling was allowed in state waters two to three miles from shore between Point Reyes and False Cape; since then, ocean shrimp trawl grounds in state waters have been closed.¹⁷ Of the 85 pink shrimp permits retired by the 2003 groundfish trawl buyback (which required vessels bought out of the groundfish

fishery to retire all of their permits for West Coast fisheries), 31 were linked to California vessels (CDFG 2007).

State management of the groundfish fishery also unfolded during this time. The passage of the Nearshore Fishery Management Act (within the state's Marine Life Management Act) in 1998 established minimum size limits for 10 commonly caught nearshore species, and mandated the development of a Nearshore FMP. In 2001, the nearshore rockfish fishery was closed outside 20 fathoms from March through June. Two years later, the state implemented the FMP, which specified management measures for 19 nearshore species including gear and seasonal restrictions, as well as a restricted access program to achieve the statewide capacity goal of 61 participants (down from 1,128 in 1999). Of the 215 transferable permits issued in 2003, 29 (13.5%) were allocated to the North Coast (Cape Mendocino north to the Oregon border).¹⁸

The Dungeness crab fishery, long an important fishery for Eureka-based operations, has not undergone the significant management changes that have occurred in the salmon and groundfish fisheries. In managing the fishery, the state has used the "three S" (sex, size, season) strategy that includes male-only harvest (since 1897), a minimum size limit (since 1911) and a limited season (since 1957). In 1992, a moratorium on entry was established, and a restricted access program was implemented in 1995. The Northern California crab season usually runs from December 1 through July 15, although its start has been delayed in some years because of price disputes, or to insure that male crabs have completed molting, as occurred in 2005. In 2009, the state convened a Dungeness Crab Task Force in response to concerns about recent increases in participation and gear usage. Following the recommendation of the

Task Force (California Dungeness Crab Task Force 2010), a bill that would establish a pilot crab pot allocation program to address those concerns (SB 1039, Wiggins) is pending in the State Legislature.

Recreational fisheries at Eureka, which primarily targeted salmon, similarly have been affected by KMZ restrictions related to management of Klamath River fall Chinook, tribal allocation changes, and rebuilding requirements for overfished rockfishes (which include a number of recreationally important species). However, the KMZ recreational fishery has generally been less constrained than the commercial fishery (though more constrained than the recreational fishery elsewhere in the state). In 1986, the season in the California KMZ was reduced from about nine to five months. Since then, seasons in the California KMZ have generally ranged from one to six months, with several notable exceptions (i.e., the 14-, 0-, and 10-day openings in 1992, 2008, and 2009 respectively) This is in contrast to other parts of the state, where the recreational season generally extended for six to nine months through 2007 (PFMC 2009). While the KMZ recreational fishery is much reduced from the peak periods of the 1970s and 1980s, it remains an active fishery that attracts both resident and nonresident anglers, at least in those years when recreational opportunity is available.

The recreational groundfish fishery has been increasingly constrained since the late 1990s to address concerns regarding depleted or overfished groundfish stocks. Measures have included bag limit reductions first implemented in 1998, inseason closures since 2001, and depth-based closures starting in 2004. In 2008, the once year-round season was compressed to four months. In 2008, California Department of Fish and Game (CDFG) considered establishing yelloweye RCAs in addition to

existing depth-based closures, but ultimately did not implement them. Instead, the nearshore recreational groundfish fishery was closed four months early.

A Brief History of Humboldt Bay Aquaculture

The Humboldt Bay oyster and bivalve seed industry had a rough start, but is now a solidly established sector in the area. Beginning in 1910, several attempts were made to expand native oyster (*Ostrea lurida*) beds in the bay, and to introduce eastern oysters (*Crassostrea virginica*), which had flourished since their introduction in San Francisco Bay in the 1880s (Conte 1996). Unfavorable conditions and an abundance of predators hastened the failure of both the Eureka and Morgan Oyster Companies (Barrett 1963). When oyster production plummeted in San Francisco Bay in the early 1900s (mainly due to pollution), oyster growers began looking for suitable alternative sites.

In 1929, the CDFG, in collaboration with oyster companies, successfully introduced the Japanese Pacific oyster (*Crassostrea gigas*) into California waters (Conte 1996). However, this species was not introduced into Humboldt Bay at the time because biologists were trying to reestablish native populations there. As soon as the state Fish and Game Commission lifted the restriction on Pacific oysters in Humboldt Bay in 1953, Coast Oyster Company (now Coast Seafoods) and others established operations there.



Between 1956 and 1965, average annual production of Pacific oysters in Humboldt Bay was just over 7.6 million pounds worth \$179,376 (roughly \$1 million in 2007\$; Gotshall 1966). Nearly 700,000 pounds of Pacific oyster meat was produced in 1971, representing approximately 70% of California’s oyster production that year (Monroe et al. 1973). Oysters were primarily bottom-cultured until environmental concerns led to the adoption of off-bottom long lines and ‘French style’ rack-and-bag techniques beginning in the 1980s.¹⁹

Variability in production has been a function of water quality and conditions in the bay, the supply of seed oysters from other areas, and market demand (Barrett 1963, Monroe et al. 1973). According to one long-time shellfish grower, Humboldt Bay is the primary source for bivalve seed to other California farms and is a key supplier of manila clams and Pacific and Kumamoto Oyster seed to Washington.

Ocean acidification and *Vibrio tubiashii* blooms have challenged seed and larvae producers in recent years, and demand for seed

and market shellstock oysters from Humboldt Bay consistently exceeds supply.

In 2004, more than 600,000 pounds of oysters were harvested from Humboldt Bay (Prosperity Network 2007), the majority by Coast Seafoods, the largest producer in Humboldt Bay.²⁰ Five businesses currently produce oysters and/or oyster seed (primarily for Pacific oyster, *Crassostrea gigas*) and Manila clams (*Venerupis philippinarum*), largely in Northern Humboldt Bay (Table 1). In 2009, Taylor Mariculture LLC purchased Kuiper Mariculture, and continues to expand Humboldt Bay’s role in supply of bivalve seed to farms domestically and overseas. North Bay Oyster Company operates an off-bottom shellstock oyster company on tidelands leased from the City of Arcata and has two tenant farms, Humboldt Bay Oyster Company and Aqua Rodeo Farms, which also culture oysters. In addition, Humboldt Bay Oyster Company produces large oyster seed for other California and Washington farms (Kuiper 2009). Annual gross sales of these operations combined currently average more than \$6 million (Kuiper 2009).

Table 1. Current aquaculture facilities in the Humboldt Bay area.

Business Name	Product(s)	Employees
Aqua Rodeo Farms	Pacific and Kumamoto oysters	1 FT
Coast Seafoods	Pacific and Kumamoto oysters, Manila clams	30–40
Humboldt Bay Oyster Co.	Oysters and oyster seed	2FT, 1PT
Kuiper Mariculture*	Pacific and Kumamoto oyster seed, Manila clam seed	6FT, 2 PT
North Bay Shellfish	Market oyster, mussels	1FT, 1PT

* In 2009, Washington-based Taylor Mariculture LLC purchased Kuiper Mariculture.

THE EUREKA FISHING COMMUNITY TODAY

The Eureka fishing community is comprised of commercial and recreational fishery participants (e.g., fishermen, receivers, processors) and their families, as well as fishery-support businesses that provide goods and services that fishery participants need to operate safely and effectively. Local commercial fisheries include a diversity of participants engaged in a range of fisheries and fishery-related activities. Recreational fisheries include private boat and charter operations that involve locals and nonlocals alike.



Commercial Fisheries

The primary commercial fisheries at Eureka include the pot fishery for Dungeness crab, and the trawl, hook-and-line and trap fisheries for various groundfish species.²¹ The salmon troll fishery, when regulations permit, is also active. Other current fisheries include the trawl fisheries for pink shrimp and Pacific whiting²², the troll fishery for albacore tuna, and the hook-and-line (longline) fishery for sablefish (blackcod, *Anaploma fimbria*), and a small and variably active bucket (or Korean trap) fishery for Pacific hagfish (slime eel, *Eptatretus stoutii*).²³ Within Humboldt Bay, there are also small-scale gillnet fisheries for herring and northern anchovy.

Most of these fisheries are seasonal as a function of resource availability, regulations that define when, where and how each fishery is allowed to operate, the availability of buyers, and market demand (Table 2). However, the actual temporal distribution of activity is often more compressed, variable and complex than suggested by the table. For instance, the availability of albacore varies widely from year to year. The salmon fishery in California’s KMZ was completely closed in 2006, 2008 and 2009, and opened only briefly in 2007. The Dungeness crab fishery is concentrated in the winter months due to peak holiday demand. Groundfish seasons tend to be defined in two-month increments (reflecting the use of bimonthly vessel cumulative landing limits), vary by species and fishery sector, and are sometimes subject to inseason closure to prevent optimum yield (OY) of selected species from being exceeded.

Table 2. Seasonality of selected commercial fisheries at Eureka.

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC
Albacore												
Crab												
Groundfish												
Pink shrimp												
Salmon												
Whiting												

About 100–120 commercial fishing vessels are homeported at Eureka. Commercial fishery participants described the make-up of the resident fleet as including 8–10 trawlers, 15–20 salmon trollers, 5–10 smaller groundfish vessels (which target sablefish and nearshore species) and about 80 crabbers (or combination crabber/trollers). Although some fishermen in these groups are specialized, most participate in multiple fisheries. Some are full-time, while others are part-time fishermen. Full-time skippers depend on fishing for their livelihood and fish year-round, as resource availability, weather and regulations permit. Part-time skippers fish part of the year, often focusing on a single fishery, and may pursue other activities (on or off the water) as part of their livelihood.

Vessels are characterized as either ‘big boats’ (55 feet long or larger) or ‘small boats’ (less than 55 feet). Big boats include trawlers and larger crabber/trollers. These vessels may also be called ‘trip-boats’, as they are equipped with comfort and safety features that enable them to venture as far south as the San Francisco Bay area, north into Oregon and Washington, and further offshore for a few days to several weeks to follow the fish. Small boats tend to fish for some combination of crab, groundfish (including sablefish), and perhaps salmon. These smaller vessels may make short trips (up to five days), but often work as ‘day-boats’, leaving port early in the morning to fish nearby, then returning to Eureka the same day to unload their catch. Larger boats may carry two to four crew (including the skipper), while smaller operations may carry a crew of one to three.

The frequency and duration of fishing trips varies within and among fisheries. Most of Eureka’s hook-and-line groundfish fishing operations work as day-boats, while most groundfish, shrimp and whiting trawlers are trip-boats. For the crab fishery, small and big

boats alike usually make day trips for the local fishery. However, some travel to the San Francisco Bay area for the mid- November opening of the fishery in that region. Those trollers that travel for salmon generally leave Eureka for part of the season, making three- to five-day fishing trips in areas that are open to salmon fishing, and delivering their catch to buyers at ports in those areas.

A number of transient vessels also use Humboldt Bay’s fishery support infrastructure. Vessels such as those from the offshore tuna fleet periodically visit the port to offload fish and/or re-provision, and some receivers have arrangements with nonresident vessels (especially whiting vessels) to deliver at Eureka. According to Eureka Public Marina staff, on average 15% of berths are used by transient vessels (combination of commercial and recreational). In addition, vessels from Trinidad (25 miles to the north) move their boats to Eureka for refuge when marine conditions are severe.

Eureka Area Seafood Receiving, Processing and Marketing

Presently, local fish receiving and processing capacity consists of four buyers with receiving stations located at various sites along the Eureka waterfront, including two on-site receiver/processors. Pacific Choice Seafood, the larger of these, processes a wide range of species landed at Eureka and other Northern



California ports and currently is the only pink shrimp processor in the region. Caito Fisheries processes some crab locally, and trucks the remainder of the catch as well as groundfish to its plant in Fort Bragg for processing. These two firms, together with Carvalho Fisheries, accounted for more than 90% of the ex-vessel value of the catch at Eureka and Fields Landing in 2005 and 2006, and 82% in 2007. The fourth receiver, Humboldt Seafood Unloaders, offloads for other nonresident seafood buyers.

The chain of custody generally follows from fishing vessel to receiver to processors, with most of the catch transported out of Eureka for distribution (Figure 3). Some buyers receive fish on behalf of other entities based elsewhere along the West Coast as well as their own business. In 2007, at least 15 (37%) of the 41 entities that received fish at Eureka, including fishermen who sold their own and

in some cases others' catch, were based in the area. Some businesses are vertically integrated and function in multiple roles (e.g., receiver and distributor). Some local buyers sell crab, salmon and groundfish directly to the public through retail outlets and/or online sales. In addition, at least three local groceries sell locally landed seafood. Between 6 and 12 fishermen engage in off-the-boat sales for albacore, some crab and some other finfish species.²⁴

Product forms vary within and across fisheries (Table 3). Pacific whiting, groundfish, salmon, shrimp and crab are processed locally. Live crab has become more common over the past decade, largely due to growing demand in the San Francisco Bay area. Some albacore and salmon are processed on a small scale elsewhere in the Eureka area for local and regional distribution.

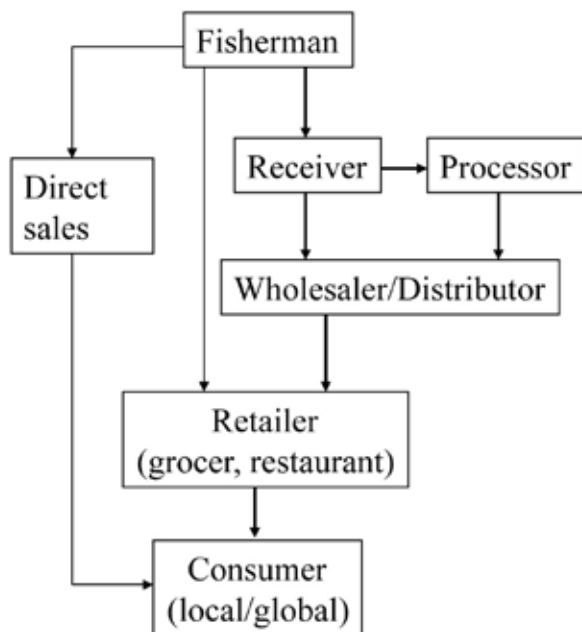


Figure 3. Pathways of seafood landed at Eureka.
Note: thicker arrows indicate most common pathways.



Ocean Recreational Fisheries

Recreational fishing in Humboldt Bay and the ocean is done mainly from private boats; additionally, at least three charter operations serve resident and nonresident anglers. A reported 50%–70% of charter operators' clients are residents or friends and family of residents. The remaining 30%–50% visit from outside the area, and thus support local hotels, campgrounds and restaurants during their stay.

Table 3. Product forms, processing location and destination of seafood landed at Eureka.

	Product forms	Processing location	Markets
Albacore	Whole, filet, canned	Eureka, Other California and West Coast locations	Local to overseas
Crab	Cooked whole & sectioned, picked, live	Eureka, Other West Coast locations	Local to nationwide
Groundfish	Whole, filet, live	Eureka, Fort Bragg, Other West Coast	Local to overseas
Pink shrimp	Picked and canned, frozen	Eureka	State to nationwide
Salmon	Whole, filet, steak	Eureka, Fort Bragg, Other West Coast	Local to nationwide
Whiting	Filet, head/gut, surimi	Eureka, Other West Coast	Overseas

The most avid anglers pursue an annual round of fisheries that includes salmon (when the season is open), crab in winter, California and/or Pacific halibut in the summer, albacore in late summer, and rockfish from late spring to year-end (subject to closure when OYs have been reached; Table 4). Actual activity is often more compressed and variable than indicated in the table. For instance, the availability of albacore to recreational anglers varies widely from year to year. The salmon fishery in California’s KMZ is open only for a subset of days in some months in order to extend the length of the season; the fishery was completely closed in 2008 and limited to 10 days in 2009. In recent years, the groundfish fishery, which was open year-round through the early 2000s, has not opened until May and has been subject to late-season closure to prevent OYs of selected species from being exceeded.

Harbor Infrastructure and Fishery-Support Businesses

Most infrastructure used by Eureka’s fishing community is located along the city waterfront and at Woodley Island Marina, with additional infrastructure at Fields Landing and King Salmon in the South Bay. Each of these four sites – Fields Landing, King Salmon, the Eureka waterfront, and Woodley Island Marina – has played a unique role in the development of local fisheries. According to Monroe et al. (1973) before Woodley Island Marina was built, Fields Landing served primarily as a ship reconditioning and fish offloading site. King Salmon, developed as “King Salmon resort, a recreational subdivision” by owners Eureka Shipbuilders, Inc. in 1948, once provided 110 private berths for private recreational and charter fishing operations and limited other services (Monroe et al. 1973, Tuttle 1982). The Eureka Boat Basin, used initially by

Table 4. Seasonality of major recreational fisheries at Eureka.

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC
Albacore												
Crab												
Groundfish												
Salmon												
Halibut												

commercial fishermen in the 1920s and 1930s, provided public facilities, including 138 berths as of the early 1970s (Monroe et al. 1973).

Commercial and recreational fishery-support infrastructure consists of several acres of dock/pier offloading and boat slip facilities, as well as buildings, parking and storage areas, service facilities (e.g., launch ramps, fish cleaning station), and equipment such as hoists (Table 5). The Harbor District also operates the Fields Landing Boat Yard, a self-service haul-out and boat launching facility with a Travelift

for vessels less than 150 tons (HBHRCD 2007b). Woodley Island Marina and the Eureka Boat Basin provide the primary berthing facilities, with limited additional berthing at various docks along the Eureka waterfront, and at Fields Landing and King Salmon. Fish receiving and offloading facilities are all located on the Eureka and Fields Landing waterfronts. Most commercial fishermen tie up at one of the two marinas; recreational fishermen use marina berths or launch their boats from one of four launch ramps located around the bay.

Table 5. Major Eureka area ocean fisheries infrastructure.

Location	Facilities	Owner/Operator(s)	Services
Eureka Area	Woodley Island Marina	Harbor District/same	Berthing (237 slips), utilities, work area, storage
	K Street Dock	City of Eureka/Caito Fisheries	Offloading, tie-ups
	Fishermen’s Terminal (foot of C Street)	City of Eureka/same	420 ft ² dock, 1 jib hoist, 3 fish hoists, work area
Eureka Area (continued)	Commercial St. Dock	City of Eureka/Pacific Choice Seafoods, Englund Marine	Offloading, fuel, marine supply, tie-ups
	Eureka Boat Basin	City of Eureka/same	Berthing (158 slips + side ties), utilities, launch ramp, storage
	Dock B*	City of Eureka/ Carvalho Fisheries, Humboldt Seafood Unloaders	Offloading, tie-ups
	Fishing Pier (Del Norte Street)	City of Eureka	Fishing pier
King Salmon	Johnny’s Marina & RV	Privately owned	~ 50 slips, utilities, fuel, bait, RV park
Fields Landing	E-Z Landing	Privately owned	
	Boat Repair Yard	Harbor District/same	Boat repair
North Spit	Boat Launch Ramp	Humboldt County/same	Boat launching
	Boat Launch	Humboldt County/same	Launching
Other	Schneider Dock	City of Eureka/ Pacific Affiliates	Unknown
	Samoa Bridge Boat Launch ramp	Humboldt County/same	Boat launching

*Removed from use in January 2010.

Both resident and nonresident fishery participants utilize this infrastructure, as well as the goods and services provided by local and regional fishery-support businesses. More than 20 Eureka area businesses provide goods and services that directly support commercial and recreational fishing activities not only locally, but throughout the region (Table 6 and Table 7). Although specific needs vary by fishery and fishing operation, the waterfront businesses most commonly used by commercial fishermen include receivers/processors, marine repair and supply services, the fuel dock and the ice plant and cold storage facility. (The ice and cold storage facility closed in September 2008. A new ice plant, built by the City of Eureka, began operations in early 2010; however, no cold storage facilities are available.) Bait is available through local fish buyers and from sources outside Eureka,

and a local fisherman provides live bait to both recreational fishermen and the commercial tuna fleet (including vessels based elsewhere along the West Coast) for albacore fishing.²⁵ Recreational fishermen also utilize the marinas, marine supply stores and fuel dock, as well as restaurants and grocery stores located in town.

Fishing Organizations

Three commercial fishing associations are active at Eureka. The Fishermen’s Marketing Association (FMA), based in McKinleyville, California, was established in 1952 by a group of Eureka-based groundfish trawl fishermen to address marketing issues with fish buyers and, in later years, management issues. In the late 1980s, the organization expanded to include shrimp trawlers and groundfish trawlers from other areas. As of late 2007, about eight of the FMA’s 58 member boats were homeported in Eureka.²⁶

Table 6. Eureka area user groups, infrastructure and services, as of July 2008.

User groups	Harbor District, City or privately owned infrastructure	Harbor services	Resident business types
Commercial fishing	Boat basins (slips)	Bathrooms/shower and laundry	Aquaculture operations (5)
Commercial shipping†	- Woodley Island (237)		
Commercial aquaculture	- City of Eureka (134)	Bilge & sewage pump-out station	Bait/tackle shops (2)
	- Johnny’s Marina (50)		Boatyard/drydock (2)
	- EZ Landing (30)		
Community residents	Fuel dock (1)	Dredging/maintenance of harbor channel	Commercial divers (unknown)
Recreational fishing (charter, private boat, shore-based)	Launch ramps (4)	Dry storage	Electronics service (1)
Resident businesses	Offloading infrastructure	Fuel, water, power	Fish processors (2)
	- city docks (4)		
	- Woodley island hoist	Oil recycling station	Fish receivers (4)
Tourists	(1 for work only, no offloading)	Waste disposal and recycling	Ice plant/cold storage (0)*
	- receiving stations (4)	Visitor berthing	Live bait provider (1)
	Other infrastructure		Marine supplies (3)
	- work dock		
	- transient dock		
	- boat yard		
	- fishing pier		
	Parking and storage areas		

* Eureka Ice & Cold Storage ceased operations in September 2008.

† Infrastructure specific to shipping is not considered in this report.

Table 7. Local support businesses used by Eureka fishery participants. Note: Blank space in number of employees column = unknown.

Business Type	Business Name	Number of Employees
Boat building/repair	Cloudburst Fishing Co. David Peterson (wood boats) John Gahn (steel boats/welding)** Fabcast	1 FT
Charter operations	Celtic Charters, F/V <i>Shellback</i> Full Throttle Sportfishing, F/V <i>Seaweasel</i> <i>Reel Steel</i> Sportfishing, F/V <i>Reel Steel</i>	1 1 2
Cold storage	Eureka Ice & Cold Storage*** Eureka Wholesale Meats****	
Commercial diver	Pro Sport Center	
Fish receivers/buyers	Caito Fisheries Carvalho Fisheries/Wild Planet Humboldt Seafood Unloaders Pacific Choice Seafoods	3 FT, 4–5 PT, up to 80 seasonal 16 FT 6 FT/PT 120 FT, up to 200 seasonal
Fuel	EZ Landing (King Salmon) Englund Marine (for Renner Petroleum)	
Ice facility	Eureka Ice & Cold Storage***	
Live bait	Ken Bates	
Marine electrical	Fred's Marine Industrial Electric (Arcata)	
Marine hydraulics	East Bay Hydraulics Trinity Diesel	
Marine refrigeration	Town & Country	
Marine repair	Fields Landing Boatyard	(see Port Management)
Marine supply	Englund Marine Supply Bucksport Sporting Goods Custom Crab Pots Commercial Crab Pots Quality Crab Pots Redwood Marine Mad River Outfitters (Arcata) Outboard Center (Arcata)*	4 FT
Motels and RV parks	Various	
Port management	Harbor District (Woodley Island Marina and Boatyard) City of Eureka (Public Marina)	14 FT 4 FT
Processors	Pacific Choice Seafoods	see Fish receivers/buyers
Restaurants/grocers	Various	
Retail fish market	Mr. Fish Botchie's Crab Stand Lazio's Seafood Store	
Weather information	NOAA Weather Service	
Welding services/ supplies	Eureka Oxygen	

* Closed as of Spring 2010.

** Left area 2009; business operated by new owner as 'Gone Welding'.

*** Closed September 2008.

**** Used by some Eureka fishermen for cold storage (e.g., for bait), until it burned down in late 2006.

The Western Fishboat Owners' Association (WFOA), established in 1970 and based in Redding, California, represents an estimated 400 albacore trollers and support businesses from British Columbia to Southern California, Hawaii and New Zealand. About 15 of its members are homeported in the Eureka area.²⁷ The WFOA focuses its efforts on marketing and product pricing for the boats, and represents its members in fishery management issues at the state, federal, and international level.

The Humboldt Fishermen's Marketing Association (HFMA), established in 1955, primarily represents salmon trollers and crabbers in the Humboldt Bay area. It has long worked with the city, the Harbor District and the community to address local infrastructure needs and other topics, and with state and federal legislators and agencies to address issues of concern, most notably salmon management.

The Fishermen's Wives Association was active for several decades, providing a variety of fishing community support functions.²⁸ For example, in 1979, it commissioned the fishermen's memorial at Woodley Island Marina (Trauth 2001). More recently, women associated with Eureka's commercial fisheries

have been active in Humboldt Women for Commercial Fisheries, a countywide organization. Among other activities, the group has developed a "Humboldt Wild Seafood" campaign to promote local seafood sales.

Two local sport fishing organizations are active in the Humboldt Bay area. The Humboldt Tuna Club (or Bay Area Tuna Club) represents local sport fishermen, most of whom are based in the Eureka area. Although albacore fishing is the organization's central focus, most of its members are active in other fisheries year-round. The group has a strong social network, and engages in a variety of fishery-related and community activities. In early 2009, Humboldt Tuna Club members and others established Humboldt Area Saltwater Anglers (HASA) to educate members and the public about local sport fisheries, and address a range of issues, including salmon and rockfish management and the Marine Life Protection Act Initiative process. HASA represents about 300 North Coast recreational fishermen.

The Arcata Bay Oyster Festival, organized by Humboldt Bay oyster growers and others, and held annually in June since 1991, celebrates the long history of the local oyster industry. The annual one-day event attracts tourists and residents, promotes aquaculture in Humboldt Bay, and generates revenue for the city.

COMMERCIAL FISHERY ACTIVITY IN THE EUREKA AREA

This section focuses on commercial fishery activity in Eureka and Fields Landing *combined* (hereafter termed the ‘Eureka area’) between 1981 and 2007.²⁹ The information presented is based on customized summaries of Pacific Fisheries Information Network (PacFIN) landings receipt data, augmented by earlier and/or longer-term data, as well as data from fieldwork. Eureka and Fields Landing (the area’s primary offloading sites) are combined in this analysis to enable more complete reporting of fishery activity while meeting confidentiality requirements, and because the two locations are closely linked in terms of their fisheries and participants.

We use five measures of fishing activity derived from the landings receipt data. Landings are reported as ‘round weight’ (in pounds), reflecting the total weight of the fish caught. (For species like salmon and sablefish, which are gutted at sea, landed weights are converted to round weights to provide comparability with other species.) Ex-vessel values represent the amount paid to fishermen at the first point of sale (usually to a dockside buyer or receiver). Prices are calculated as the total ex-vessel value divided by total pounds landed. Both ex-vessel values and prices are adjusted for inflation using US\$ 2007 values as a base. Boat counts represent individual (resident and nonresident) fishing operations, though not necessarily individual fishermen, as some fishermen may own and/or operate multiple boats, and most boats have crew (and possibly multiple skippers) that these counts do not include. Buyer counts are based on the number of unique buyer IDs in the landings data, and include fishermen who land their own catch (e.g., for off-the-boat sales, direct sales to restaurants) as well as receivers, fish houses and other types of fish buyers who purchase

the catch from fishermen delivering at the docks.³⁰ The number of trips provides a count of the deliveries each boat makes at the port.³¹ To insure confidentiality, data are not reported for some fisheries and/or years if fewer than three vessels or buyers participated.

In the discussion that follows, the *long term* is the period 1981–2007, whereas *recent years* pertains to the most recent five years of the time series (2003–2007), unless otherwise noted. The purpose of focusing on these two time periods is to demonstrate how recent activity compares to longer-term historical levels. While the long-term trends described in this section begin in 1981, it should be noted that some local fisheries (e.g., groundfish, salmon) were established well before that year.

Overall fishing activity in the Eureka area has declined since 1981. Several fisheries – most notably groundfish trawl and crab – have been major contributors, as measured by pounds landed, ex-vessel value, number of boats, buyers and trips. Total landings (all species) ranged between a high of 36.9 million pounds (in 1981) and a low of about 9.4 million pounds (in 2001) (Figure 4, Table 8). Average annual landings were 14% lower in recent years (16.9 million pounds) relative to the long-term average (19.7 million pounds). This difference reflects a 62% reduction in groundfish landings, partially offset by a 144% increase in whiting landings and a 79% increase in crab landings between the long term and recent years.

The ex-vessel value of commercial fishery landings in the Eureka area ranged from a high of \$27 million (in 1981) to a low of \$6.7 million (in 2001), averaging \$13.7 million over the long term and \$11.9 million in recent

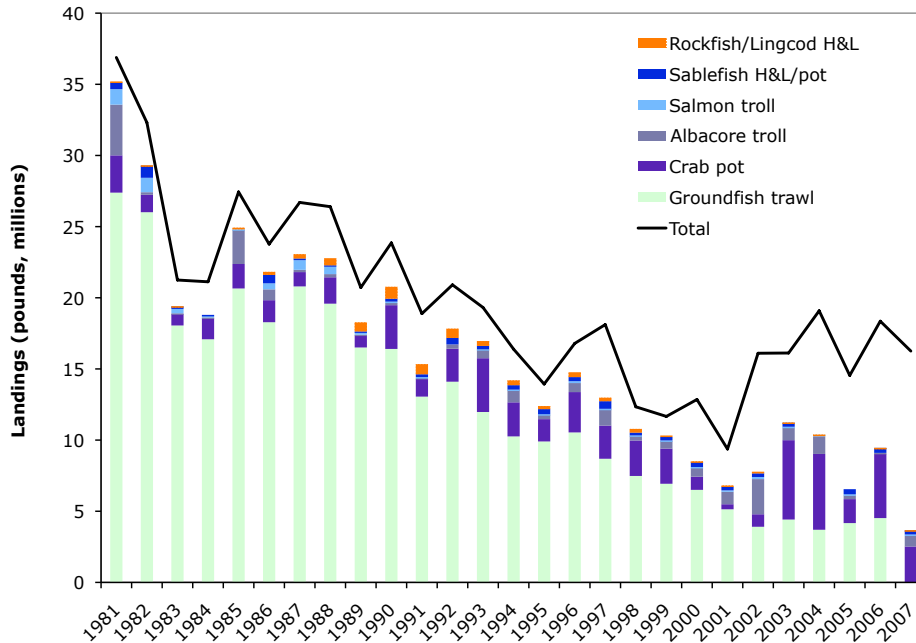


Figure 4. Commercial fishery landings (millions of pounds) in the Eureka area for selected fisheries and overall, 1981–2007. Note: Activity cannot be reported for the individual fisheries when more than zero but fewer than three boats or buyers participated (i.e., rockfish/lingcod hook-and-line in 1984 and 2005, sablefish in 1985 and 2004, salmon in 1992, groundfish trawl in 2007).

Table 8. Long-term and recent annual average, percent difference, and highs and lows in selected measures for commercial fisheries in the Eureka area, 1981–2007.

	Long-term average (1981–2007)	Recent average (2003–2007)	Percent difference	High year(s) (amount)	Low year(s) (amount)
Landings (lbs)	19,684,745	16,871,930	-14	1981 (36,885,297)	2001 (9,370,903)
Ex-vessel value (\$)	13,679,893	11,911,165	-13	1981 (26,972,814)	2001 (6,661,437)
Boats	306	153	-50	1981 (858)	2005 (118)
Buyers	41	40	-2	2001 (68)	1985 (24)
Trips	4,024	2,211	-45	1981 (9,512)	2005 (1,530)
Price (\$/lb)	0.71	0.70	-1	1999 (1.00)	2005 (0.49)

years (Table 8, Figure 5). Over the long term, groundfish trawl, crab and albacore (in that order) were the top three fisheries in terms of ex-vessel value. In recent years, crab has ranked first (accounting for 57% of ex-vessel revenue), followed by groundfish trawl (24%) and albacore (5%).

The number of boats with landings in the Eureka area ranged from a high of 858 (in 1981) to a low of 118 (in 2005). The annual average for recent years (153 boats) is half that for the long term (306 boats; Figure 6). Most of this change is due to the substantial decline in the number of salmon trollers, reflecting reduced fishing opportunities in the California KMZ and implementation of a statewide troll

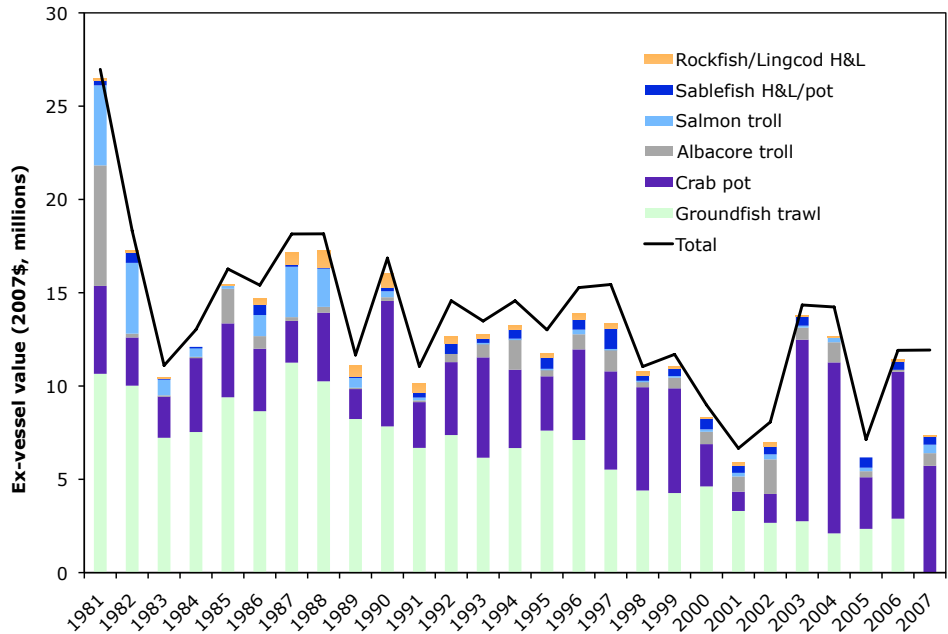


Figure 5. Ex-vessel value (2007\$) of commercial fishery landings in the Eureka area for selected fisheries and overall, 1981–2007. Note: Activity cannot be reported for the individual fisheries when more than zero but fewer than three boats or buyers participated (i.e., rockfish/lingcod hook-and-line in 1984 and 2005, sablefish in 1985 and 2004, salmon in 1992, groundfish trawl in 2007).

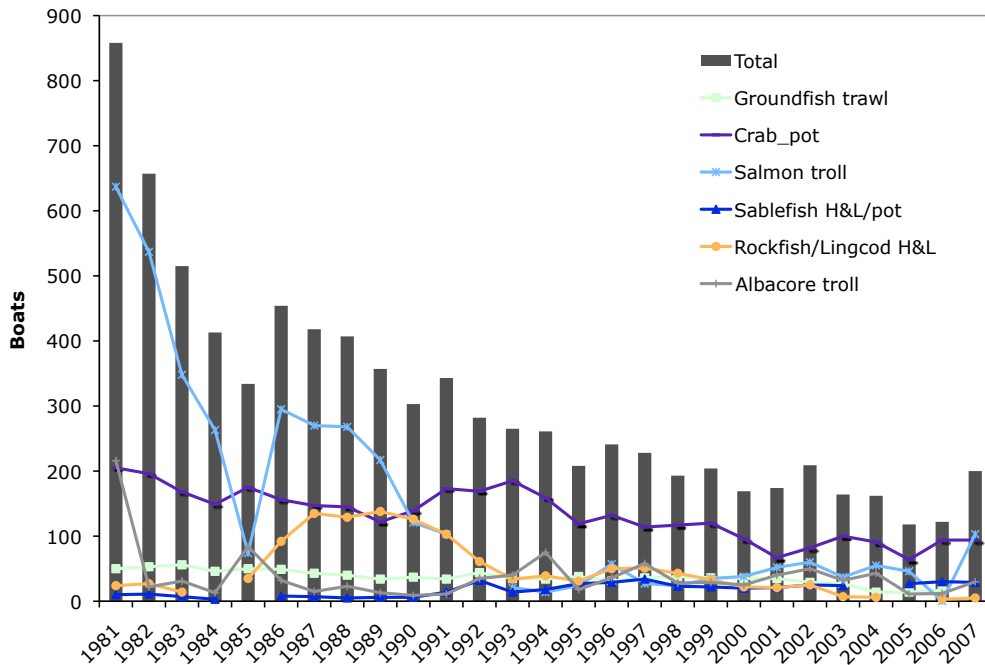


Figure 6. Number of boats with commercial fishery landings in the Eureka area for selected fisheries and overall, 1981–2007. Note: Activity cannot be reported for the individual fisheries when more than zero but fewer than three boats or buyers participated (i.e., rockfish/lingcod hook-and-line in 1984 and 2005, sablefish in 1985 and 2004, salmon in 1992, groundfish trawl in 2007).

limited entry program in the early 1980s. However, the number of boats participating in other fisheries has declined as well. Recent average participation was lower than long-term average participation by about 30% for crab and groundfish trawl and by 89% for rockfish. An exception to this decline is the sablefish fishery, where the average number of boats in recent years is 47% higher than the long-term average.

The Eureka area also experienced an overall decrease in the number of fishing trips (or deliveries; Figure 7). Average annual activity in recent years (2,200 trips) is down 45% from the long-term average of just over 4,000 trips. This decline is largely due to the greater than 70% declines in salmon and groundfish trips, a 22% decline in crab trips (even as landings and revenues increased), and reduced activity in most other fisheries. One exception is the whiting fishery, where average activity in recent years is 53% greater than the long-term

average, although the absolute numbers of trips and boats involved are small.

In all but three years between 1981 and 2007, crab trips accounted for a plurality (i.e., the greatest proportion, 25%–72%) of all trips in the Eureka area. On average, crab trips accounted for 46% of all deliveries over the long term and 62% in recent years. Groundfish trawl trips also have figured prominently, averaging 22% of all trips over the long term, and 10% in recent years. Salmon trips, which peaked at 37% of deliveries in 1982, declined from an average of 12% over the long term to 8% in recent years, whereas sablefish trips played an increasing role from 1992 onward.

Between 1981 and 1987, 24–35 buyers per year participated in Eureka area fisheries. The numbers trended upward to a peak of 68 in 2001, then declined to 30–36 between 2005 and 2007. Over the long term, an average of 60% of Eureka area buyers participated in the

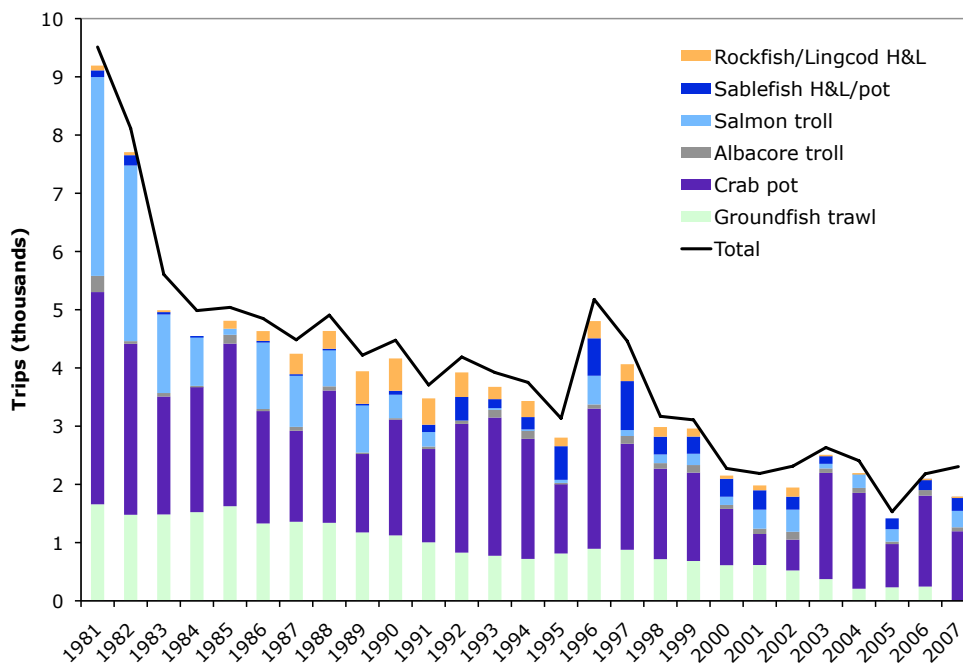


Figure 7. Number of trips by commercial fishing vessels landing in the Eureka area for selected fisheries and overall, 1981–2007. Note: Activity cannot be reported for the individual fisheries when more than zero but fewer than three boats or buyers participated (i.e., rockfish/lingcod hook-and-line in 1984 and 2005, sablefish in 1985 and 2004, salmon in 1992, groundfish trawl in 2007).

crab fishery, and at least 25% participated in the salmon, rockfish and albacore fisheries. Of the 30 buyers that received commercially-caught seafood in the Eureka area in 2007, at least five were locally-based nonfisherman businesses, at least nine were local fishermen, and seven were buyers based in other locations in California, and in Oregon and Washington.

Average annual ex-vessel price per pound for all fisheries combined is nearly the same in recent years (\$0.70) compared to the long term (\$0.71; see Table 8). These averages, however, mask substantial differences among fisheries. Prices are lower in recent years relative to the long term in the whiting (-40%), shrimp trawl (-36%), crab (-12%) and albacore (-5%) fisheries. In contrast, average annual ex-vessel prices were greater in recent years compared to the long term for several fisheries including rockfish (+45%), sablefish (+32%), salmon (+10%) and groundfish trawl (+5%).

The distribution of ex-vessel value among fishermen and buyers provides insights into the extent to which consolidation of fishing activity has occurred.³² Over the recent decade (1998–2007), even as the number of boats landing in the Eureka area varied between 114 and 197, revenue concentration changed little, with 34%–47% of boats accounting for 90% of landed value. Among buyers, revenue concentration is higher, with 21%–26% of buyers accounting for 90% of landed value between 1998 and 2000, and 9%–17% accounting for 90% of value between 2001 and 2007.

Activity Within Commercial Fisheries

The Groundfish Trawl Fishery

Many study participants consider groundfish trawl the backbone of the industry, keeping people and bills paid and filet lines active throughout the year. In 1981, more than 27

million pounds of trawl-caught groundfish valued at \$10.7 million were landed in the Eureka area (Figure 8, Table 9). At that time, and as far back as 1947, the fishery ranked first in terms of both landings and ex-vessel value. However, activity in the fishery has declined substantially, with average annual landings in recent years (4.7 million pounds) 62% lower compared to the long-term average of 12.3 million pounds. Most of this change can be attributed to declines in activity at Fields Landing, which accounted for about half of groundfish trawl activity in the early 1980s, but declined to zero by 2002, the year after Eureka Fisheries ceased operations.

Through the mid-1980s, ex-vessel value varied between \$7.2 million (in 1983) and \$11.3 million (in 1987), then declined fairly steadily to a low of \$2.1 million in 2004. Ex-vessel value increased only slightly thereafter. The average value of landings in recent years (\$2.7 million) is 57% lower than the long-term average (\$6.3 million).

Participation in the fishery by boats and buyers is 50% lower in recent years relative to the long term. Vessel participation declined steadily from 50–56 boats in the early 1980s to 35–38 boats in the late 1990s. Between 2003 and 2004, the number of boats in the fishery dropped by nearly half (27 to 14) due to participation in the trawl buyback program, then increased modestly to 19 boats by 2007. The number of buyers increased from 6–10 during the period 1981–1996 to 10–13 during the period 1997–2002, then declined to 2–7 in recent years.

The most marked change in groundfish trawl activity pertains to the number of trips, which is 70% lower in recent years (271 trips) relative to the long term (908 trips). Fishing activity declined steadily from 1,658 trips in 1981 to 522 trips in 2002. A marked decline

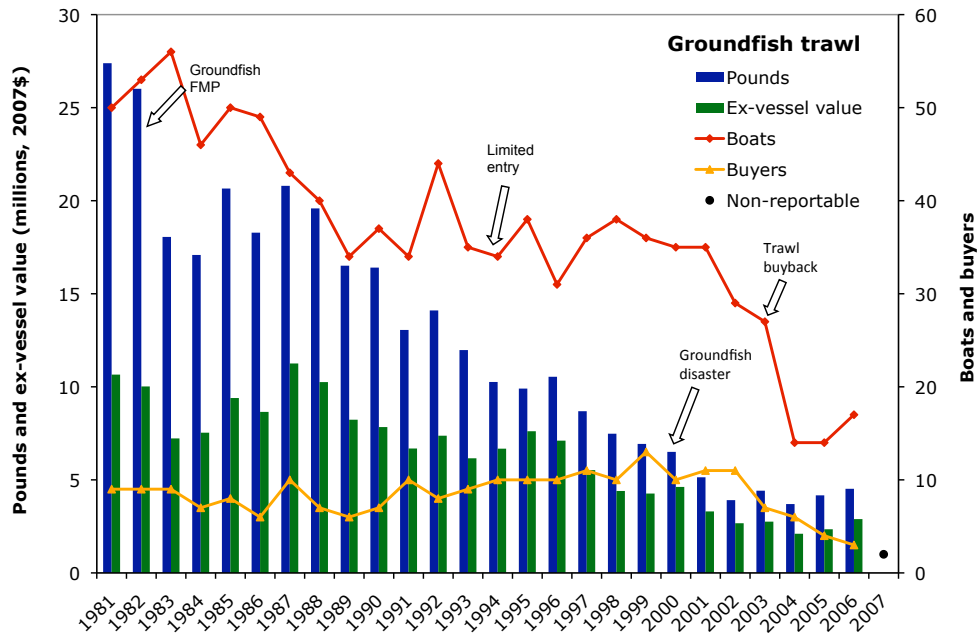


Figure 8. Landings, ex-vessel value (2007\$), and number of boats and buyers for the commercial groundfish trawl fishery in the Eureka area, 1981–2007. Note: Activity cannot be reported in 2007, when more than zero but fewer than three boats or buyers participated.

Table 9. Long-term and recent annual average, percent difference, and highs and lows in selected measures for the groundfish trawl fishery in the Eureka area, 1981–2007. Note: Years when more than zero but fewer than three boats or buyers participated are included in averages, but excluded from highs and lows.

	Long-term average (1981–2007)	Recent average (2003–2007)	Percent difference	High year(s) (amount)	Low year(s) (amount)
Groundfish trawl					
Landings (lbs)	12,315,890	4,653,293	-62	1981 (27,388,638)	2004 (3,699,406)
Ex-vessel value (\$)	6,339,241	2,741,236	-57	1987 (11,253,697)	2004 (2,103,863)
Boats	36	18	-50	1983 (56)	2004 (14)
Buyers	8	4	-50	1999 (13)	2006 (3)
Trips	908	271	-70	1981 (1,658)	2004 (208)
Price (\$/lb)	0.56	0.59	+5	1995 (0.77)	1981, 1982 (0.39)

occurred between 2003 (373 trips) and 2004 (208 trips), followed by an increase to 296 trips by 2007.

Average annual prices for trawl-caught groundfish in recent years are slightly higher compared to the long term, although this may be due to changes in the mix of species landed. Prices increased gradually from \$0.39 per pound in 1981 to \$0.51 in 1993, then to \$0.77

by 1995, and fluctuated between \$0.56 and \$0.71 in subsequent years.

The proportion of Eureka area landings accounted for by groundfish trawlers ranged from 48% to 85% during the period 1981–2002, then dropped to 19%–27% during the period 2003–2006 before increasing in 2007. The fishery accounted for 36%–71% of ex-vessel value between 1981 and 2001, and

19%–33% between 2002 and 2007. Groundfish trawl trips accounted for 19%–32% of all trips between 1981 and 2002, declining to 9%–15% in recent years. The proportion of Eureka area buyers participating in the fishery generally declined from 24%–33% during the period 1981–1985 to 7% in 2007. The proportion of Eureka area boats participating in the fishery increased from 6% in 1981 to 21% in 2000, then declined to 10% by 2007.



The Dungeness Crab Pot Fishery

Activity in the Dungeness crab fishery has been highly variable, with landings and value substantially greater in most recent years than over the long term (Figure 9, Table 10).³³ Landings ranged from about 355,000 pounds valued at \$1 million (in 2001) to nearly 5.6 million pounds valued at \$9.7 million (in 2003). Average annual landings in recent years (3.9 million pounds) are 79% higher compared to the long-term average of 2.2 million pounds, while landed value is 65% higher in recent

years (\$7.1 million) compared to the long-term average of \$4.3 million. By contrast, numbers of boats and trips are 33% and 22% lower, respectively, in recent years relative to the long term.

Aside from an upward trend in the early 1990s, the number of boats participating in the crab fishery has varied, but generally declined from 205 in 1981 to 94 in 2007. The average number of participating boats in recent years (89) is about a third less than the long-term average (133).

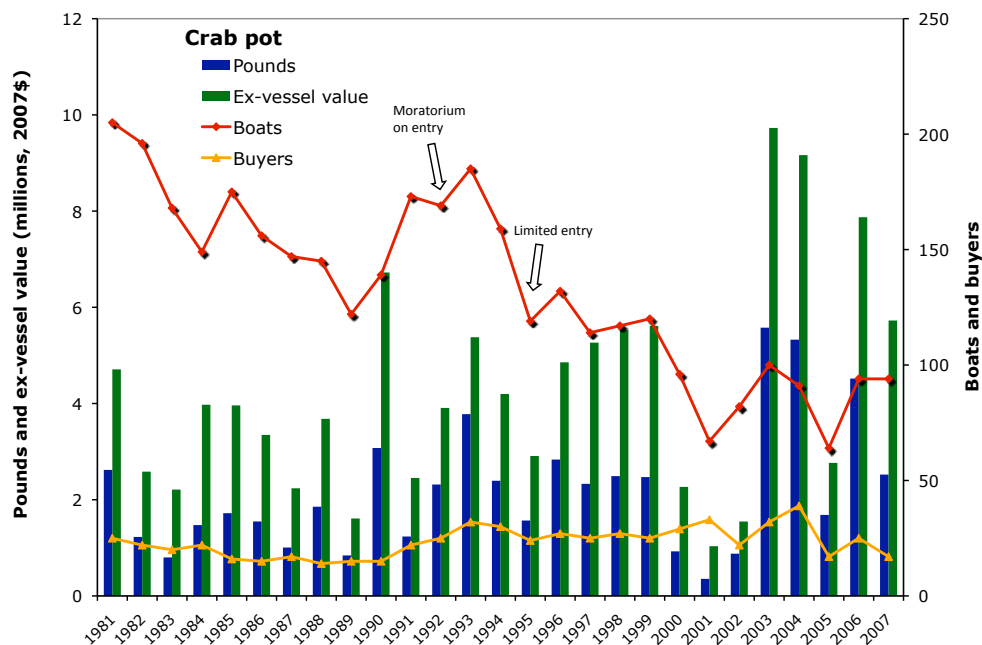


Figure 9. Landings, ex-vessel value (2007\$), and number of boats and buyers for the commercial Dungeness crab pot fishery in the Eureka area, 1981–2007.

Table 10. Long-term and recent annual average, percent difference, and highs and lows in selected measures for the commercial crab pot fishery in the Eureka area, 1981–2007.

Crab pot	Long-term average (1981–2007)	Recent average (2003–2007)	Percent difference	High year(s) (amount)	Low year(s) (amount)
Landings (lbs)	2,198,830	3,925,643	+79	2003 (5,576,527)	2001 (354,715)
Ex-vessel value (\$)	4,268,700	7,051,017	+65	2003 (9,728,650)	2001 (1,034,042)
Boats	133	89	-33	1981 (205)	2005 (64)
Buyers	23	26	+13	2004 (39)	1988 (14)
Trips	1,792	1,394	-22	1981 (3,645)	2002 (529)
Price (\$/lb)	2.06	1.82	-12	2001 (2.92)	1993 (1.42)

The number of crab trips declined fairly steadily from 3,645 in 1981 to 1,518 in 1999, then more sharply to 529 by 2002. Between 2003 and 2007, the number of trips ranged from 743 to 1,824 and averaged nearly 1,400 per year.

The number of crab buyers declined from 25 in 1981 to an average of 15 during the period 1988–1990, and fluctuated between 17 and 39 in subsequent years. The average number of buyers in recent years (26) is about 13% higher than the long-term average (23). However, the actual number of ‘fish houses—’ large volume fish buyers that process and distribute the catch— has declined in the region. Three such fish houses buy crab; most of the remaining buyers are smaller, less vertically integrated businesses, or fishermen selling their own catch.

Average annual crab prices varied widely from year to year, ranging from a low of \$1.42 per pound in 1993 to a high of \$2.92 in 2001. The average annual price for crab in recent years, \$1.82 per pound, is 12% lower than the long-term average of \$2.06 per pound.

Crab accounted for a generally increasing proportion of Eureka area landings from 1981 (7%) to 1999 (21%). After 2000, crab’s share of landings fluctuated widely, from lows of 4%–6% in 2001–2002 to highs of 35%, 28%

and 25% in 2003, 2004 and 2006 respectively. Crab’s contribution to total ex-vessel value follows a somewhat similar pattern, increasing from 18% in 1981 to 48%–50% in 1998–1999, exceeding 64% of value in 2003, 2004 and 2006.

The proportion of Eureka area boats that landed crab increased from 23% in 1981 to 70% in 1993, and 77% in 2006. Crab trips peaked at more than 68% of all trips in 2003, 2004 and 2006. The proportion of Eureka area buyers participating in the crab fishery increased from 61% to 76% between 1981 and 1985, fluctuating between 41% and 61% during the period 1987–1997, and between 42% and 70% after 1997.

The Salmon Troll Fishery

Historically, the commercial salmon fishery played a central role in the Eureka area (see Figure 2), with substantial activity into the early 1980s and again in the latter 1980s. Even now with very limited fishing opportunities, local fishermen continue to value salmon fishing as part of their annual round. Average annual salmon landings, value, boats and trips are 62%–72% lower in recent years relative to the long term.³⁴

Salmon troll landings totaled more than one million pounds in 1981 and 1982, worth \$4.3 million and \$3.8 million, respectively

(Figure 10; Table 11). Landings and revenues dropped sharply thereafter (with the exception of an uptick during the period 1986–1988) as increasingly strict KMZ management measures were implemented. During the period 1986–1988, landings and ex-vessel value, respectively, ranged between 425,000 and 679,000 pounds and \$1.1 million and \$2.7 million. Annual landings subsequently averaged 65,000 pounds and annual revenues averaged \$169,000 during the period 1989–2007.

Ex-vessel salmon prices generally stayed above \$3.00 per pound from 1981 through 1990, then fell below \$2.00 per pound during the period 1991–2003, in part due to increased competition from farmed salmon (Sylvia et al. 1998). In subsequent years, prices once again approached \$3.00 per pound, then jumped to a record \$5 per pound in 2007.

Landings and ex-vessel value for salmon have accounted for a relatively small proportion –

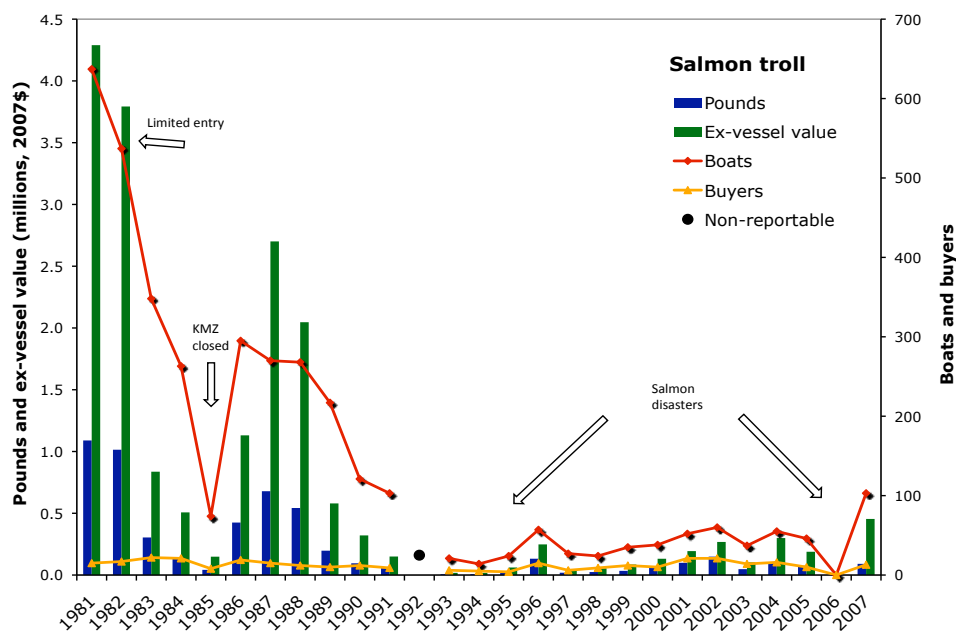


Figure 10. Landings, ex-vessel value (2007\$), and number of boats and buyers for the commercial salmon troll fishery in the Eureka area, 1981–2007. Note: Activity cannot be reported in 1992, when more than zero but fewer than three boats or buyers participated.

Table 11. Long-term and recent annual average, percent difference, and highs and (nonzero) lows in selected measures for the commercial salmon troll fishery in the Eureka area, 1981–2007. Note: Years when more than zero but fewer than three boats or buyers participated are included in averages, but excluded from highs and lows. Recent average price is based on 2003–2005 and 2007 data, as the fishery was closed in 2006.

Salmon troll	Long-term average (1981–2007)	Recent average (2003–2007)	Percent difference	High year(s) (amount)	Low year(s) (amount)
Landings (lbs)	210,067	79,093	-62	1981 (1,089,485)	1994 (7,032)
Ex-vessel value (\$)	691,122	208,898	-70	1981 (4,289,393)	1994 (17,370)
Boats	138	48	-65	1981 (637)	1994 (14)
Buyers	12	11	-8	1983 (22)	1995 (4)
Trips	577	163	-72	1981 (3,415)	1994 (15)
Price (\$/lb)	2.85	3.14	+15	2007 (5.01)	2002 (1.80)

less than 5% in both cases – of the totals for Eureka area commercial fisheries. However, in terms of boats and buyers, the salmon fishery has played a more substantial role. Through the early 1980s, between 64% and 82% of boats landed salmon, and between 43% and 72% of buyers received the catch. Except for 1985, when the KMZ was closed, more than 60% of boats and 35% of buyers participated in the salmon fishery through 1989. Participation dropped sharply through the early 1990s with the 1992–1995 KMZ closure, and ranged around 10% for boats and buyers most years through 1998. After that, participation varied but generally climbed to around 30% in the 2000s except for 2006, when the KMZ again was closed. In 2007, 52% of boats and 43% of buyers participated in the fishery.



miles of the Humboldt County coast; in other years, they are distributed much further offshore or north off the coast of Oregon and Washington. As a result, somewhat more than other fisheries, participants include several nonresident as well as resident vessels that are part of the West Coast albacore fleet.

The Albacore Troll Fishery

Albacore tuna is a highly migratory species whose distribution is affected strongly by oceanic conditions and events (particularly El Niño events), and availability of prey. In some years, the fish migrate within 10–50

Fishery activity was extraordinarily high in 1981 relative to subsequent years (Figure 11, Table 12). More than 200 boats landed 3.6 million pounds worth about \$6.5 million. By 1983, landings dropped to 58,000 pounds worth \$65,000 landed by 31 boats. The abrupt decline reflected a statewide contraction of

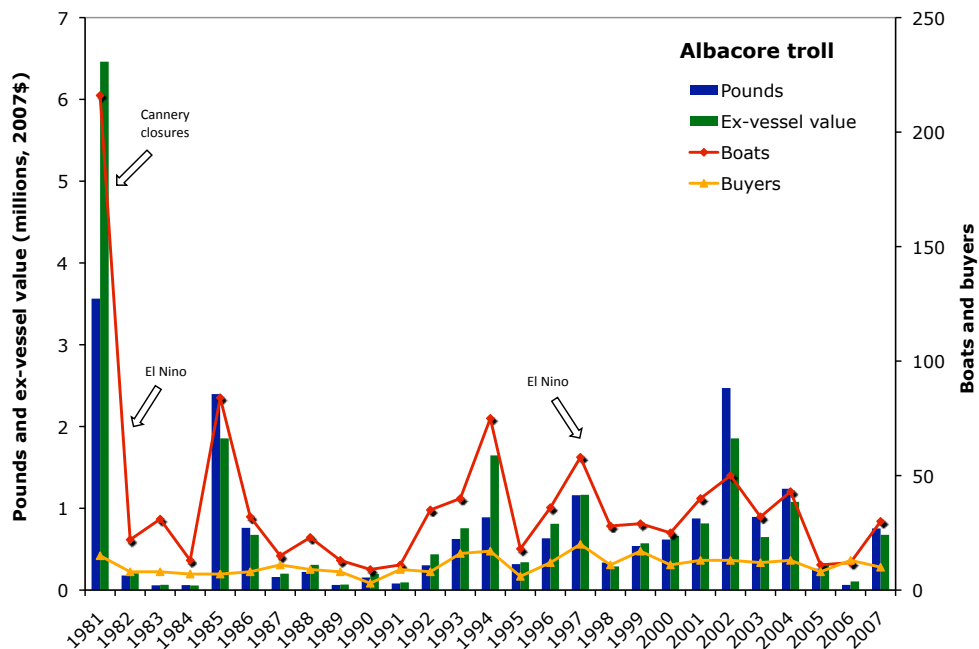


Figure 11. Landings, ex-vessel value (2007\$), and number of boats and buyers for the commercial albacore troll fishery in the Eureka area, 1981–2007.

Table 12. Long-term and recent annual average, percent difference, and highs and lows in selected measures for the commercial albacore troll fishery in the Eureka area, 1981–2007.

Albacore troll	Long-term average (1981–2007)	Recent average (2003–2007)	Percent difference	High year(s) (amount)	Low year(s) (amount)
Landings (lbs)	728,882	642,313	-12	1981 (3,563,725)	1983 (58,278)
Ex-vessel value (\$)	828,538	566,694	-32	1981 (6,461,020)	1984 (56,650)
Boats	38	26	-32	1981 (216)	1990 (9)
Buyers	11	11	0	1997 (20)	1990 (3)
Trips	84	73	-13	1981 (278)	1984 (19)
Price (\$/lb)	1.14	1.08	-5	1994 (1.85)	2003 (0.72)

the tuna fishery following the relocation of most major Southern California tuna canneries offshore (e.g., to American Samoa). As a result, many fishery participants now market their catch through direct sales or deliver to one of the few remaining canneries in Oregon or Washington.³⁵

After 1981, activity in the fishery continued to be highly variable, with lesser peaks in 1985, 1994, 1997 and 2002. Average annual ex-vessel value of landings and number of boats in the fishery are 32% lower in recent years compared to the long term. More modest declines in landings, trips and prices occurred as well.

The number of boats landing albacore at Eureka has varied, largely in parallel with landings and value. Following 1981 high of 216 boats in the fishery, participation varied between 9 and 84 boats (in 1990 and 1985, respectively). The number of buyers was less variable, averaging 11 for both periods, and ranging between three in 1990 and 20 in 1997. These numbers include several fishermen who market their own catch through off-the-boat sales and other means.

The average annual ex-vessel price in recent years, \$1.08 per pound, is 5% lower than the long-term average of \$1.14 per pound, although prices ranged widely, between \$0.72 and \$1.85 per pound.

During the period 1982–2007, albacore landings, ex-vessel value and trips accounted for an annual average of 2%–5% of activity at the port. Over the same period, an average 5% of boats (peaking at 29% in 1994) and 21% of buyers participated in the albacore fishery.

The Sablefish Hook-and-Line Fishery

The sablefish hook-and-line (longline) fishery has played a modest role at Eureka, accounting on average for less than 5% of landings and ex-vessel value, and less than 10% of trips at Eureka and Fields Landing combined. Historically, most sablefish was landed in the groundfish trawl fishery. When sablefish became more valuable in response to the growing Asian market, and as the trawl fishery became more heavily regulated, they were targeted more in the hook-and-line fishery, particularly in the Open Access sector. Vessel participation, ex-vessel revenues and prices in the fishery have increased in recent years relative to the long term (Figure 12, Table 13). Given the limited change in landings over these same time periods, recent revenue increases are largely due to price increases in the fishery overall.

Sablefish landings varied considerably between 1981 and 1989, with exceptionally high landings in 1982 and 1986 (848,000 and 592,000 pounds, respectively) and exceptionally low landings (29,000–121,000

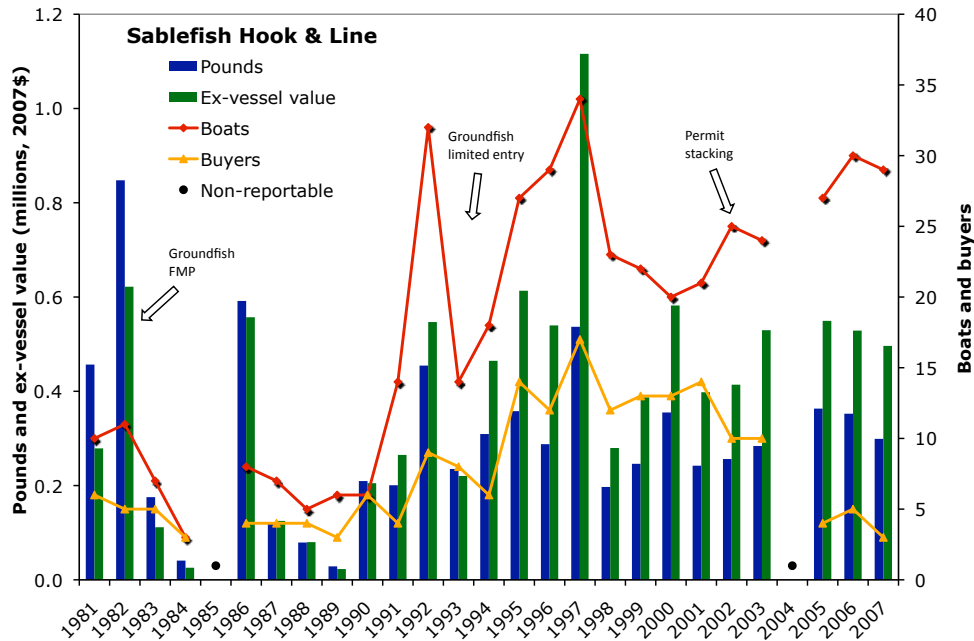


Figure 12. Landings, ex-vessel value (2007\$), and number of boats and buyers for the commercial sablefish hook-and-line fishery in the Eureka area, 1981–2007. Note: Activity cannot be reported in 1985 and 2004, when more than zero but fewer than three boats or buyers participated.

Table 13. Long-term and recent annual average, percent difference, and highs and lows in selected measures for the commercial sablefish hook-and-line fishery in the Eureka area, 1981–2007. Note: Years when more than zero but fewer than three boats or buyers participated are included in averages, but excluded from highs and lows.

Sablefish hook-and-line	Long-term average (1981–2007)	Recent average (2003–2007)	Percent difference	High year(s) (amount)	Low year(s) (amount)
Landings (lbs)	294,284	290,467	-1	1982 (847,674)	1989 (28,555)
Ex-vessel value (\$)	388,931	485,435	+25	1997 (1,115,950)	1989 (22,893)
Boats	17	25	+47	1997 (34)	1984 (3)
Buyers	7	5	-29	1997 (17)	1983, 1984, 2007 (3)
Trips	212	161	-24	1997 (841)	1984 (5)
Price (\$/lb)	1.31	1.73	+32	2004 (2.10)	1981 (0.61)

pounds) in 1984 and 1987 through 1989. In subsequent years, landings became somewhat less variable, ranging between a reportable low of 205,000 pounds (in 1990) and 537,000 pounds (in 1997). Ex-vessel values exhibited similarly high variability from 1981 through 1989, ranging from less than \$26,000 (in 1984 and 1989) to \$622,000 (in 1982). After 1990, the annual ex-vessel value of the fishery

varied between \$210,000 and \$610,000, except in 1997, when it peaked at more than \$1.1 million.

Vessel participation in the sablefish fishery increased over time as opportunities in other fisheries diminished. The number of boats ranged from 3 to 11 during the 1980s and from 14 to 34 thereafter. The number of sablefish

trips ranged from 5 to 177 during the period 1981–1991, increased to a peak of 841 in 1997, and ranged from 56 to 333 in subsequent years.

Through 1991, fewer than seven buyers participated in the sablefish fishery each year. The number increased thereafter to a peak of 17 buyers in 1997, declining to fewer than six since 2004.

The average annual price per pound for line-caught sablefish has increased over time, from a low of between \$0.61 and \$0.73 per pound during the period 1981–1984 to at least \$1.50 per pound in most years since 1994, peaking at more than \$2.00 per pound in 1997 and 2004.

The sablefish fishery has consistently accounted for less than 3% of Eureka area landings and less than 8% of ex-vessel value. The contribution to boats, trips and buyers, however, has been more variable. Prior to 1992, sablefish boats comprised less than 4% of all Eureka area boats. That proportion subsequently increased to 23% by 2005–2006, then declined to 15% in 2007. Sablefish trips exhibited a somewhat similar pattern. The proportion of Eureka area buyers receiving sablefish ranged from 8% to 22% through 1995, peaked at 37% in 1995, declined to 4% in 2004, and ranged from 10% to 14% thereafter.

The Whiting (Hake) Trawl Fishery

The whiting trawl fishery is managed under the federal Groundfish FMP, but is distinct from the groundfish trawl fishery in its use of midwater rather than bottom trawl gear as well as the species targeted. The small number of participants precludes reporting of annual activity in the fishery in all but two years: 1987 and 2001. Thus only average estimates of fishing activity computed over multiple years are provided here.

Average landings, revenues and trips are, respectively, 144%, 71% and 53% higher in recent years relative to the long term (Table 14). Whereas the number of buyers is unchanged, both the number of boats and average price per pound are 40% lower in recent years relative to the long term.

During the period 1981–1999, whiting landings averaged 1.4 million pounds with an ex-vessel value of \$177,000. Activity diminished considerably during the period 1992–1999 relative to the previous period, due in part to the expansion in whiting fishing and processing capacity in Oregon and Washington, where whiting stocks are more abundant (Freese et al. 1995, Leet et al. 2001). From 2000 on, however, activity in the Eureka area has increased substantially, averaging 5.2 million pounds and \$333,000 in value, although the number of participants remained low.

Table 14. Long-term and recent annual average, percent difference, and highs and lows in selected measures for the commercial whiting trawl fishery in the Eureka area, 1981–2007. Note: Years when more than zero but fewer than three boats or buyers participated are included in averages, but excluded from highs and lows.

Whiting trawl	Long-term average (1981–2007)	Recent average (2003–2007)	Percent difference	High year(s) (amount)	Low year(s) (amount)
Landings (lbs)	2,532,663	6,180,985	+144	2006 (8,816,849)	1995 (209,789)
Ex-vessel value (\$)	223,265	382,689	+71	2004 (567,318)	1999 (12,874)
Boats	5	3	-40	1983 (13)	2001 (3)
Buyers	2	2	0	1987 (5)	2001 (3)
Trips	38	58	+53	2004 (80)	2001 (14)
Price (\$/lb)	0.10	0.06	-40	1981 (0.16)	2001 (0.05)

Ex-vessel prices have undergone a steady decline, from \$0.16 per pound in 1981 to as low as \$0.05 per pound in recent years. Northern California processors we interviewed attributed declining ex-vessel prices to increased competition with other whiting-producing countries.

Whiting accounted, on average, for 5% or less of total ex-vessel value, boats, buyers and trips in the Eureka area during between 1981 and 2007. As a relatively high-volume fishery, however, its contribution to Eureka landings has been higher, averaging 14% over the long term and 37% in recent years.

The Pink (Ocean) Shrimp Trawl Fishery

The trawl fishery for pink shrimp started along the North Coast in the 1950s with landings first recorded in 1958. Through 1980, shrimping (primarily trawling) tended to occur in pulses (i.e., 1963–1965, 1969–1971, 1975–1979.) Shrimp trawl activity expanded in the 1970s,

due largely to changes in harvest technology (e.g., double-rig trawl nets) and increased processing capacity (e.g., shrimp peeling machines; Frimodig et al. 2009).

At over 800,00 pounds, average landings in recent years have been similar to long-term average landings, while recent ex-vessel revenues, boats, buyers, trips and prices are 22%–60% lower relative to the long term (Figure 13, Table 15).

The fishery experienced notable activity in landings and revenues between 1992 and 1997 and a more modest pulse between 2001 and 2005. Landings and revenues were particularly low in El Niño years (1983, 1998). Vessel participation exceeded 10 boats only once during the 1980s, increased to a peak of 42 boats in 1997, then declined to three vessels in recent years. The number of buyers peaked at 11 in 1996 and 1997 and was considerably lower in other years. Prices steadily declined

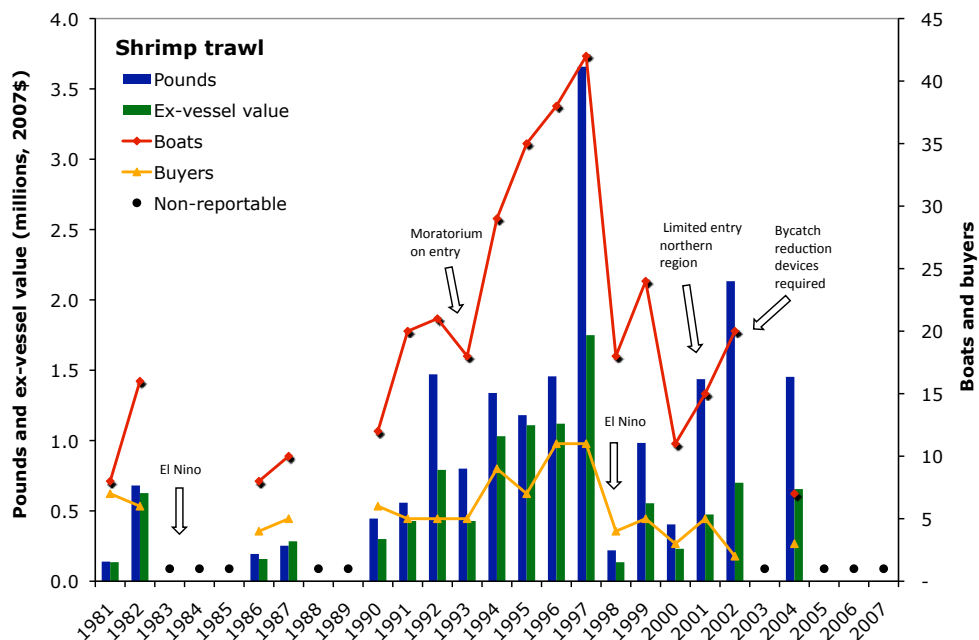


Figure 13. Landings, ex-vessel value (2007\$), and number of boats and buyers for the commercial shrimp trawl fishery in the Eureka area, 1981–2007. Note: Activity cannot be reported in 1983–1985, 1988–1989, 2003 and 2005–2007, when more than zero but fewer than three boats or buyers participated.

Table 15. Long-term and recent annual average, percent difference, and highs and lows in selected measures for the commercial shrimp trawl fishery in the Eureka area, 1981–2007. Note: Years when greater than zero but fewer than three boats or buyers participated are included in averages, but excluded from highs and lows.

Shrimp trawl	Long-term average (1981–2007)	Recent average (2003–2007)	Percent difference	High year(s) (amount)	Low year(s) (amount)
Landings (lbs)	819,800	840,430	+3	1997 (3,657,626)	1983 (160)
Ex-vessel value (\$)	459,305	359,178	-22	1997 (1,749,391)	1983 (221)
Boats	15	6	-60	1997 (42)	2006, 2007 (3)
Buyers	4	2	-50	1996 (11)	2000, 2004 (3)
Trips	65	28	-57	1997 (202)	2000 (24)
Price (\$/lb)	0.66	0.42	-36	1983 (1.38)	2001 (0.33)

from \$0.92–\$1.38 per pound during the period 1981–1983 to \$0.33–\$0.49 per pound since 2001.

The shrimp trawl fishery accounted, on average, for less than 6% of landings, revenues and trips, with less than 6% of boat participating between 1981 and 2007. Approximately 11% of Eureka area buyers received shrimp over the same period. However, during the surge that occurred in the mid-1990s, the shrimp trawl fishery accounted for as much as 20% of landings and 11% of value, and involved up to 18% of boats and 25% of buyers.

The Rockfish/Lingcod Hook-and-Line Fishery

The Eureka area commercial hook-and-line fishery for rockfish and lingcod is relatively small in terms of landings and ex-vessel value (less than 2% of activity overall), but participation has been more substantial, averaging 15% of boats and 30% of buyers over the long term. The fishery grew rapidly in the 1980s with general growth of the Asian market for fresh fish and the expansion of the live fish market in the San Francisco Bay area in the 1990s (McKee-Lewis 1996). During the peak of the fishery (1987–1992), annual landings ranged between 296,000 and 832,000 pounds and ex-vessel value ranged between

\$383,000 and \$913,000 (Figure 14, Table 16). Fishing activity, on all measures, has declined significantly in recent years relative to the long term. Landings and value declined through the 1990s, and then dropped sharply with the implementation of a moratorium on entry in 1999 and restricted access in 2003, along with significant reductions in quotas for key species through the federal groundfish management process. From 2004 on, annual participation did not exceed five boats and 13 trips, and annual landings and revenues remained below 15,400 pounds and \$27,300 respectively. Between 1981 and 2007, 9–20 buyers participated annually in the fishery, with the notable exception of 1984, when fewer than three buyers participated. Since 2003, however, 3–7 buyers have participated, reflecting declines in both the number of fishermen selling their catch directly to local groceries and restaurants and the number of dedicated fish buyers. Study participants attributed this change to the sharp reduction in fishing opportunities and activity in recent years, which made it untenable for small buyers from the San Francisco Bay area to travel to Eureka to buy the catch.

Average annual price per pound varied between \$0.89 and \$2.14 through 1987, fell to \$0.59–\$0.97 per pound during the period 1989–1998, and increased to a high of \$3.02 per pound by

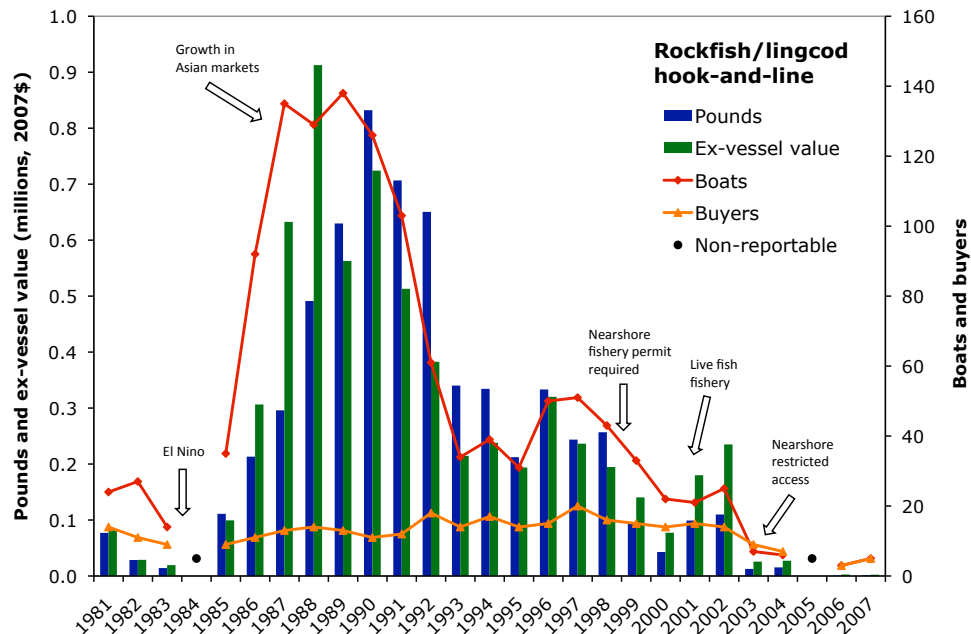


Figure 14. Landings, ex-vessel value (2007\$), and number of boats and buyers for the commercial rockfish/lingcod hook-and-line fishery in the Eureka area, 1981–2007. Note: Activity cannot be reported in 1984 and 2006, when more than zero but fewer than three boats or buyers participated.

Table 16. Long-term and recent annual average, percent difference, and highs and lows in selected measures for the commercial rockfish/lingcod hook-and-line fishery in the Eureka area, 1981–2007. Note: Years when more than zero but fewer than three boats or buyers participated are included in averages, but excluded from highs and lows.

Rockfish/Lingcod hook-and-line	Long-term average (1981–2007)	Recent average (2003–2007)	Percent difference	High year(s) (amount)	Low year(s) (amount)
Landings (lbs)	227,744	6,221	-97	1990 (832,136)	2006 (884)
Ex-vessel value (\$)	235,337	11,831	-95	1988 (912,676)	2006 (2,667)
Boats	47	5	-89	1989 (138)	2006 (3)
Buyers	12	5	-58	1997 (20)	2006 (3)
Trips	185	10	-95	1989 (560)	2006 (3)
Price (\$/lb)	1.38	2.00	+45	2006 (3.02)	1992 (0.59)

2006. In addition to reflecting market conditions, average prices also reflect the relative proportion of live and dead fish in the catch, as live fish command a much higher price.

Commercial Fishery Combinations

Commercial fishery participants move among fisheries, ports and fishing areas in response to changes in resource availability, regulations,

weather and other factors. Reflecting the highly constraining nature of regulations in recent years, one fisherman noted, “You follow the seasons, the regulations, not so much the fish.”

For purposes of identifying trends in fishery participation, it would be reasonable to focus on boats that are resident (homeported) in the Eureka area. Although recent data on resident vessels were collected during fieldwork for

this project, similar data for earlier years are not readily available. Thus, rather than focusing on resident vessels, we focus on those fishing operations that earned a plurality (i.e., the greatest proportion) of their annual ex-vessel revenues from landings at Eureka or Fields Landing (referred to here as ‘Eureka area boats’). Although there may be some coincidence between these two methods of vessel classification, plurality of revenue is at best a rough criterion for identifying a vessel’s port of residence, given the importance of mobility to the viability of many fishing operations.

We identified 26 one-, two- and three-way fishery combinations common to these Eureka area vessels during the periods: 1981–1983, 1993–1995 and 2005–2007 (Figure 15, Table 17). In Figure 15, the numbers in each box indicate the average annual number of vessels that participated exclusively in that fishery in each time period. For example, an annual average of 135 boats participated only in the salmon troll fishery during the first period

(1981–1983), an average of fewer than three participated in this fishery during the second period (1993–1995), and an average of four participated during the third period (2005–2007). The numbers on the lines connecting two boxes indicate the average number of vessels that participated exclusively in the fisheries denoted by those two boxes. For example, the line connecting the salmon troll and crab pot boxes indicates that an annual average of 81 vessels participated in both the salmon and crab fisheries (only) during the first period, 10 did for the second period, and 12 did for the third period.

A number of fisheries and fishery combinations that existed in 1981–1983 and 1993–1995 are no longer pursued (or are pursued by too few boats to report). Among the most notable changes are the reductions in salmon troll-only, salmon troll combination, and groundfish trawl-only vessels. The average number of crab pot-only vessels more than doubled from 1981–1983 to 1993–1995, then declined to early 1980s levels in 2005–2007. Exceptions

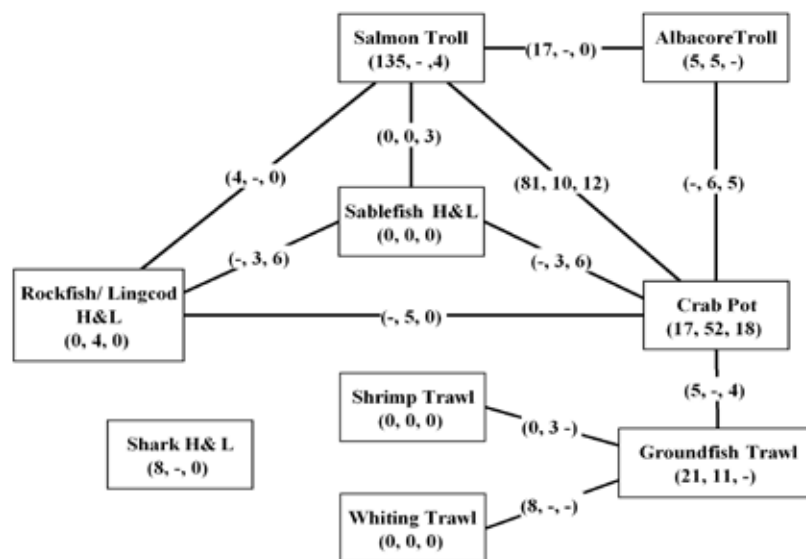


Figure 15. Major one- and two-way fishery combinations utilized by Eureka area boats based on three-year averages for 1981–1983, 1993–1995 and 2005–2007. Notes: “-” indicates fishery combinations involving only one or two boats, and cannot be reported because of confidentiality rules. H&L = hook-and-line fishery.

Table 17. Major three- and four-way fishery combinations utilized by Eureka area boats in each of three periods. Notes: “-” indicates fishery combinations involving only one or two boats, and cannot be reported because of confidentiality rules. H&L = hook-and-line.

Fishery combination	1981–1983	1993–1995	2005–2007
	Average	Average	Average
Salmon Troll – Crab Pot – Albacore Troll	22	5	-
Salmon Troll – Crab Pot – Rockfish H&L/Pot	11	6	0
Salmon Troll – Crab Pot – Sablefish H&L/Pot	3	-	6
Albacore Troll – Crab Pot – Rockfish H&L/Pot	-	6	0
Rockfish H&L/Pot – Crab Pot – Sablefish H&L/Pot	0	5	-
Groundfish Trawl – Crab Pot – Shrimp Trawl	-	5	-

to this general decline are fishery combinations involving sablefish hook-and-line, although the absolute numbers of boats involved are quite modest. The changing nature of fishery combinations reflects the general downsizing of commercial fisheries in the Eureka area (and statewide), and regulatory changes, especially in the groundfish and salmon fisheries.

Revenue Per Boat

Trends in aggregate revenues (see Figure 5) do not necessarily correlate with how individual

vessels are faring in terms of revenue. To illustrate this point, we estimated average annual revenue per boat for Eureka area boats (i.e., those that earned a plurality of their annual ex-vessel revenues from landings at Eureka or Fields Landing).

Whereas the number of Eureka area boats declined from 439 in 1981 to 88 in 2007, the average annual revenue per boat (based on their landings at all ports for all fisheries) increased from less than \$65,000 prior to 1985 to greater than \$100,000 since 2003 (Figure 16).

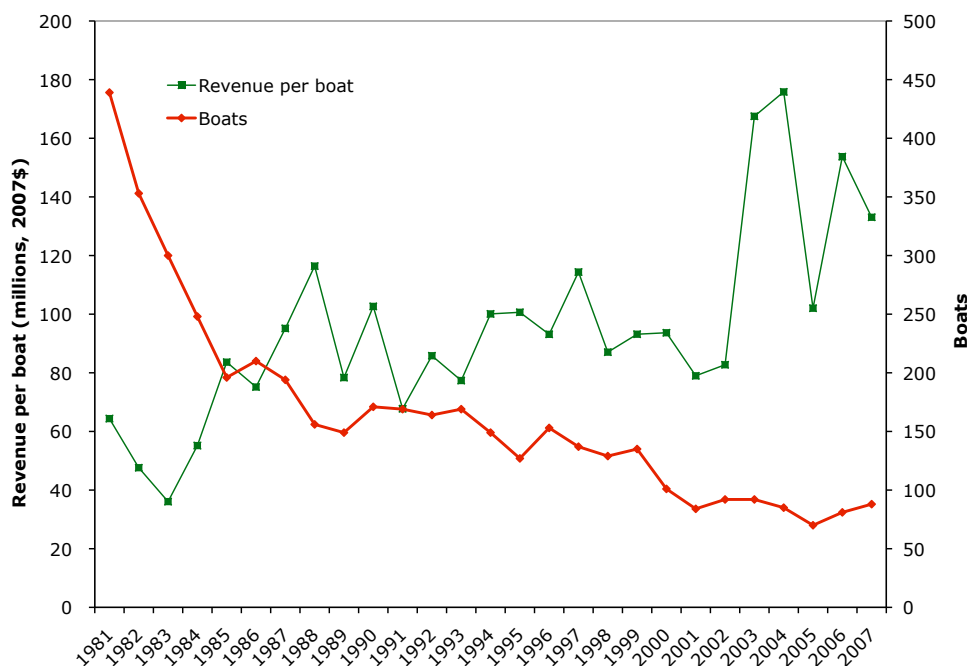


Figure 16. Number of boats with the plurality of revenue from landings in the Eureka area, and average annual revenue per boat, 1981–2007.

To better understand how vessel revenue is affected by fishery-specific participation, we assigned each Eureka area boat to its ‘principal fishery,’ that is, the fishery from which the boat derived the plurality of its annual revenue. For vessels associated with each principal fishery, we then estimated average annual revenue per boat (based on their landings at all ports and for all fisheries). Estimates for 1981–1983, 1993–1995 and 2005–2007 indicate a significant decline in the number of vessels whose principal fishery was salmon troll,

and lesser though substantial declines in the numbers of groundfish trawlers and albacore trollers (Table 18). Average annual revenue per boat consistently increased for vessels whose principal fishery is groundfish trawl, crab pot, or albacore troll. Whether these trends are indicative of future trends is uncertain, given the high degree of variability in these and other fisheries included in the revenue estimates. It is also unclear whether increases in revenue per vessel have kept pace with increasing costs.

Table 18. Average annual revenue per boat (2007\$) for Eureka area boats, by major fishery and overall, 1981–1983, 1993–1995 and 2005–2007. Notes: “-” indicates fishery combinations involving only one or two boats, and cannot be reported because of confidentiality rules. At least three unique boats participated in the shrimp trawl fishery during the periods 1981–1983 and 1993–1995.

Major Fishery	Number of Boats			Average Annual Revenue Per Boat (All Ports, All Fisheries)		
	1981– 1983	1993– 1995	2005– 2007	1981– 1983	1993– 1995	2005– 2007
Groundfish trawl	36	21	10	\$263,754	\$353,697	\$369,229
Crab pot	74	90	49	\$37,261	\$42,645	\$110,849
Shrimp trawl	2	2	-	\$86,854	\$123,201	-
Albacore troll	23	12	3	\$64,766	\$73,499	\$80,222
Sablefish H&L	-	6	7	-	\$108,273	\$63,064
Salmon troll	206	7	9	\$13,643	\$22,091	\$15,334
Rockfish/lingcod H&L	-	8	-	-	\$28,613	-
All boats	364	148	80	\$49,360	\$92,699	\$129,601

RECREATIONAL FISHERY ACTIVITY IN THE EUREKA AREA

As salmon regulations became more restrictive in the 1990s, anglers at Humboldt Bay ports increasingly targeted groundfish – especially rockfish and lingcod – in the ocean fishery. Since the late 1990s, groundfish fishing opportunities also have become increasingly constrained by regulations. Anglers also target halibut primarily during the summer and crab in winter within (and in some cases outside) the bay. Some fishermen participate in the recreational albacore fishery in the late summer and early fall but generally only if the resource is within about 20–30 miles of the coast (and the weather is good). However, the ocean salmon fishery remains most highly valued by anglers.³⁶

According to study participants, the primary modes of recreational fishing in Eureka area are private boat and CPFV, with both modes more active in the 1980s and 1990s than in recent years. However, confidentiality rules limit reporting of port-specific CPFV estimates of effort and harvest levels, and there are no port-specific estimates of private boat effort. The CDFG's California Recreational Fisheries Survey (CRFS)³⁷ provides estimates at the 'district' level. Eureka lies in the 'Redwood District', which encompasses all of Humboldt and Del Norte counties (except for Shelter Cove in Southern Humboldt County). Those data are presented here to provide the larger context of Eureka area recreational fisheries.

Port-specific estimates of CPFV effort and harvest are available from logbooks, but these cannot be fully reported due to confidentiality requirements. The CPFV trends described here should be viewed with caution because not all CPFV operators comply with the logbook requirement. In the discussion of CPFV logbook data below, the *long term* is the period

from 1980 through 2007, while *recent years* pertains to the most recent five years of the time series (2003–2007).³⁸ Salmon effort and harvest estimates are available from CDFG's Ocean Salmon Project (OSP); however, OSP estimates for the Eureka area include Trinidad, a separate community 25 miles to the north.³⁹

Recreational Fishing Effort

According to the CRFS, an annual average of 143,300 angler trips were made in the Redwood District between 2005 and 2007. About 31% of these trips were from private boats, 32% from beach/bank, 34% from manmade structures, and 3% from charters. It is difficult to determine how much of the recreational effort in the Redwood District is associated with Humboldt Bay ports, as the CRFS does not provide effort estimates by port. However, consistent with CRFS results for the district as a whole, study participants in Humboldt Bay reported that private boat activity has consistently far exceeded charter activity.

According to CPFV logbooks, charter fishing activity at Humboldt Bay ports varied but generally increased through 1990. Effort averaged 4 boats, 90 boat trips and 576 angler trips per year during 1981 and 1982, increasing to 11 boats, 481 boat trips and 4,221 angler trips during 1989 and 1990.⁴⁰ Activity peaked in 1990, when 12 boats reported 407 boats days and 3,636 angler days. Effort dropped sharply in the early 1990s and has remained low, averaging 2 boats, 73 boat trips and 543 angler trips per year during the period 1991–2007.

Charter activity at Humboldt Bay ports decreased not only absolutely but also as a proportion of Redwood District activity.

Humboldt Bay accounted for an average of 48%, 40% and 17% of all party/charter boats operating in the Redwood District during the periods 1980–1990, 1991–2000 and 2001–2007, respectively.



According to the OSP, recreational salmon effort in the Eureka area averaged 27,800 angler trips between 1981 and 1991 and 13,000 trips between 1992 and 2002. These estimates provide a somewhat inflated representation of Eureka’s salmon fishery, as they include data from Trinidad as well. The dominance of private boat relative to CPFV activity is also apparent from OSP, in that CPFV activity accounted for no more than 15% of total activity during the years 1981–2007.

KEY FACTORS AFFECTING EUREKA AREA FISHERIES

Eureka's fisheries and fishing community have experienced considerable social and economic change over the past 30 years. Regulatory, market and environmental factors have influenced individuals and communities, sometimes gradually and at other times more abruptly. Some of these factors originated locally, while others are regional, national or even international in nature. Moreover, they do not operate in isolation. Rather, they interact in complex and cumulative ways, posing both challenges and opportunities to the viability and resilience of the Eureka fishing community. The following discussion focuses on factors highlighted by study participants as having most influenced local fisheries, infrastructure and the community as a whole.

Regulatory Factors

Commercial Fisheries

The first commercial fishery to be heavily restricted along the North Coast of California was the ocean salmon troll fishery. Participants discussed the establishment of the KMZ in 1979 (and subsequent restrictions on seasons and catch), the implementation of limited entry in 1982, and the 1993 changes to the tribal allocation as key factors influencing the fishing community.

The effect of these regulations was a decrease in fishery participants and activity over time, and an overall shift of the salmon fishery away from Eureka. Some fishermen shifted their effort into other local fisheries, including groundfish and crab. Those who chose to remain in the fishery traveled as far south as Monterey Bay, or north to Oregon and even southeast Alaska. One study participant explained:

Starting in 1993, the tribes got 50%, and we began fishing farther from the Klamath River. One of the social consequences of mobility was that we [now] have good friends who live in other ports. But there was also estrangement from the local community. Mobility was attractive. Marriages [were affected] ...you became a gypsy.

Of the estimated 45 commercial trollers based at Eureka in recent years, about two dozen travel north and south for salmon (except during the 2008 and 2009 statewide salmon fishery closures), landing their catch at other ports within and outside the state. In addition to catch being sold elsewhere, while in port fishermen also purchase provisions, goods and services. As a result, the direct economic benefits of their salmon fishing activity are realized at those other ports rather than at Eureka.

Regulatory changes in the groundfish fishery beginning in the 1990s, including increasingly restrictive harvest measures, an industry-funded groundfish trawl buyback (in which 14 of 27 Eureka-based trawlers participated), additional vessel monitoring requirements, and the establishment of RCAs, affected the community through an overall decrease in activity. Shoreside, the reductions in the amount of fish landed in the salmon and groundfish fisheries made it difficult for some processors to maintain sufficient production to keep employees busy year-round, and ultimately to stay in business. According to one participant, "they used to say, you pay the bills with groundfish and you make money with salmon." With recent production less than half of long-term levels, local receiving capacity has become more consolidated (i.e., a smaller proportion of buyers now accounts

for the majority of landed value). In addition, whereas as many as five fish houses processed groundfish (and other species) at one time, only one does presently; a second business processes some crab locally and trucks groundfish to Fort Bragg for processing. Although Eureka has become a center for processing groundfish and shrimp landed at other Northern California ports as well as locally, the loss of a number of fish houses has resulted in fewer market options for fishermen and fewer jobs and economic benefits for the community.

The groundfish trawl buyback, which was approved following a referendum of permit holders, has had some negative repercussions.⁴¹ For example, some study participants reported increased tensions in the crab fishery, including resentment among nontrawler crabbers regarding the required 1.24% assessment on the value of the crab catch to repay the buyback loan. Others noted a shift of effort from groundfish to crab and albacore, resulting in a larger fleet with greater capacity in those fisheries and adding to tensions in the crab fishery. In addition, the Harbor District and the city have been left with a number of abandoned vessels whose removal and clean-up are costly.



Recreational Fisheries

Concerns about the status of salmon stocks led to shorter recreational seasons and other more stringent regulations, a situation exacerbated by the 1993 tribal/nontribal allocation decision. With the reduction in salmon fishing opportunities, some private boat anglers shifted their effort to albacore (at least in those years when they are within range). City and Harbor District staff who manage berthing report that as recreational albacore fishing has grown in recent years, overall vessel size has increased, as more seaworthy boats are required to fish longer and further offshore. For others, the reduction in salmon fishing opportunities has led to a shift of effort toward halibut (within or outside the bay) and other less valued species.

Despite the substantial reduction in opportunities, fishing for salmon has remained a strong value and preference for Eureka's ocean anglers. However, anglers and charter operators noted that the substantial variability and uncertainty in salmon management have become increasingly frustrating. Moreover, the lack of predictability has made it difficult for charter operators to plan for and sustain their businesses.

Cumulative Effects of Regulatory Change

Over time, the increasingly stringent management of the groundfish and salmon fisheries has had cumulative impacts on the larger fishing community. Seasonal fishing activity for the commercial fleet has been curtailed. Whereas Eureka's commercial fishing community was once active year-round, the annual pattern has changed:

We have intense fishing activity going on here for two months of the year; which is December and January... the beginning ... of crab season, and there's a little dab of salmon in September. Every now and then, we get the [nonresident] tuna fleet...

Recreational fishermen also are less active through the year as their salmon and rockfish seasons have been truncated as well, and other fisheries (e.g., albacore, halibut) are dependent upon weather and species availability from year to year. For example, the small community of King Salmon had been a focal point of recreational – and some commercial – salmon fishing through the 1980s. Following salmon management restrictions of the mid-1980s and early-1990s, however, activity declined significantly. According to one long-time charter operator:

King Salmon was the sport fishing center up here; there were three trailer parks, people fished in the [Elk] river, with their fish caught and canned [by local businesses]. ... Between 1986 and 1989, there were three 50-foot charter boats, each capable of carrying 40 passengers, a 36-foot boat licensed to carry 12, and no 6-packs. 1996 was my last season with [a] big boat. ... Between 1997 and 2003, there were no charters at Eureka and only one operating out of King Salmon.

Today, two RV parks and a restaurant remain, and a handful of boats tie up along Fishermen’s Channel, but charter boats are no longer based at King Salmon and there is little other fishery-related activity there. One RV Park operator described the change in clientele from “fishing folks” to “residents looking for affordable housing.”

The number of fishery-support businesses that serve the commercial fleet has diminished over the last 30 years. According to study participants, in the late 1970s there were at least four marine supply stores, three fuel docks, and two electronics shops. As the salmon fishery contracted in the early 1980s, the Fishermen’s Marketing Association (FMA)

closed the marine supply and fuel business it had owned since the 1970s:

The FMA owned a gear store and fuel dock, Eureka Marine, started in the 1970s. ... The gear store had 500,000 gallons of diesel in fuel sales per year. Salmon closures meant that fuel sales dropped. Hardware sales weren’t enough to keep things going as they had been.

Soon afterward, Davenport Marine leased the space from the city, where it operated a gear store (which had been located in another space nearby) and the fuel dock. When Davenport Marine closed in 1995, Englund Marine bought the business and leased the site from the city. Since then, Englund Marine has run Eureka’s only waterfront commercial marine supply and fuel dock. (A second fuel dock located at EZ Landing in King Salmon is available to smaller boats.)

The recent salmon season closures have affected use patterns at Woodley Island Marina. Historically, as commercial fishermen left for summer salmon and albacore fishing, recreational fishing boats would fill their slips, benefiting the harbor, support businesses and the larger community. With the 2008 statewide closure, commercial salmon boats did not head out for the season, leaving less room for recreational boats that usually occupy those slips during the summer. At the same time, with the high cost of fuel and the larger economic downturn, as well as the constraints on recreational fishing, fewer recreational boats booked space at the marina. As a result, the marina faced an overall reduction in activity and revenues, with similar effects on local support businesses. Meanwhile, according to Harbor District staff, the harbor has become somewhat of a “storage yard for Southern California boats” during the summer because

slip fees are relatively inexpensive. Although the revenue from this use is beneficial to the Harbor District, it is of limited benefit to other businesses in the community.

Other businesses have diversified or shifted emphasis. For example, Englund Marine experienced a shift toward more recreational (salt and freshwater) business: “Ten years ago, [business] was 90% commercial [fishing]; now it’s 60% sport and 40% commercial.” With the closure of the commercial salmon fishery in 2007, several commercial (as well as recreational) fishermen participated in the recreational fishery, increasing the demand for sport fishing gear. With the renewed interest in the hagfish fishery, Englund also increased its inventory of gear for the fishery. Looking ahead to the 2008 salmon fishery closure, Englund staff reported: “This season will be nonexistent compared to last year. Salmon is about half of our business. Because we had a good year last year we bought a lot of inventory this fall – \$250,000 worth – that we will have to sit on.”

In 2008, Eureka Ice and Cold Storage closed abruptly, following years of deferred maintenance. Although not entirely due to regulatory factors, the loss of this key provider has had substantial and far-reaching impacts on fishermen, fish buyers and others in the region who relied on it for bait and product storage, and for processing. The city secured funding and built a flake-ice plant on the finger dock adjacent to the city-owned seafood processing plant operated by Pacific Choice Seafoods. The new ice plant opened in early 2010, is maintained and operated by Pacific Choice Seafood through a public/private partnership with the city, and provides ice to the local fleet and local businesses. However, the cold storage facility has not been replaced. One local fisherman commented, “I have a little trouble seeing how we can call ourselves a fishing port if we don’t have a cold storage” (Driscoll 2008).

Economic Factors

For fishing operations, costs include fixed items such as vessels, gear and equipment (for navigation, safety and maintaining the quality of the catch), slip fees, permit fees, insurance and general vessel maintenance. They also include variable (operating) costs such as fuel, ice and other provisions, as well as crew. Fish buyers and processors, support businesses, the Harbor District and the city likewise have fixed and variable costs including facilities, equipment, labor (and associated costs such as workers’ compensation), supplies, and maintenance, repair and services, which are needed to keep their operations functioning safely and effectively.

Rising costs, especially those for fuel and insurance, were cited as among the biggest challenges commercial fishermen (and other community members) are facing. According to the Pacific States Marine Fisheries Commission’s (PSMFC) annual West Coast Marine Fuel Price Survey, average pretax fuel prices at Northern California ports increased more than three-fold from \$1.00 per gallon in December 1999 (\$1.22 in 2007\$) to \$3.19 in December 2007, and about 21% between January and December 2007 (PSMFC 2000, 2008).

At the same time, many commercial fishermen commented on stagnant or declining prices in several fisheries. Our analysis of the landings data suggests this is true in the whiting trawl, shrimp trawl, crab and albacore fisheries, where average price per pound in recent years is lower (-40%, -36%, -12%, -5%, respectively) relative to the long term. However, average annual ex-vessel prices are higher in recent years relative to the long term for hook-and-line-caught rockfish (+45%), line-caught sablefish (+32%), salmon (+15%) and trawl-caught groundfish (+5%). The larger declines in the whiting and shrimp

trawl fisheries are likely due to competition in international markets. The drop in crab prices may be attributed to the substantial growth in crab production, with the majority of landings still being purchased for the lower-price cooked (rather than live) crab market. Albacore troll prices have declined slightly (-5%), despite the shift toward more (local) off-the-boat sales, which tend to afford higher ex-vessel prices for fishermen. However the bulk of the albacore landed at Eureka continues to be destined for international markets, with a lower ex-vessel price per pound.

The apparent increase in rockfish and sablefish prices suggests the influence of the fresh market for the small number of participants remaining in the fishery. The upturn in salmon prices in recent years follows a long period of decline, which is attributed to the growing supply and popularity of farmed salmon in both domestic and international markets (Sylvia et al. 1998). One study participant identified three factors that led to the increase in salmon prices: a fleet-wide increase in quality of the catch, a campaign against farmed salmon, and marketing efforts of the California Salmon Council.

Increased costs and less favorable economic conditions also have affected fishery-support businesses, both directly and indirectly. The reduction in fishing opportunities and activity also has reduced demand for goods and services provided by these support businesses. As a result, several businesses have ceased operations, while others have diversified or shifted emphasis. Through the early 1980s, four marine supply stores and four fuel docks supported local fishing activity; today, only Englund Marine remains, and serves both functions. In the late 1990s, following years of reduced use by local and out-of-town fishermen, the Fields Landing boatyard prepared to close. Unable to find a viable

tenant to run the business, the Harbor District, which owns the facility, assumed responsibility for its operation.

Infrastructure: Maintaining the Working Waterfront

Study participants highlighted the importance of fishery-support infrastructure, and discussed long-standing efforts to maintain and enhance Eureka's working waterfront. Of critical concern are fish receiving and processing facilities, ice and cold storage, and work areas and facilities for loading and unloading gear and associated activities.

Although some reduction in local receiving and processing occurred through the 1980s and 1990s, the closure of Eureka Fisheries in 2001 seems to have had a particularly strong impact on local fisheries. Having endured changes in the salmon, shrimp and groundfish fisheries, the company had long played a central role in the fishing community. In 2001, Pacific Choice Seafoods purchased most of the company's fish receiving and processing assets. The closure of Eureka Fisheries meant the loss of two receiving and processing facilities in the county, along with extensive facilities in Crescent City, and at other ports. Fields Landing was especially affected, as Eureka Fisheries accounted for nearly all of the landings there. (It also had been a major buyer at Trinidad.) Although Pacific Choice Seafoods has to some extent filled the void left by the closure of Eureka Fisheries by



concentrating its processing activity at Eureka, many study participants expressed concern about the limited competition among buyers of fish destined for processing (especially groundfish and crab), as well as the limited local processing capacity. Moreover, the use of receiving and processing facilities at Fields Landing has dropped sharply, although this has been mitigated some by live crab offloading and, in 2007, the resurgence of the hagfish fishery.

The limited availability of facilities for other receiving and processing activities is also of concern. In 1986, fire nearly destroyed Dock B, located on the mainland south of the Eureka Boat Basin. Two smaller receivers continued to receive a variety of fish there; however the dock was condemned after a 6.5 earthquake in early 2010 compromised the safety of the structure.

At least four years before the Dock B fire, the Humboldt Fishermen's Marketing Association had begun working with the City of Eureka toward the development of a Fishermen's Terminal with receiving stations to serve smaller local buyers, nonresident buyers and fishermen offloading their own catch, retail space for a fish market, office space for the Association, and waterfront work space for fishermen. The development of the Fishermen's Terminal has been a long, drawn out process. Following a series of delays the cost has more than tripled since its inception in the early 1980s (Greenson 2009). In the first phase of the project, which began in 2002, a

420-foot work dock and four jib hoists were installed. Initially, their use was limited⁴²; however three of the hoists were replaced with more appropriate fish hoists in August 2008, and are now in use. In 2007, the city secured a loan, and in late 2009, received federal stimulus funds to help with completion of the project; work began in 2010.

Finally, study participants spoke to the importance of regular dredging of Humboldt Bay's entrance bar and navigation channels to insure safe navigation of all vessels. Because of Humboldt Bay's status as a port with a long history of commerce, the entrance bar and navigation channels are regularly dredged. However, issues have arisen, as occurred during the 1997–1998 El Niño, when one million cubic yards filled the channel at the tip of the south jetty (compared to 600–700,000 cubic yards in other years; Driscoll 2002). In April 2000, the Harbor District (as local sponsor) and the U.S. Army Corps of Engineers completed a harbor bar and entrance channel deepening project to address such issues and improve safety. Periodic dredging of the bay's marinas, the responsibility of local authorities, is necessary as well. In late 2005 just before the start of crab season, fishing boats had trouble getting in and out of their slips at both the city and Harbor District marinas, and dredging permits were delayed pending further water quality review by the California Coastal Commission (Driscoll 2005a, b). The last full dredging occurred in 2007.

CURRENT SITUATION AND OUTLOOK

Eureka area fisheries have changed markedly over the past three decades. Expansion through the 1970s and early 1980s was followed by contraction as regulatory, economic and other factors played out during the 1990s and into the 2000s. Commercial fishery participants (about 100 boats and crew, two major receiver/processors and two local buyers with receiving stations) have become particularly dependent on crab, although groundfish, albacore and other fisheries continue to play a role. Recreational fisheries have shifted from a primary focus on salmon to albacore, groundfish, halibut and crab, even as salmon remains a highly valued fishery for anglers as well as commercial fishermen.

Receiving and processing capacity have contracted geographically and become consolidated. Where multiple providers of goods and services (e.g., marine supply, fuel dock, vessel maintenance and repair) once were needed to meet local demand, only one or two of each type remain, serving communities elsewhere along the North Coast and beyond, as well as Eureka.

While this consolidation suggests increased efficiency, the small number of goods and service providers increases the local fishing community's vulnerability to further regulatory, economic and environmental

change. The abrupt closure of Eureka Ice and Cold Storage in 2008 is a reminder of that vulnerability. The closure of Eureka Ice also highlighted the importance of Eureka's fishery-support businesses to the operation of other North Coast fishing communities.

The fishing community has long been concerned about maintaining Eureka's working waterfront infrastructure, both for the functionality of the fleet and to preserve the area's maritime heritage. One fisherman noted, *"the value to this community of the fishing industry here... (it's) in people's hearts; commercial fishing represents their sense of place."* More than 30 years after the idea of a Fishermen's Terminal was introduced to help meet these needs, the first phase of the project was completed in 2006, and the second and final phase is taking shape.

At the same time, study participants are concerned about recent and pending events in the larger policy arena that may undercut the viability of the Fishermen's Terminal project and the fishing community more generally. They expressed substantial concern about the potential cumulative impacts of new MPAs together with other fishery management, potential offshore energy development, and the pending individual quota (IQ) program for the groundfish trawl fishery. The MLPA process is of concern to the larger community as well because of the potential economic and social implications for the city and the county. In response, the Harbor District facilitated the formation of the "North Coast Local Interest MPA Work Group" to coordinate input and activities related to the MLPA process (Higgins 2009). Recent efforts by Pacific Gas and Electric to establish a wave energy pilot project in state waters just north of the Humboldt Bay



harbor entrance have added to fishing and larger community concerns about access to marine resources and safety, among others.⁴³ Finally, there is considerable uncertainty regarding the outcome of the pending (IQ) for the federal groundfish trawl fishery, which is “intended to increase economic efficiency within the fishery and reduce the incidental catch of overfished groundfish species” (PFMC and NMFS 2010). Some fishery participants have expressed concerns that limited initial quota allocations for nontarget species will substantially reduce their fishing activity, with negative economic impacts on their operations and the community.

Despite these challenges, the Eureka fishing community is strengthened by the political will of its citizens and leaders, and existing and future infrastructure such as two well-maintained harbors, a boatyard and fuel station, and the developing Fishermen’s Terminal. These features lend the Eureka fishing community a degree of resilience that may enable it to effectively address the challenges and opportunities that lie ahead.



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ENDNOTES

- ¹ The bay historically covered 27,000 acres; today it covers 13,000 acres, following diking, drainage and filling (Norman et al. 2007).
- ² The port can accommodate vessels up to 950 feet length (HBHRCD 2007a).
- ³ Historically, fishermen also targeted coho (*Oncorhynchus kisutch*) salmon, however retention has been prohibited since the early 1990s.
- ⁴ Aquaculture and both tribal and nontribal shore-based ocean, inland and river fisheries, clam digging and other collecting activities are also important to the community and the region, but are beyond the scope of this report.
- ⁵ See Appendix C for methodological detail.
- ⁶ In the 1800s, shark liver oil was valued for a variety of medicinal purposes. The fishery reemerged during World War II following the discovery that shark livers contained high-potency vitamin A. When a synthetic form was produced in the 1950s, the market for shark livers collapsed.
- ⁷ See <http://ceo.ucsd.edu/fishbull/>, accessed 10/28/09.
- ⁸ Hoopes (1969) estimated employment by company as follows: Eureka Fisheries, 625; A. Paladini, 150; Tom Lazio, 340; Coast Oyster, 50; and Humboldt Seafoods, Inc., 145.
- ⁹ State regulations have prohibited the use of trawl nets since 1917 (Scofield 1948) and the commercial take of salmon and crabs within Humboldt Bay since at least 1973 (Monroe *et al.* 1973), and have limited catch in the anchovy bait fishery since 1971 (Warner 1982).
- ¹⁰ The KMZ extends from Humbug Mountain near Port Orford, Oregon to Horse Mountain in southern Humboldt County.
- ¹¹ Regulations have generally been more restrictive in the California KMZ than in the Oregon KMZ, reflecting somewhat different policies regarding how much fishing opportunity each state is willing to forego in the KMZ to maintain opportunity in other areas.
- ¹² See Appendix B for a glossary with definitions of this and other key terms used throughout this report.
- ¹³ The tribal allocation was upheld in *Parravano v. Babbitt*, 70 F.3d 539 (9th Cir. 1995), cert. denied, 518 US. 1016 (1996).
- ¹⁴ See Ralston (2002) for a discussion of the biology of West Coast groundfish and how growing understanding of that biology affected PFMC management.
- ¹⁵ Pacific ocean perch, bocaccio and lingcod were declared overfished in 1999, canary rockfish and cowcod in 2000; darkblotched and widow rockfish in 2001; and yelloweye rockfish in 2002. Lingcod was declared rebuilt in 2005.

- ¹⁶ Vessel monitoring systems are electronic transmitters placed on fishing vessels that transmit information about a vessel's position to enforcement agencies via satellite to determine, for example, whether a vessel is in a closed area (<http://www.pcouncil.org/groundfish/gfvms.html>, accessed 12/7/09).
- ¹⁷ California Code of Regulations, 2008. Title 14, Sections 120.1 and 120.2
- ¹⁸ http://www.dfg.ca.gov/licensing/pdffiles/cf_items_10yr.pdf, accessed 6/21/10
- ¹⁹ <http://www.oysters.us/french-terms.html>, accessed 7/30/10.
- ²⁰ According to a local grower, over 99% of Humboldt Bay bivalve landings are farmed product originating from larvae supplied by hatcheries in Oregon, Washington and Hawaii.
- ²¹ See Leet et al. 2001 and Starr et al. 2002 for descriptions of these fisheries and gear types.
- ²² Although the trawl fishery for whiting is managed under the Groundfish FMP, it is a distinct fishery in many respects, and is discussed separately.
- ²³ Throughout we abbreviate the names of these fisheries as follows: albacore for albacore troll, crab for crab pot, rockfish for rockfish/lingcod hook-and-line/pot, sablefish for sablefish hook-and-line/pot, and salmon for salmon troll.
- ²⁴ Off-the-boat sales have been allowed at the Eureka Boat Basin for several years (Driscoll 2001). At Woodley Island Marina, off-the-boat sales have been allowed for finfish since 1998, and for crab since 2001.
- ²⁵ According to the local live bait provider, Humboldt Bay is the only location between Santa Cruz and Westport, Washington that the fleet can buy or catch live bait. He reported supplying a total of about 32,000 pounds of live anchovy to several recreational and 24 commercial albacore boats in 2009. Nonlocal bait suppliers noted by study participants include Katy's Smokehouse in Trinidad, Sea Wave (Monterey Fish Company) in Monterey and Mike's Baits, Bait in Oregon.
- ²⁶ <http://www.trawl.org/Member%20Boats.html>, accessed 1/10/10.
- ²⁷ <http://wfoa-tuna.org/members/members010510.pdf>, accessed 1/10/10.
- ²⁸ The organization has gone by different names over time including the Humboldt Fishermen's Wives Association, and Humboldt Women for Commercial Fishing.
- ²⁹ The 1981 start date for this analysis is based on the availability the Pacific States Marine Fisheries Commission's PacFIN database, which integrates Washington, Oregon and California commercial fishery landings data to provide a consistent coast-wide electronic record of landings from 1981 forward. The PacFIN data for California are based on the C-MASTER data provided by CDFG to the PacFIN program.
- ³⁰ An entity is counted as a buyer in a given year if it receives at least one delivery. In reality, the number of active buyers capable of regularly receiving the catch from multiple boats is considerably smaller.

- ³¹ Because multiple species may be caught during a fishing trip, trips are measured by assigning each delivery to the fishery accounting for the greatest (i.e., plurality of) ex-vessel value associated with that delivery. In some cases, fishing for particular combinations of species and/or using multiple gear types on a single trip is prohibited.
- ³² Consolidation refers to the concentration of fish catch or fish receiving among a smaller number of entities.
- ³³ Note that crab season straddles the calendar year (December through July), and most landings occur within the first one to two months of the season (Hankin et al. 2001). As a result, activity reported for a given year may not correspond to that of a season, *per se*. We analyzed the data by calendar year for consistency with analyses for other fisheries, most of which have seasons that lie within the calendar year.
- ³⁴ Commercial salmon troll data exclude landings at King Salmon and other Humboldt Bay sites because these are reported in PacFIN as part of, and not distinguishable from, ‘Other Humboldt County’ data.
- ³⁵ Community members also highlighted local dock (offloading) fees and container weight limits on California Highway 101 as deterrents to offloading albacore frozen at sea.
- ³⁶ Port-specific catch and effort estimates for these species are not available.
- ³⁷ Initiated by the state in 2004, the CRFS provides comprehensive estimates of effort and catch for all recreational fishing modes and species. (Modes are the locations/facilities anglers fish from, and include: manmade structures, beaches and banks, CPFVs or charter boats, and private boats.)
- ³⁸ The 1980 start date for this analysis is based on the availability of electronic CDFG logbook data.
- ³⁹ See the *Trinidad Harbor Fishing Community Profile*.
- ⁴⁰ ‘Boats’ are counted as the number of unique vessels that operate in a given year. A ‘boat trip’ represents a combined departure and return of a boat, regardless of trip length. An ‘angler trip’ is defined as one angler spending part or all of one or more days fishing before returning to the location where the trip began. An ‘angler day’ is defined as one person’s fishing on a given day. For example, two anglers each fishing for three days are counted as six angler days.
- ⁴¹ Permit holders in seven fisheries (i.e., the federal groundfish and the Washington, Oregon, and California pink shrimp and Dungeness crab fisheries) participated in the referendum. The vote, weighted by debt obligation on the buyback loan for each fishery (as prescribed by the statute), was 85.5% in favor of the buyback, including 90% of the trawl, 80% of the pink shrimp, and 55% of the crab fleets (Deweese 2003).
- ⁴² Fishing community members noted that the jib hoists were not ideal for fishery use and were expensive to operate, and that the facility lacked bumpers to protect docking boats.
- ⁴³ See <http://www.pge.com/about/environment/pge/cleanenergy/waveconnect/projects.shtml> (accessed 6/30/10) for information about the Humboldt WaveConnect™ Pilot Project.

Fort Bragg/Noyo Harbor Fishing Community Profile



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EXECUTIVE SUMMARY

Background

National Standard 8 of the Magnuson-Stevens Fishery Conservation and Management Act requires that fishery managers consider the importance of fishery resources to fishing communities, to provide for their sustained participation and to minimize adverse economic impacts on them, consistent with conservation objectives. Similarly, California's Marine Life Management Act mandates the use of socioeconomic as well as biophysical Essential Fishery Information to meet fishery management goals. Information on how individual fisheries and port communities operate is important to meeting these mandates. Yet, such social science information on Northern California port communities has been sparse until recently.

This profile of the Noyo fishing community describes the history of the area and its fisheries, present-day fishery operations, activities and associated infrastructure. It identifies key regulatory and economic factors highlighted by study participants that interact with and affect the local fishing community. It is intended for use in a range of processes, from local planning and education to state and regional management.

The information presented is based on the collection and integrated analysis of archival and field data to interpret patterns, variability and change within and across fisheries and the fishing community over time. Data sources include:

- Commercial fish landing receipt data for 1981–2007 reconfigured into 34 distinct species/gear combinations;

- Commercial Passenger Fishing Vessel (CPFV) logbook data for 1980–2007;
- An extensive review of the published and gray literature, including fishery status reports and historical fishery statistics (as available); and
- Field observation and interviews and group meetings with about 40 fishery participants and other knowledgeable individuals.

History of the Noyo Fishing Community

Located 170 miles north of San Francisco, Noyo Harbor and the adjacent city of Fort Bragg are situated near highly productive fishing grounds for salmon, groundfish, urchin, crab, abalone and shrimp. People living in this remote part of the state have long utilized fishery resources for livelihood, sport and subsistence. Originally inhabited by the Pomo Indians, Fort Bragg was developed as a logging town in the late 1800s, soon after the establishment of the first sawmill on California's North Coast at the mouth of the Noyo River. Fishing followed soon after, with the establishment of fisheries for salmon, rockfish, lingcod and halibut. The timber and fishing industries grew through the 1900s. In 1950, the Noyo Harbor District was established, and in the 1960s, both the Noyo Harbor mooring basin and the privately owned Dolphin Isle Marina, located about a half mile up the Noyo River, opened, offering a range of facilities, goods and services to support growing and increasingly diverse commercial and recreational fisheries.

By the late 1970s and 1980s, growing concerns about the status of West Coast salmon and groundfish stocks prompted the Pacific Fishery Management Council (PFMC) and the state of California to implement increasingly stringent

management measures for the commercial and recreational fisheries. Cumulatively, these measures have discouraged (nontribal) fishing along much of the North Coast, resulting in substantial reductions in both commercial and recreational fishing activity, and contributing to social and economic impacts in the area.

The Noyo Fishing Community Today

Noyo's primary commercial fisheries include the groundfish trawl, urchin dive, Chinook salmon troll, Dungeness crab pot, and sablefish and rockfish/lingcod hook-and-line and trap fisheries. Some resident fishermen travel north into Oregon or south (as far as San Francisco) to participate in the Chinook salmon, albacore tuna and/or crab fisheries. Although most resident fishermen participate in more than one fishery, locals describe the approximately 80-vessel fleet as including 30–40 salmon trollers, 15–20 multi-fishery vessels, 10–15 urchin dive boats and seven groundfish trawlers.

Local fish receiving and processing capacity consists of six buyers with receiving stations at the harbor, including three on-site receiver/processors and a live fish buyer. Caito Fisheries is the primary receiver and processor of groundfish, crab and salmon. Sea urchin is received and processed by Pacific Rim Seafoods and by Ocean Fresh Seafoods, which also receives fish for several out-of-area buyers. Much of the catch is processed locally; however, some of it is shipped out of the area for processing as well as distribution. Some buyers and fishermen (through off-the-boat and other direct sales) sell small amounts of salmon, crab, groundfish and albacore seasonally.

Following the reduction in recreational salmon fishing opportunities beginning in the early 1990s and more recent groundfish restrictions,

participation in ocean recreational fishing at Noyo has declined. Today, the most avid anglers pursue an annual round of fisheries that includes salmon (when the season is open), albacore in late summer (when it is within range), abalone (late spring through fall) crab in winter, and rockfish year-round (subject to closure when quotas have been reached). Private boat fishing continues to be the primary recreational fishing mode. Noyo has five active charter operations, which carry between 6 and 40 passengers.

The harbor district, Dolphin Isle Marina and approximately 25 businesses at or near the harbor (and more in the larger region) provide considerable infrastructure, goods and services to support fishing activities. Harbor infrastructure consists of a 240-slip boat basin with service facilities, a work hoist (fish offloading is prohibited), two launch ramps, a fuel dock, parking and storage areas. Dolphin Isle Marina provides 150 slips, RV spaces, a fuel dock, a café and store and a fish-cleaning station. Although their number and scope has diminished in recent years, local support businesses provide goods and services from fuel and ice to refrigeration, vessel repair and maintenance, which address many but not all fishery needs.

Commercial Fishing Activity Highlights

Relative to the long term (1981–2007), average annual total fishing activity has decreased in recent years (2003–2007) in terms of landings (-52%), ex-vessel value (-31%), boats (-44%) and trips (-54%), while buyers have increased (+15%).

- The groundfish trawl fishery, active at Noyo since the 1930s, accounted for 58% of landings and 37% of ex-vessel value for the long term, and 48% of landings and 24% of ex-vessel value in recent

years. However, the fishery has undergone significant decline, with all measures (except price per pound) 50%–69% lower in recent years relative to the long term.

- The urchin dive fishery, which began in earnest in the mid-1980s, peaked in 1988 when 17.9 million pounds worth nearly \$8 million were landed, then declined substantially. Activity on all measures is down 53%–84% in recent years compared to the long term, due largely to changing environmental and market conditions. However, more recent changes in those conditions have led to a resurgence of the fishery.
- The salmon troll fishery is among the port's top three fisheries, accounting for 7% of landings and 22% of ex-vessel value over the long term, increasing to 19% of landings and 41% of ex-vessel value in recent years. Although the absolute number of boats participating in the fishery has declined (-41%), the proportion of vessels at Noyo Harbor that landed salmon increased to 73% in recent years from 62% for the long term. In contrast to many other fisheries, salmon troll landings and ex-vessel value are greater (52% and 20%, respectively) in recent years.
- Activity in the Dungeness crab fishery is modest compared to other ports, in part due to the fact that several local fishermen target grounds nearer other ports (where crab are more abundant), where they deliver most of their catch. Nonetheless, activity in the fishery has increased since the mid-1990s, with landings and ex-vessel value, respectively, 70% and 46% higher in recent years compared to the long term.
- The sablefish hook-and-line/pot fishery ranks among Noyo's top five fisheries on most measures, with recent activity greater in terms of landings (+3%), ex-vessel value (+26%), boats (+42%), trips (+14%) compared to the long term.

- The rockfish/lingcod hook-and-line/pot fishery accounted on average for less than 5% of landings and ex-vessel value, with an average of 20% of boats participating during the period 1981–2007. Activity in recent years is 74%–88% lower in terms of landings, ex-vessel value and boats, and 31%–39% lower in terms of buyers and trips. However, average annual price per pound is 57% greater in recent years, due in large part to the growth of the live fish market since the mid-1990s.

Total landings and ex-vessel value (for all fisheries) peaked at 32.2 million pounds and \$30.6 million in 1988, with urchin accounting for 56% of landings and salmon accounting for 43% of ex-vessel value. In 2007, 5.3 million pounds worth \$6.5 million was landed at the port, with groundfish accounting for the highest proportion of landings (53%) and value (29%).

The number of boats peaked in 1988, when 968 boats made 20,638 deliveries, 64% of which were salmon and 16% of which were urchin. Vessel participation was lowest in 1998, when 175 boats made 3,520 deliveries, 37% of which were urchin and 22% of which were rockfish/lingcod. In 2007, 242 boats made 2,535 deliveries, 31% of which were salmon, and 20% of which were urchin.

Revenue concentration among buyers has varied. During the 1998–2000 and 2003–2005 periods, 22%–27% of buyers accounted for 90% of the landed value. Revenue concentration was higher in 2001 and 2002 and again in 2006 and 2007, when 15%–19% of buyers accounted for 90% of landed value at Noyo.

Of the 42 buyers that received commercially-caught seafood landed at Noyo Harbor in 2007, at least five were locally-based nonfisherman

businesses, at least four were local fishermen, and 19 were fishermen and smaller receiving operations based in other locations in California, and in Oregon and Washington.

Average annual ex-vessel price per pound was lower in recent years relative to the long term in the urchin (-54%) and crab (-16%) fisheries, and were higher in the rockfish (+58%), sablefish (+23%), albacore (+18%), salmon (+12%) and groundfish trawl (+8%) fisheries.

The number of ‘Noyo Harbor boats’ (i.e., those with a plurality of their ex-vessel revenue at Noyo) declined from an average of 462 per year from 1981 through 1983 to 138 from 1993 through 1995, and 113 from 2005 through 2007, while average revenue per boat increased from \$25,499 to \$67,454 between the first two periods, then declined to \$52,601 for the most recent period. When boats were assigned to their primary fishery (the fishery accounting for the plurality of each vessel’s landed value), this same pattern was apparent in the groundfish trawl, urchin dive and rockfish fisheries, while salmon boats followed the opposite pattern. The only consistent trends observed were among crab boats, which experienced a consistent increase in revenue, and sablefish boats, which experiences a consistent decrease in revenue across the three periods. It is not clear, however, how these changes in revenue per boat compare to costs, which have generally increased over time.

Recreational Fishing Activity

Recreational fishery data specific to Fort Bragg are limited.

- According to the California Department of Fish and Game’s (CDFG) California Recreational Fisheries Survey, which provides data on fishing activity at the ‘district’ level, an annual average of

130,000 angler trips were made in the Wine District (Mendocino County) between 2005 and 2007. About 52% of these trips were from private boats, and 4% from charter boats.

- CDFG CPFV logbook data for Fort Bragg indicate no change in the average number of CPFVs (8), a 54% increase in the number of boat trips, and a 44% increase in the number of angler trips in recent years (2003–2007) compared to the long term (1980–2007).

Key Factors Affecting Noyo Harbor Fisheries

Salmon fishery management: The Noyo fishing community has been affected by variable and generally reduced access to salmon (Chinook and coho), especially since the late 1980s. The state’s implementation of limited entry coupled with severe weather and poor fishing conditions in the early 1980s led to a sharp drop in salmon fishery activity at Noyo. However, as fishing in the KMZ to the north was sharply curtailed, commercial fishing activity in Fort Bragg increased through the 1980s, peaking in 1988. As with the commercial fishery, the recreational ocean salmon season in the Fort Bragg area was largely unchanged during this period, and fishery-support businesses at Noyo and in Fort Bragg that catered to commercial and recreational salmon fishermen benefited. Reduced allocations to nontribal fisheries in the early 1990s led to sharp reductions in commercial fishing opportunities, which adversely affected local support businesses such as marine supply stores and fuel docks. During the early 2000s, the commercial salmon fishery rebounded some. However, the commercial season in 2006, 2008 and 2009 and the recreational season in 2008 and 2009 have been minimal to nonexistent, with profound effects on the community.

Groundfish fishery management:

Increasingly strict federal catch limits since the 1990s, together with the 2003 federal groundfish trawl buyback and the state's implementation of restricted access in the Nearshore Fishery, have limited commercial fishery participation. Of 12 resident groundfish trawlers, seven participated in the 2003 groundfish trawl buyback. Their removal from the local fleet led to a marked reduction in local fishery activity, including seafood processing and the use of fuel, ice and other support services. Recent time and area closures to protect yelloweye rockfish, coupled with the 2008 salmon closure (after an initial 45-day opener off Fort Bragg) and the limited (10-day) 2009 salmon season, eliminated many local recreational fishing opportunities, further straining local support businesses and negatively affected the community's sense of well-being.

Economics: Commercial fishery participants and support businesses cited rising operating costs, especially those for fuel, gear, vessel maintenance and insurance. At the same time, many commercial fishermen commented on stagnant or declining prices in several fisheries. Price trends have varied among fisheries – declining in fisheries such as urchin and crab and increasing in others such as salmon, rockfish and sablefish. Similarly, trends in average annual revenue per boat have varied among fisheries. Increasing costs and less favorable economic conditions also have affected fishery-support businesses, both directly and indirectly. The reduction in fishing opportunities and activity has resulted in reduced demand for goods and services that these businesses provide.

Harbor Infrastructure: As fishing activity has declined over the last 30 years, so has the harbor's revenue base, making it difficult maintain and improve infrastructure, while

costs, particularly for dredging and dredge material disposal, have become significant for both the harbor district and Dolphin Isle Marina. Use of other infrastructure, including receiving stations, fuel docks and the ice plant, which are privately owned, has declined as well, leading to reductions in the number and types of support businesses. Many study participants expressed concern about the vulnerability of local infrastructure to further declines, noting that the viability of local fisheries and the fishing community depends on a certain level and diversity of activity. Without access to these and other fundamental services, continuing to fish from Noyo may become untenable.

Current Situation and Outlook

Following reduced opportunities in the salmon and groundfish fisheries and other regulatory and economic events, a smaller fleet of commercial fishermen and a much-reduced number of resident receivers, processors and fishery-support businesses remain active at Noyo. Once dominated by commercial fishing, the harbor is more dependent on the recreational sector. However, the narrowed range of fishing options and the recent economic downturn have deterred some nonresident anglers from visiting. Although sport fisheries for groundfish, crab and abalone continue, they have not filled the void left by salmon.

With only a core group of support businesses remaining, fishery participants are concerned about the potential for further loss of infrastructure, and its implications for the viability of local fisheries and the fishing community. The need for dredging is acute for fishermen and for others who depend on Noyo for provisions, services and refuge from often dangerous ocean conditions along this isolated stretch of the North Coast.

Study participants also are concerned about recent and pending events in the larger policy arena including the North Coast Marine Life Protection Act process, begun in late 2009, the individual quota program for the federal groundfish trawl fishery, to be implemented in 2011, and potential offshore energy development, which have the potential to

fundamentally change local fisheries and the community.

Taken together, these issues pose serious challenges to the viability of the Noyo fishing community. Yet they also have motivated individuals, families and businesses to identify opportunities for sustaining their livelihoods and heritage.



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Cover photo by C. Pomeroy.

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INTRODUCTION

Fort Bragg is located along a remote section of the Northern California coast, approximately 170 miles north of San Francisco and 135 miles south of Eureka (Figure 1). Separated from the interior by the rugged North Coast Range, with only two minor highways (Highways 1 and 20) connecting residents with the outside world, Mendocino County's coastal communities historically have been, and still very much are, resource-dependent.¹ Since the early 19th century, logging and the manufacturing of timber along with fishing (sport and commercial) have been the basis for Fort Bragg's social and economic growth. According to Gross (1982), the fishing industry involved as much as one quarter of the labor force in Fort Bragg. In recent decades, tourism and agriculture have increased, helping to offset declines in timber production and fisheries.

Noyo Harbor, located along the Noyo River just south of Fort Bragg, is the center of fishing activity in the area. Established around the turn of the 20th century, it is the only port of refuge between Bodega Bay and Eureka, a stretch of some 300 miles. Severe weather is common along this part of the North Coast, often

limiting the number of days one can fish safely, and the harbor entrance can be extremely dangerous. Yet the proximity and consistently high quality of fishing grounds, the location and services at the harbor, and other features have long appealed to fishermen.

The port thrived on salmon for the better part of the last century, supporting both residential and transient commercial fleets as well as recreational fishermen and charter businesses. In addition to salmon [Chinook (*Oncorynchis tshawytscha*) and historically, coho (*Oncorhynchus kisutch*)], Noyo's commercial fisheries include groundfish (various flatfish, roundfish and rockfish, *Sebastes* spp), red sea urchin (*Strongylocentrotus franciscanus*), Dungeness crab (*Cancer magister*), and occasionally albacore tuna (*Thunnus alalunga*). Other fisheries such as ocean (pink) shrimp (*Pandalus jordani*) have occurred from time to time. Recreational anglers target abalone (*Haliotis rufescens*), salmon, rockfish and other nearshore species such as lingcod (*Ophiodon elongatus*), crab and occasionally albacore.



Figure 1. Maps of Fort Bragg, indicating location on the California coast, and Noyo Harbor and Dolphin Isle Marina.

This profile provides an historic and contemporary description of the Noyo Harbor fishing community, focusing on the development of fisheries and related infrastructure, with particular emphasis on the period 1981–2007 (for which detailed landings data are available). We describe present-day fishery operations, activities and associated infrastructure, and discuss some of the key regulatory and economic factors highlighted by study participants that interact with the local fishing community.

The information presented here is based on archival and field research conducted between July 2007 and March 2009.² Fieldwork included observation, informal and formal interviews and five group meetings. These activities engaged approximately 40 people, including 19 local commercial and recreational fishermen, seven fish buyers, owners and employees of eight fishery-support businesses, managers of Noyo Harbor and Dolphin Isle Marina, as well as other community members who have experience and knowledge of local fisheries. Field data were analyzed together with commercial fishery landings data from the Pacific Fisheries Information Network (PacFIN) database, recreational fishery data from the California Recreational Fisheries Survey (CRFS) and Commercial Passenger Fishing Vessel (CPFV) logbooks, and information from other primary and secondary sources, to interpret patterns, variability and change within and across fisheries and the fishing community over time.

History of the Port and the Surrounding Area

The Fort Bragg area was originally inhabited by the Pomo Indians, who had a settlement on the Noyo River (Norman et al. 2007). Their first contact with Europeans was with fur traders in the early 1800s, but with the gold rush of the early 1850s, settlers came to stay.

The first sawmill on California's North Coast was built at the mouth of the Noyo River in 1852 (McEvoy 1986). Violent clashes between settlers and the Native American residents motivated the U.S. government to establish the Mendocino Indian Reservation in 1856, a 25,000-acre area between the Noyo and Ten Mile Rivers. The Fort Bragg military outpost was built shortly thereafter to protect the native residents from encroaching settlers, but was abandoned in 1864 when troops were ordered south. In 1866, the Mendocino Indian Reservation was opened for (nontribal) settlement (Hart 1965 in Norman et al. 2007). Many parcels of land with creeks were sought to build mills for the burgeoning timber trade.

The timber industry and the town itself grew substantially after the Union Lumber Company arrived in the area around 1885. The company established a large mill operation employing hundreds of people, planned city infrastructure, and partnered with steamship companies and railroads to export forest products and bring in supplies for the growing community (Norman et al. 2007). The City of Fort Bragg was incorporated in 1889. The first railroad connecting the area with the rest of the state came into service in 1912, with a line going 35 miles inland to the town of Willits.

Expanding activity in the commercial salmon and groundfish fisheries, as well as the growth of the sport fleet, created the need for an adequate harbor and berthing facilities. Access into and out of the river mouth was limited by the narrow, shallow channel and weather conditions, which could cause dangerous waves to break across the bar. In 1924, the first federally funded improvements were made to Noyo Harbor (Bottin 1988). Jetties were constructed on either side of the main channel and hazardous rocks were removed, allowing fishermen to safely and effectively navigate the harbor entrance (Ponts 1965). Further

Noyo Harbor Fishing Community Timeline

1800s	Pomo Indians' first contact with European-Americans
1850s	Gold rush: European-American settlement begins
1852	First sawmill at mouth of Noyo River
1857	Fort Bragg military outpost founded
1880s	Timber development booms
1889	City of Fort Bragg incorporated
1898	Start of commercial salmon fishery at Noyo
1912	Railroad extends to Willits Fish shipped to San Francisco markets
1913	Paladini begins receiving salmon at Noyo
1920s	First motorized trollers Salmon canneries established along Noyo River
1931	First federal dredging of Noyo Channel
1940s	Seafood companies established
1948	Highway 1 high-span bridge built
1950	Noyo Harbor District established
1953	Salmon Trollers Marketing Association established
1960s	Dolphin Isle Marina & RV Park opens
1968	Noyo boat basin opens
1976	Magnuson-Stevens Fishery Conservation and Management Act (MSA)
1977	Caito Fisheries opens plant
1982	Salmon limited entry Harbor Ice plant opens
1983	North Coast sea urchin fishery begins
1984	Dolphin Isle Marina expanded
1985	Ocean Fresh Seafoods opens
1988	Record year for commercial fishing activity at Noyo
1992	Moratorium on entry into the Dungeness crab fishery
1993	Salmon re-allocation to tribes (50%) Coho retention prohibited in commercial fishery
1994	Groundfish limited entry
1995	Dungeness crab limited entry Salmon disaster Coho retention prohibited in recreational fishery
1996	Sustainable Fisheries Act (MSA re-authorized)
1998	Marine Life and Nearshore Fishery Management Acts
1999	Marine Life Protection Act (MLPA) Pacific Rim Seafood opens
2000	West Coast groundfish disaster
2002	Nearshore FMP adopted First federal Rockfish Conservation Area established Georgia Pacific Lumber ceases operations
2003	West Coast groundfish trawl buybacks
2006	Klamath salmon disaster
2008	Statewide salmon disaster and fishery closure (after 45 days open at Fort Bragg) In-season sport rockfish closure
2009	Statewide salmon disaster and fishery closure North Coast MLPA process begins

improvements were made through the years, including dredging of navigation channels that extended upstream of the mouth by 0.6 miles (Bottin 1988). Major improvements to the Highway 1 bridge were completed in 1948, when a high-span bridge over Noyo Cove replaced the upriver road crossing.

Noyo Harbor District was established in 1950. The U.S. Coast Guard Station Noyo River was established later in the decade the 1950s (and moved to its current location in the harbor in 1994). Further improvements to the harbor were initiated through the 1962 Rivers and Harbors Act, which led to funding for the construction of the 240-berth mooring basin and associated facilities, which opened in October 1968.³ Dolphin Isle Marina, located less than a mile upriver, was built in the early 1960s by a private landowner.

History of Noyo Harbor Fisheries

The Establishment of Commercial and Recreational Fisheries

According to Pons (1965) and Stebbins (1986), commercial fishing at Noyo began in the 1890s with a few men fishing from rowboats to catch silver (coho) salmon, rockfish, lingcod and halibut. They would sell their fresh fish from a horse-drawn wagon in town, with river salmon selling for \$0.25 a fish. In 1898, a Finnish fisherman caught the first king (Chinook) salmon in the area.

Over the next several years, the number of fishermen selling local salmon increased, creating an oversupply of product, especially given that a market had yet to be developed (due in part to the limited transportation options). Hearing word of the abundant resources in the area, Achille Paladini (who at the time was expanding his fish company in San Francisco) arranged market orders with a small group of fishermen for the 1913 season

to buy and ship their salmon (dressed, in iced boxes) via the new rail line to Willits, and then from Willits to San Francisco. Soon afterward, Paladini opened a receiving and processing operation at Noyo, the first to process and ship fish to outside markets. Following Paladini's lead and in response to increased demand and higher prices associated with World War I, the Columbia Northern Fishing and Packing Company built a mild curing⁴ and cold storage plant in 1915, and the Small and Uri Company built a salmon cannery in 1916 (Pons 1965). The California Western Fish Company (later Caito Fisheries) also started receiving salmon around this time. According to LeBaron (1992), during the period 1917–1920, “there were 300 to 400 boats operating out of the Noyo River during the summer months.”

In a 1992 interview, Louis Cavallini, who was raised by pioneering fishermen in Fort Bragg and later managed the Paladini Plant, reported “Out of Noyo they started dragging in the 1920s, but the big boats [trawlers from San Francisco] didn't come in until they built the jetties in 1931” (LeBaron 1992). Cavallini described how trawling for groundfish in the fall and winter gave local fishermen and buyers something to target outside of the salmon season. Starting around 1939, a fishery for soupfin shark, whose livers were sought for vitamin A, exploded. Prices went from \$0.85 per pound in 1939 to \$14 per pound in 1945 (\$10.12 to \$131.58 in 2007\$) before a synthetic alternative was developed, and the fishery ended (Femling 1984). However, many fishermen and processors profited handsomely, and their investments in bigger boats, materials and technology (e.g., nylon nets, radar) that became available following World War II furthered the expansion of local fisheries. Boat building also expanded at Fort Bragg. According to Pons (1965), the first boat building operation was established by Fred Lankola in 1925. The United Fish Company

ran another boatbuilding company until 1951, then was bought by local fish plant operator Bill Grader.⁵ In 1940, the Makela brothers began crafting wooden boats. (Howard, the son of one of the brothers, continues the business to this day.) Paul Lackey, a local fisherman, also built boats in the 1960s, and was the first to build steel boats at Fort Bragg. Many years later, Chris Van Peer established a business building larger steel boats for customers from California to Alaska.

Through the 1950s and 1960s, the salmon fishery was the main focus of commercial activity. Several more fish companies moved to Noyo Harbor, setting up buying stations, canneries or processing plants along the river. According to Potts (1965), these included the F. Alioto (1943), Meredith (1948), Grader (1951), and California Shell (1962) fish companies. Landings of salmon (coho and Chinook) averaged 1.3 million pounds per year (worth \$2.8 million, 2007\$) from 1951 to 1960 (Figure 2). Many of these companies

also bought groundfish from trawl and set line fishermen, with much of the catch trucked to San Francisco for processing (Stebbins 1986). Groundfish catches during that time averaged 4.4 million pounds worth \$1.6 million. The albacore and Dungeness crab fisheries played a lesser role, but nonetheless contributed to activity at the port.

An active sport fishery developed following the commercial salmon fishery, with nonresident participation encouraged by the growth of automobile travel in the 1950s and 1960s. Historic data on recreational finfish catches for 1947–1967 indicate the growth of recreational salmon and groundfish fishing activity in the Fort Bragg area (including Albion and Point Arena) beginning in 1952, with anglers landing some 5,000 salmon and 1,000 groundfish in 1956 (Young 1969). Fishing effort varied widely with 12–3,374 angler days reported in the 1950s, and 837–4,193 angler days reported in the 1960s.⁶ Sportsmen’s Dock and RV Park was constructed in 1954 near the river mouth on

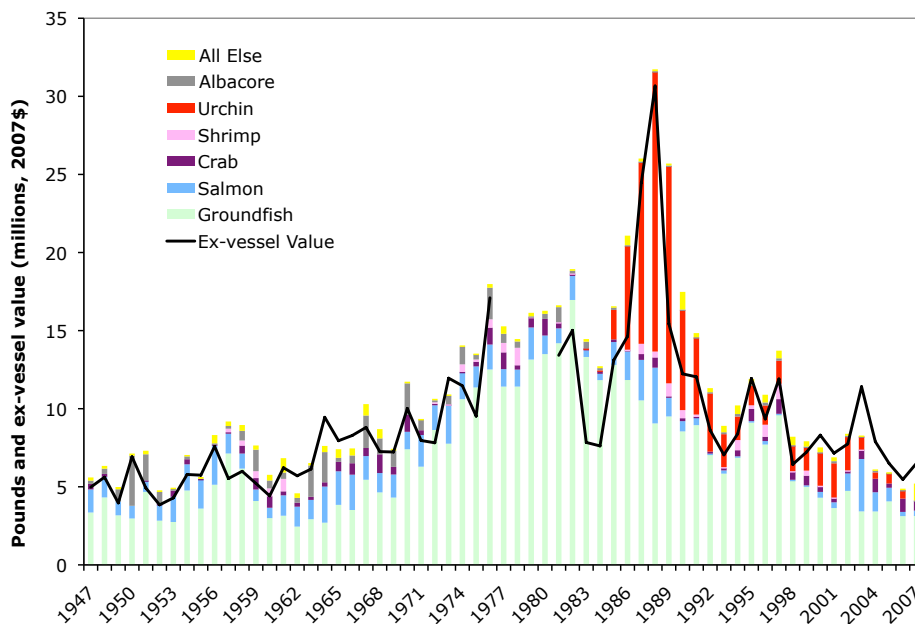


Figure 2. Pounds and ex-vessel value (2007\$) of commercial fishery landings at Noyo Harbor, 1947–2007 (CDFG Fish Bulletin Series). Note: Ex-vessel value data for 1977–1980 are not available; urchin data are available only for 1981–2007.

the north side of the harbor. The business continued into at least the early 1980s, offering marine supplies (including fuel), a cannery for processing sport catches, and boats for rent (Anon. 1983). In the mid-1960s six to seven party boats (CPFVs) operated out of Noyo Harbor, and during salmon season an estimated 200 private skiffs motored in and out of the harbor daily (Henning 1966).

As early as the 1970s, the seasonal influx of anglers and other tourists would significantly expand the population of Fort Bragg and the surrounding area during the summer months (PFMC 1978). As of the early 1980s, three charter vessels – the *Tally Ho II*, the *Beulah*, and the *Pattercat* – specialized in salmon and albacore fishing out of Noyo Harbor (Anon. 1983).

As the recreational fisheries for finfish species grew, so did the sport fishery for red abalone, which had started well before World War II. According to (Cox 1962), prior to that time, almost all sport fishing for abalone was done in the intertidal zone during low tide. The advent of rubber skin diving suits, however, made collecting in nearshore waters (regardless of the tide) possible, whether from shore or from skiffs launched from the beach, Noyo Harbor or other local landings.

Commercial fishing activity at Noyo Harbor continued to expand through the 1970s, encouraged directly and indirectly by various federal programs aimed at encouraging the development of the nation's fisheries. The 1971 reauthorization of the Farm Credit Act enabled commercial fishermen to obtain loans through local Production Credit Associations, which had been making such loans to farmers and ranchers since 1933 (Deweese 1976, NOAA 1999). Additionally, the Capital Construction Fund and Fishing Vessel Obligation Guarantee program (authorized by the Federal Ship

Financing Act of 1972) offered low interest or government-backed loans, tax-deferred vessel repair and construction programs, fuel tax relief, gear replacement funds, market expansion programs and technical assistance (NOAA 1999). These opportunities helped to substantially increase fleet size and capacity.

Into the 1980s, the mix of commercial fisheries changed somewhat due to increasing regulation of the salmon and groundfish fisheries and the development of the red sea urchin fishery. Originating in Southern California in the early 1970s, the fishery targeted red sea urchin for their roe (eggs), a highly valued seafood in Japan (Kalvass and Hendrix 1997). Although landings were made in the area as early as 1972, the fishery remained small until the early 1980s when fishermen from the maturing Southern California urchin fishery began to explore the grounds off Fort Bragg. At that point, the Northern California fishery grew rapidly, helped by increased market demand, as well as a weak U.S. dollar relative to the Japanese yen at that time (Deweese 2003). Effort and landings in the urchin fishery peaked in the late 1980s, then declined with changing resource conditions, markets and prices. Meanwhile, a commercial fishery for hagfish developed out of Noyo in 1989, but was short-lived due to the collapse of the Korean eel skin market.

According to the Noyo Harbor Plan (Winfield Smith & Associates and Land Planning Research 1992), in 1990 there were five fish and/or urchin processing plants⁷, three boat repair yards, seven stores that provided marine hardware, equipment and repair, and one boat building yard located at the harbor. Berthing included 269 occupied slips (with a waiting list) at the boat basin and just over 100 slips (used mostly by 15- to 18-foot commercial vessels) at Dolphin Isle Marina. As many as 500 boats occupied the harbor during peak

salmon fishing season, and would tie up at any available dock or float, or raft to (tie up alongside) other boats downriver from the boat basin. Harbor District staff report that the boat basin was fully occupied, 85% by commercial boats and 15% by recreational boats, at that time.

The Expansion of Fishery Management

Commercial fishery management

Through the late 1970s, Fort Bragg area fisheries were subject to modest management, and landings were driven largely by resource availability and market demand. With the passage of the Magnuson-Stevens Fishery Conservation and Management Act in 1976, and the creation of the Pacific Fishery Management Council (PFMC), as well as increased state fishery management, things began to change. By the late 1970s and early 1980s, the fishing community faced increasing restrictions in the salmon troll and groundfish trawl fisheries.

During the period 1971–1979, the California commercial salmon season lasted from mid-April through September (a month shorter for coho; PFMC Salmon Technical Team 1993). In 1979, fishery managers divided the state into north and south management areas and in 1982, implemented a limited entry program that reduced the size of the fleet at Noyo as well as other salmon ports statewide. The troll season off the Mendocino coast declined to 131–153 days during the period 1981–1988, and further contracted to 107–114 days during the period 1989–1991. In 1992, the season was closed. Since then, the season has been open for 1–2½ months – with five exceptions: the 118-day opener in 2003, the 5-day opener in 2006, and the fishery closures in 1992, 2008 and 2009. The 1992 and 2006 actions were due to conservation concerns regarding Klamath fall Chinook, while the 2008 and 2009 closures were due to low escapement of Sacramento River fall Chinook.

Season length and other regulatory constraints since the early 1990s have been related to a number of factors. Beginning in 1992, the PFMC prohibited retention of coho in the commercial salmon fishery south of Cape Falcon (Oregon) to address conservation concerns regarding Oregon Coastal Natural coho (PFMC 1992). This led to fishery disaster declarations for Northern California and Southern Oregon fishing communities in 1994 and 1995.⁸ In 1993, the U.S. Department of the Interior Solicitor issued an opinion allocating 50% of Klamath-Trinity River Chinook salmon to the Yurok and Hoopa tribes (Digitale 1992, Pierce 1998). This was significantly higher than the 30% tribal allocation brokered by the Klamath Fishery Management Council in a previous 1987–1991 agreement, and required reduced allocations for the nontribal sectors of the fishery.⁹

As the salmon fishery faced increasing constraints, the sea urchin fishery expanded. The local urchin fishery peaked in 1988 with just over 47 million pounds landed statewide, about 18 million pounds (38%) of which was landed in Fort Bragg.¹⁰ Prior to 1989, the red sea urchin fishery was largely unregulated, and in the 1960s, sea urchin eradication programs were implemented to reduce grazing on kelp, which was harvested for industrial uses (Deweese 2003). In 1987, following recognition by the industry and the CDFG that the fishery was in need of active management, the CDFG Director's Sea Urchin Advisory Committee (DSUAC) was formed, and the state implemented a moratorium on new permits, and restricted access – along with minimum size limits – in 1989. The following year, an effort reduction scheme was implemented, and within-season closures were added in the early 1990s. In 2003, the state eliminated the statewide May through September monthly week-long closures, following an overall effort decline (induced by regulatory and market

conditions) together with industry concerns that the closures made it difficult to maintain a consistent market presence during the summer months (CDFG 2004). At present, the season is open four days per week from June through October, and seven days per week from November through May.

The groundfish fishery also was a key component of activity at Noyo Harbor, although it, too, faced substantial changes over time. In 1982, the PFMC implemented the federal West Coast Groundfish Fishery Management Plan (FMP), and began to manage the commercial fishery with measures such as harvest guidelines, trip landing and trip frequency limits, and gear restrictions. In 1994, the PFMC implemented a coastwide limited entry program for the trawl and fixed gear (hook-and-line and pot) fisheries; a small open access fishery for nontrawl fishermen also was retained.

In 1992, the PFMC adopted a harvest rate policy for groundfish based on the assumption that West Coast groundfish were similar in productivity to other well-studied groundfish stocks. Over the next eight years, as growing scientific evidence indicated that rockfish had productivity rates much lower than other groundfish species, the PFMC adopted increasingly restrictive management measures.¹¹ To afford fishery participants more flexibility and enable them to reduce discards associated with shrinking trip limits, trip limits were subsequently replaced with cumulative landing limits that gradually expanded in duration: weekly, biweekly, monthly, bimonthly. However, these new restrictions, as unprecedented as they were, came too late to reverse the effects of longstanding harvest policies based on inaccurate assumptions. Between 1999 and 2002, eight groundfish stocks were declared overfished¹² and, in 2000, a federal disaster was declared in the West Coast groundfish fishery.

To rebuild overfished stocks, optimum yields (OYs) and vessel landing limits for healthy stocks typically taken with the species of concern, as well as those overfished species, were cut further for both limited entry and open access vessels. The PFMC also implemented rockfish conservation areas (RCAs) to reduce the catch of overfished species (PFMC 2008). Implemented in September 2002, the first federal RCA closed continental shelf and slope waters to commercial groundfish fishing from near Cape Mendocino (north of Fort Bragg) north to the Canadian border. The severe decline in harvest opportunities exacerbated the problem of excess harvest capacity, and led to measures such as the industry-funded federal West Coast groundfish trawl buyback program in 2003. In subsequent years, groundfish trawlers have been subject to area closures to protect groundfish Essential Fish Habitat and both limited entry and open access vessels have been required to carry vessel-monitoring systems.¹³

Management of the groundfish fishery in state waters (0–3 miles) also became more restrictive during this time. Motivated by the emerging live fish fishery (McKee-Lewis 1996), the passage of the Nearshore Fishery Management Act (within the state's Marine Life Management Act) in 1998 established minimum sizes for 10 commonly caught nearshore species, established a permit for those 10 species (effective in 1999), and mandated the development of a Nearshore FMP. In 2001, the nearshore rockfish fishery was closed outside 20 fathoms from March through June. Two years later, the state implemented the Nearshore FMP which specified management measures for 19 nearshore species including gear and seasonal restrictions, as well as a restricted access program as a means to achieve the statewide capacity goal of 61 participants (down from

1,128 in 1999). Six local fishermen currently hold nearshore fishery permits.

The urchin fishery was managed historically using gear, minimum size and season length measures. Following a sharp increase in effort, the state established a moratorium on new permits in 1987, and limited entry in 1989. Through the early 1990s, the state implemented a stringent effort-reduction scheme, which required a 10-for-one permit swap for entry into the fishery, and established seasonal and weekly closures. In 2003, with fishery participation effectively capped, inseason temporal closures were relaxed.

The Dungeness crab fishery has not experienced the types of dramatic management changes as have occurred in the salmon and groundfish fisheries. The state has used a “three S” (sex, size, season) strategy that includes male-only harvest (since 1897), a minimum size limit (since 1911) and a limited season (since 1957) to manage the fishery. In 1992, the state placed a moratorium on entry; in 1995, a restricted access program was implemented. The northern crab season usually runs from December 1 through July 15 (with an early season opener off San Francisco starting November 15), but its start has been delayed in some years because of price disputes. In addition, the opening of the crab season may be delayed to insure that males have completed molting, as occurred in 2005. In 2009, the state convened a Dungeness Crab Task Force in response to concerns about recent increases in participation and gear use. Following the recommendation of the Task Force (California Dungeness Crab Task Force 2010), a bill that would establish a pilot crab pot allocation program to address those concerns (SB 1039, Wiggins) is pending in the State Legislature.

Recreational fishery management

Recreational fishing activity also has been affected by changes in salmon and groundfish regulations over time. Through 1991, the recreational salmon season was open from about mid- February through mid-November, and averaged 264 days (about nine months). In 1992, however, the season was reduced to 200 days (about six months) to help address concerns about the status of Klamath River fall Chinook. The local fishery was closed during June, the latter half of July, and August, the traditional height of the season when visiting as well as local anglers typically fish from Noyo Harbor. Nevertheless, the Fort Bragg area offered considerably more fishing opportunity than the 14-day season in the California portion of the Klamath Management Zone (KMZ), located north of Fort Bragg. From 1993 through 2007, mid-season closures continued, and the local salmon season averaged 259 days (just under nine months). As in earlier years, the season was longer in the Fort Bragg area than in areas further north. In 2008, however, conservation concerns regarding Sacramento River fall Chinook drastically curtailed the Fort Bragg season to 45 days (with a complete closure everywhere else in the state). In 2009, the fishery was closed statewide (except for a 10-day opener in the California portion of the KMZ).

The recreational groundfish fishery out of Noyo (as elsewhere in the state) has been increasingly constrained since the late 1990s to address concerns regarding depleted or overfished groundfish stocks. Measures have included bag limit reductions first implemented in 1998, season length restrictions since 2001, and depth-based area closures since 2004. In 2001, the once year-round fishery was compressed to two months. Season length in that area gradually increased to nine months in recent years, as area closures have somewhat mitigated the need for short seasons. In

general, seasons have not been as restrictive in Fort Bragg as in the rest of the state, with the exception of 2005, when the state's South-Central season (seven months) exceeded Fort Bragg's (six months).

The recreational fishery for red abalone has been subject to regulation since the early 1900s, with measures related to gear use, timing, species, number and size of animals taken and other aspects of the fishery (CDFG 2006). Starting in the 1950s, the use of scuba gear was prohibited, and the fishery was limited to daylight hours (one-half hour before

sunrise to one-half hour after sunset). Since 1976, the season has been limited to April through June and August through November. Divers have been limited to red abalone since the mid-1990s, and in 1997, the fishery was closed south of San Francisco. In 2000, a mandatory report card and an annual limit of 100 abalone per person were implemented. Two years later, the daily bag limit for red abalone was reduced from 4 to 3, and the annual limit was reduced from 100 to 24 per person, due to concerns about the status of local stocks.

THE NOYO HARBOR FISHING COMMUNITY TODAY

The Noyo Harbor fishing community is comprised of commercial and recreational fishery participants and their families, as well as fishery-support businesses (including the harbor district), that provide goods and services that fishery participants need to operate safely and effectively (Table 1). Local commercial fisheries include a diversity of participants engaged in a range of fisheries and fishery-related activities. Recreational fisheries include private boat and commercial passenger fishing vessel (CPFV) or ‘charter’ operations that involve locals and nonlocals alike.

Commercial Fisheries

The primary commercial fisheries at Noyo Harbor currently include the groundfish trawl, urchin dive, Chinook salmon troll, Dungeness crab pot, and sablefish and rockfish/lingcod hook-and-line and trap fisheries.¹⁴ Other fisheries of past or lesser importance include the albacore troll, shrimp trawl, and Humboldt squid jig fisheries, among others.

Most of these fisheries are seasonal as a function of resource availability, regulations, the availability of buyers, and market demand (Table 2). However, it should be noted that the actual temporal distribution of activity is often more compressed, variable and complex than suggested by this table. For instance, the availability of albacore varies widely from year to year, contingent on environmental conditions. The salmon fishery at Noyo Harbor is consistently open in September and sometimes in additional months (most commonly July and/or August), except when the fishery is closed statewide (as it was in 2008 and 2009). The Dungeness crab and sea urchin fisheries are concentrated in the winter months during peak holiday demand, and the urchin fishery is closed three days per

week from June through October. Groundfish seasons tend to be defined in two-month increments (reflecting the use of bimonthly vessel cumulative landing limits), vary by species and fishery sector, and are sometimes subject to inseason closures to prevent optimum yield (OY) of selected species from being exceeded.

As of early 2009, approximately 60–80 commercial fishing vessels were homeported at Noyo Harbor. Fishery participants described the makeup of the resident fleet as including roughly seven trawlers, 30–40 salmon trollers, 15–20 multi-fishery vessels, and about 10–15 urchin dive boats.¹⁵ Although some fishermen in these groups are specialized, most participate in multiple fisheries. Some are full-time, while others are part-time fishermen. Full-time skippers depend on fishing for their livelihood and fish year-round, as resource availability, weather and regulations permit. Part-time skippers fish part of the year, often focusing on a single fishery, and may pursue other activities (on or off the water) as part of their livelihood.

The frequency and duration of fishing trips varies within and among fisheries. Most of Noyo’s hook-and-line groundfish vessels work as day-boats, while most groundfish trawlers are trip-boats, taking trips of one to four days. Local salmon and crab trips last one to five days. Some fishermen travel up and/or down the coast to follow the salmon (and the openers). In addition, some crabbers travel to the San Francisco Bay area for the mid-November opening of the fishery in that region. For those who target albacore, trips last from 14 to 40 days, with deliveries made locally or at Oregon and Washington ports with sufficient receiving and processing capacity.

Table 1. Support businesses used by Noyo Harbor fishery participants. Note: Blank space in number of employees = unknown; ‘OOB’ = out of business.

Business Type	Business Name	Number of Employees
Receivers	Caito Fisheries	50
	Captain Bobino’s	
	Ocean Fresh, LLC	45–50
	P Seafoods*	4 FT
	Pacific Rim Seafood	50 FT/PT
	Tommy’s Marine Service & Supply	2 FT
Processors	Caito Fisheries	(see above)
	Ocean Fresh, LLC	(see above)
	Pacific Rim Seafood	(see above)
Marine Supply/Repair (mechanical, electrical, hydraulic)	ACME Hardware	
	Emerson’s Marine Service	
	Estes Marine	OOB
	Fort Bragg Marine	1 FT
	Tommy’s Marine Service & Supply	(see above)
	Westfall Commercial Marine	OOB
Marine Refrigeration	John Ruczak Refrigeration	1FT, 1PT
Cold Storage	None	n/a
Ice Facility	Harbor Ice	1 FT
Fuel	Fort Bragg Marine	1 FT
	Mendocino Coast Petroleum	
Bait	Noyo Fishing Center	1 FT
Vessel Repair/Maintenance	Makela Boat Builders	1 FT
	Tommy’s Marine Service	(see above)
	Van Peer Boat Works	1–3FT
Commercial Diver	Dan’s Diving Service	1 PT
Retail Fish Market	Harvest Market	
	Fish Peddler	1 FT
	Nemo’s Market (Ocean Fresh)	
Charter Operation	All Aboard Adventures (F/V <i>Seahawk</i>)	4 FT/PT
	Anchor Charter Boats (F/V <i>Trek II</i>)	
	Fort Bragg Sportfishing (F/V <i>Bragg-N</i>)	2 FT
	North Coast Fishing Adventures & Noyo Fishing Center (F/V <i>Rumblefish</i>)	1 FT
	Telstar Charters (F/V <i>Telstar</i>)	1 FT
Kayak Rental	Fort Bragg Marine (kayak/dive gear rentals/sales)	2 FT
	Noyo Fishing Center	(see above)
	Subsurface Progression	(see above)
Port Management	Noyo Harbor District	3 FT, 1PT, seasonal
	Dolphin Isle Marina	4 FT, 1–2 PT
Other	SeaPal (fish emulsion producer)	1 FT, 1 PT
	Bruce Abernathy (marine salvage)	

* Out of business as of early 2010; Zephyr Seafoods owns and operates receiving station.

Table 2. Seasonality of selected commercial fisheries at Noyo Harbor.

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC
Albacore												
Crab												
Groundfish												
Pink shrimp												
Salmon												
Urchin												

Urchin divers make day trips, but occasionally relocate to other North Coast ports such as Albion, Point Arena and, in the past, Bodega Bay, depending on the distribution and accessibility of the resource.

In addition to resident fishermen, a number of transient fishermen use Noyo Harbor and Fort Bragg’s fishery-support infrastructure, especially during salmon season. Because the fishing grounds off Fort Bragg have historically been among the best for salmon, and because of tighter restrictions to the north, many California commercial salmon fishermen from other ports call at Noyo during the season.

Noyo Harbor Seafood Receiving, Processing and Marketing

As of March 2009, local receiving and processing capacity consisted of six buyers with receiving stations, including three receiver/processors. Caito Fisheries processes mainly groundfish,

crab and salmon, while the two other processors (Ocean Fresh and Pacific Rim Seafood) are primarily focused on urchin. In the landings data, several fishermen – and some fishermen from outside the area – are counted among local buyers because they market some of their (and perhaps others’) catch directly to retailers and to consumers (e.g., through ‘off-the-boat’ sales; Figure 3). Because there is no public hoist for offloading fish, some resident buyers also receive fish on behalf of these fishermen as well as other entities based elsewhere along the West Coast. Some fish businesses that operate out of Noyo Harbor are vertically integrated, and function in multiple roles (e.g. receiving, processing, wholesaling and distributing).

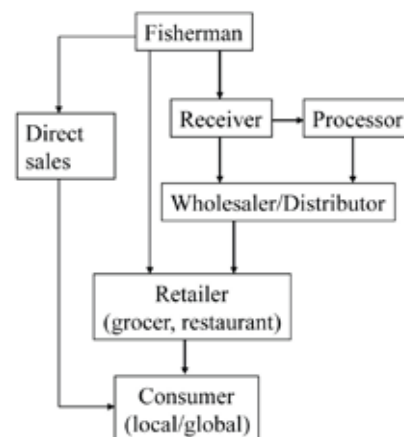


Figure 3. Pathways of seafood landed at Noyo Harbor. Note: thicker arrows indicate most common pathways.

Table 3. Product forms, processing location and destination of seafood landed at Noyo Harbor for selected fisheries.

	Product forms	Processing location	Markets
Albacore	Whole, filet, canned	Noyo Harbor, Other California	Local to nationwide
Crab	Cooked whole & sectioned, picked and canned, live	Noyo Harbor	Local to nationwide
Groundfish	Whole, filet, live	Noyo Harbor, Other California	Local to overseas
Salmon	Whole, filet, steak, smoked	Noyo Harbor, Other California	Local to nationwide
Sea urchin	Packed roe	Noyo Harbor	Large metropolitan areas nationwide, Japan

Product forms vary within and across fisheries (Table 3). Most groundfish – about 50-60%, according to a local receiver – is processed locally. At least one resident fish receiver as well as several local fishermen handle live fish for transport to San Francisco Bay area markets. Salmon and albacore products primarily include whole, dressed fish (which have been gutted); some of the catch is cut into filets and steaks, or processed into smoked or canned products for local or regional sale. Crab landed at Noyo Harbor may be cooked and frozen whole or in sections (with a small amount picked and canned), although live crab has become more common over the past decade, largely due to growing demand in the San Francisco Bay area. Sea urchin is processed by chilling, breaking open the shell to remove the roe, and packing it in wooden trays for shipment to markets throughout the U.S. and Japan.

Ocean Recreational Fishing

Recreational fishing out of Noyo Harbor is done from private boats as well as charter operations (CPFVs). As of early 2009, five CPFVs (with 6- to 40-person capacity) served resident and nonresident anglers. Kayak-based fishing is increasingly popular, with a number of local shops providing rentals.

Noyo Harbor anglers pursue an annual round of fisheries that primarily includes Chinook salmon, groundfish (especially rockfish and lingcod) and abalone, along with some albacore and Dungeness crab (Table 4). As with commercial fisheries, the seasonality of recreational fisheries is defined by resource availability and regulations, and further limited by conditions at the harbor entrance and weather in general. Therefore, actual recreational activity is often more compressed and variable than indicated by the table.

Table 4. Seasonality of major recreational fisheries at Noyo Harbor.

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC
Abalone												
Albacore												
Crab												
Groundfish												
Salmon												



Harbor Infrastructure and Fishery-Support Businesses

The port of Noyo is governed by the Noyo Harbor District, an independent special district of the state established in 1950 under the California Harbors and Navigation Code (Sec. 6200 et seq.). The district is governed by a five-member Board of Commissioners appointed by the Fort Bragg City Council and the Mendocino County Board of Supervisors every four years. The district owns land and tideland properties on roughly 41 acres adjacent to the southern city limits (Winfield Smith Associates & Land Planning Research 1992). Funding for improvements and maintenance is derived primarily from slip, hoist and pier use fees.

Harbor-managed infrastructure is primarily located along the south side of the river, and consists of a 240-slip boat basin with service facilities, a work hoist (fish offloading is prohibited), two launch ramps, harbor office building, and parking and storage areas (Table 5). Further upriver is Dolphin Isle Marina and RV Park, with 150 slips (100 in the marina, 50 in the adjacent river for small boats), 85 RV spaces, a fuel dock, a café and store, a fish-cleaning station and a vacation rental (for visiting fishermen and others). Adjacent to the marina are two small businesses, including a small engine repair shop. Both resident and nonresident fishery participants (fishermen and fish buyers) depend on this infrastructure, as well as the goods and services provided by approximately 25 local

fishery-support businesses and at least four located elsewhere in the North Coast region (see Table 1, Table 6). Although the harbor does not have a boatyard to handle larger vessels, one business provides a facility for hauling out smaller boats (up to 50 feet in length) for maintenance and repair, another specializes in wooden boat construction, restoration and repair, and steel boat builder is located within a mile of the harbor.

Although specific needs vary by fishery and fishing operation, the harbor area businesses most commonly used by commercial fishermen include receivers/processors, marine repair and supply services, the fuel dock and the ice plant. Recreational fishermen utilize the marinas at Noyo Harbor and Dolphin Isle, marine supply stores and fuel dock, as well as hotels, campgrounds, restaurants and grocery stores in and around Fort Bragg.

Fishing Organizations and Events

Several fishing organizations are active in Fort Bragg. The oldest local organization is the Salmon Trollers Marketing Association (STMA), established in 1953 to address fishermen's interests at the harbor and in fishery management. At the height of the salmon fishery in the early 1980s, the STMA had 350 members (Gross 1982); today, it has about 40 members, and is headquartered at the harbor.

The Fishermen's Marketing Association (FMA), based in McKinleyville, California,



Table 5. Noyo Harbor and Dolphin Isle Marina infrastructure and resident businesses, as of July 2008.

Location	Harbor-owned facilities and services	Resident business types
Noyo Harbor	Docks/slips Inner basin (240) Transient dock Launch ramps (2) Fuel dock (operated by Fort Bragg Marine Supply) Offloading infrastructure - None Other infrastructure - Work dock/hoist - Bilge pump-out station - Oil recycling station - Visitor berthing - Dock power, water - Waste disposal - Storage lot - Parking lot - Bathrooms/showers	Bait/tackle shops (2) Boat building/repair (2) Charter operations (5) Coast Guard station (1) Fish buyer (6) Fish emulsion producer (1) Fish processor (3) Fish market (2) Ice plant (1) Marina (1) Marine salvage (1) Marine surveyor (1) Marine supplies (3) Restaurants (7)
Dolphin Isle Marina	Docks/slips Marina (100) Adjacent to marina (50) Fuel dock Offloading infrastructure - None Other infrastructure - Visitor berthing - Dock power, water - Fish cleaning station - Waste disposal - Parking lot - RV hookups (85) - Vacation rental - Bathrooms/showers - Laundry - Café	Small engine repair (1)

Table 6. Out-of-area support businesses used by Noyo Harbor fishery participants.

Business name	Business Type	Location
Trinity Diesel	Hydraulics	Eureka
Englund Marine	Marine supply	Eureka
Fred's Marine Electronics	Marine electrical	Eureka
Fashion Blacksmith	Vessel repair/maintenance, fabrication	Crescent City

was established in 1952 by a group of Eureka-based groundfish trawl fishermen to address marketing issues with fish buyers, and in later years, management issues. In the late 1980s, the organization expanded to include shrimp trawlers and groundfish trawlers from other port areas, including Fort Bragg.

The California Sea Urchin Commission (CSUC), established in 2004 (replacing the Sea Urchin Harvesters' Association California, SUHAC), includes several local fishery participants.¹⁶ The organization plays multiple roles including funding and participating in research on the resource and the fishery; developing management alternatives, educational and marketing programs; and advocating for the industry.

Established in the 1970s, Noyo Women for Fisheries (NWFF) promotes the fishing industry and seafood products through education and advocacy. With 15–20 members at present, it has developed and implemented a fisheries curriculum for local elementary school children, produced seafood cookbooks, and worked together with the STMA, the Salmon Restoration Committee and others in the community to put on the annual “World’s Largest Salmon Barbecue” in July each year.¹⁷

In addition, NWFF maintains the Memorial Garden at Noyo Harbor, which they established in the early 1970s, to honor those lost at sea.

The North Coast Fishing Association (NCFA), established in 2004, currently has about 120 members, more than half of them from the Fort Bragg area. The NCFA advocates for regional recreational fishing interests on a variety of fishery issues, including the Marine Life Protection Act (MLPA) process and proposed offshore wave energy projects along the North Coast. It also educates anglers, for example, distributing deflator/descender kits to promote safe and effective return of live rockfish to the ocean. The NCFA is affiliated with the national Recreational Fishing Alliance, and communicates with the Humboldt Tuna Club in Eureka.

In 2007, as the North Coast became the focus of wave energy development discussions in the state, local fishing organization representatives and other interests joined in the establishment of Fishermen Interested in Safe Hydrokinetics (FISH). FISH monitors and comments on the wave energy permitting and licenses processes conducted by the Federal Energy Regulatory Commission (FERC) off the Mendocino County coast (Bacher 2009).

COMMERCIAL FISHERY ACTIVITY AT NOYO HARBOR

The information in this section is based on customized summaries of Pacific Fisheries Information Network (PacFIN) landings receipt data, augmented by sources that provide earlier and/or longer-term data, as well as data from fieldwork conducted in 2007 and 2008. In the discussion that follows, the *long term* is the period from 1981 through 2007, whereas *recent years* pertains to the most recent five years of the time series (2003–2007), unless otherwise noted.¹⁸ The purpose of focusing on these two time periods is to demonstrate how recent activity compares to the longer-term. While the long-term trends described in this section begin in 1981, it should be noted that some local fisheries (e.g., groundfish, salmon, crab) were established well before that year (see Figure 2).¹⁹

We use five measures of fishing activity derived from the landings receipt data. Landings are reported as ‘round weight’ (in pounds), reflecting the total weight of the fish caught. (For species like salmon, which are gutted at sea, landed weights are converted to round weights to provide comparability with other species.) Ex-vessel value represents the amount paid to fishermen at the first point of sale (usually to a dockside buyer or receiver). Prices are calculated as the total ex-vessel value divided by total pounds landed. Both ex-vessel value and price are adjusted for inflation using 2007 values as a base. Boat counts represent individual (resident and nonresident) fishing operations, though not necessarily individual fishermen, as some fishermen may own and/or operate multiple boats, and most boats have crew (and possibly multiple skippers) that these counts do not include. Buyer counts are based on the number of unique buyer IDs in the landings data, and include fishermen who land their own catch (e.g., for off-the-boat sales, direct sales to

grocers and restaurants) as well as buyers who purchase fish from fishermen delivering their catch at the docks.²⁰ The number of trips provides a count of the number of deliveries each boat makes at the port.²¹ To insure confidentiality, data are not reported for some fisheries and/or years if fewer than three vessels or buyers participated.

Overall fishing activity at Noyo has declined over time, as indicated by most measures. Total annual landings (all species) have ranged from a high of 32.2 million pounds (in 1988) to a low of about 4.9 million pounds (in 2006; Figure 4, Table 7). Average annual landings were 52% lower in recent years (6.3 million pounds) relative to the long-term average (13.2 million pounds). This difference reflects an 81% reduction in urchin landings and a 60% reduction in groundfish trawl landings, partially offset by a 52% increase in salmon landings and a 70% increase in crab landings between the long term and recent years.

Groundfish trawl, urchin and salmon were the top three fisheries over the long term, accounting on average for 58%, 20% and 7%, respectively, of total landings. These fisheries’ contribution to total landings peaked as follows: groundfish in 1982 (at 92%), urchin in 1988 (at 56%), and salmon in 2003 (at 44%). These fisheries continue to dominate landings



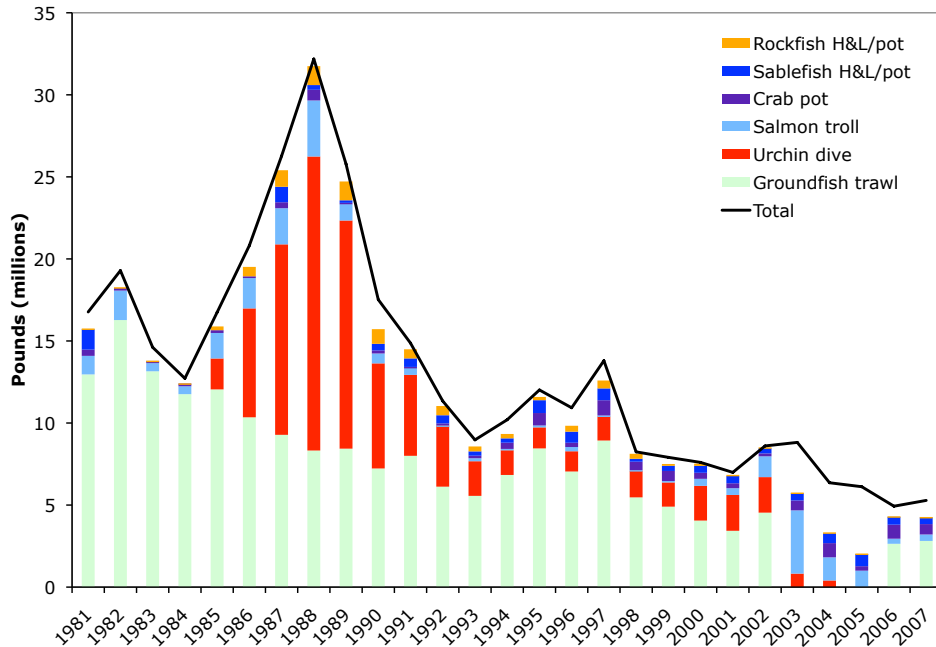


Figure 4. Commercial fishery landings (millions of pounds) at Noyo Harbor for selected fisheries and overall, 1981–2007. Note: Activity cannot be reported for years when more than zero but fewer than three boats or buyers participated in the groundfish trawl (2003–2005), sablefish (1982–1986) and urchin (1983–1984, 2005–2007) fisheries.

Table 7. Long-term and recent annual average, percent difference, and highs and lows in selected measures for commercial fisheries at Noyo Harbor, 1981–2007.

All fisheries	Long-term average (1981–2007)	Recent average (2003–2007)	Percent difference	High year(s) (amount)	Low year(s) (amount)
Landings (lbs)	13,173,619	6,302,142	-52	1988 (32,185,639)	2006 (4,930,105)
Ex-vessel value (\$)	11,017,673	7,560,411	-31	1988 (30,616,680)	2006 (5,474,908)
Boats	458	258	-44	1988 (968)	1998 (175)
Buyers	39	45	+15	2003 (56)	1982 (20)
Trips	6,744	3,097	-54	1988 (20,638)	2006 (2,322)
Price (\$/lb)	0.88	1.19	+34	2003 (1.30)	1983 (0.54)

at the port, accounting for 48%, 11% and 19%, respectively, of landings in recent years.

The crab and sablefish fisheries each accounted for less than 5% of landings over the long term, but increased to 11% and 9%, respectively, in recent years. The rockfish fishery has played a

lesser role, accounting for 2% of landings over the long term and less than 1% in recent years. Still other fisheries, including albacore, shrimp, shark and hagfish, have played a small or intermittent role at the port, even if they have figured more importantly in the annual round of fisheries for some individuals.

The ex-vessel value of commercial fishery landings at Noyo Harbor ranged from a high of \$30.6 million (in 1988) to a low of \$5.5 million (in 2006), averaging \$11 million over the long term and \$7.6 million in recent years (Figure 5, Table 7). Over the long term, groundfish trawl, salmon and urchin were the top three fisheries, averaging 37%, 22% and 16%, respectively, of ex-vessel value. In recent years, salmon ranked first, accounting for 41% of ex-vessel value, followed by groundfish trawl (24%) and crab (17%), while the urchin fishery contribution dropped to an average of 4% of ex-vessel value. The rockfish, albacore and shrimp trawl fisheries averaged 1%–5% of ex-vessel value over the long term and less than 2% in recent years. In contrast, the ex-vessel value of sablefish landings increased from about 7% over the long term to 11% in recent years. The number of boats with landings at Noyo Harbor (including nonresident as well as resident boats) ranged between a high of 968 (in 1988) and a low of 175 (in 1998). About

one-third (80) of the 242 boats that landed at Noyo Harbor in 2007 were resident boats. The annual average number of boats is about 44% lower in recent years (258 boats) relative to the long term (458 boats; Figure 6, Table 7) Most of this change is due to the substantial decline in the number of salmon trollers (-41%), reflecting the implementation of a statewide limited entry program in the early 1980s and reduced fishing opportunities following harvest reallocation between tribal and nontribal fisheries in the early 1990s.

The number of boats participating in other fisheries has declined as well. Average annual participation has been lower in recent years relative to the long term by about 73% in the urchin and rockfish fisheries, and about 50% in the groundfish trawl and albacore fisheries. As at some other North Coast ports, an exception is the sablefish fishery, where the average number of boats has been 42% higher in recent years relative to the long term. Average annual

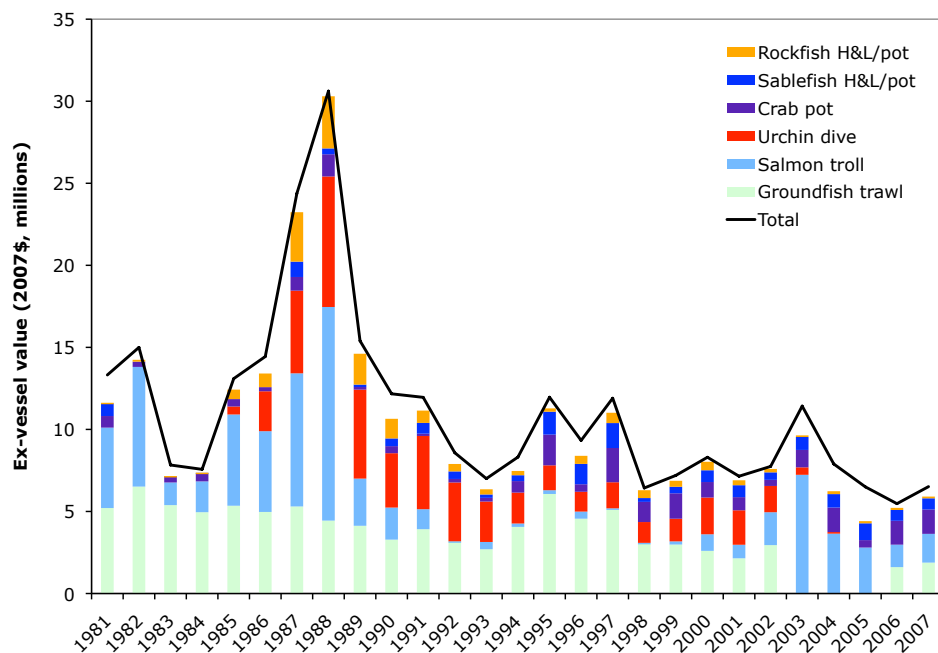


Figure 5. Ex-vessel value (2007\$) of commercial fishery landings at Noyo Harbor for selected fisheries and overall, 1981–2007. Note: Activity cannot be reported for years when more than zero but fewer than three boats or buyers participated in the groundfish trawl (2003–2005), sablefish (1982–1986) and urchin (1983–1984, 2005–2007) fisheries.

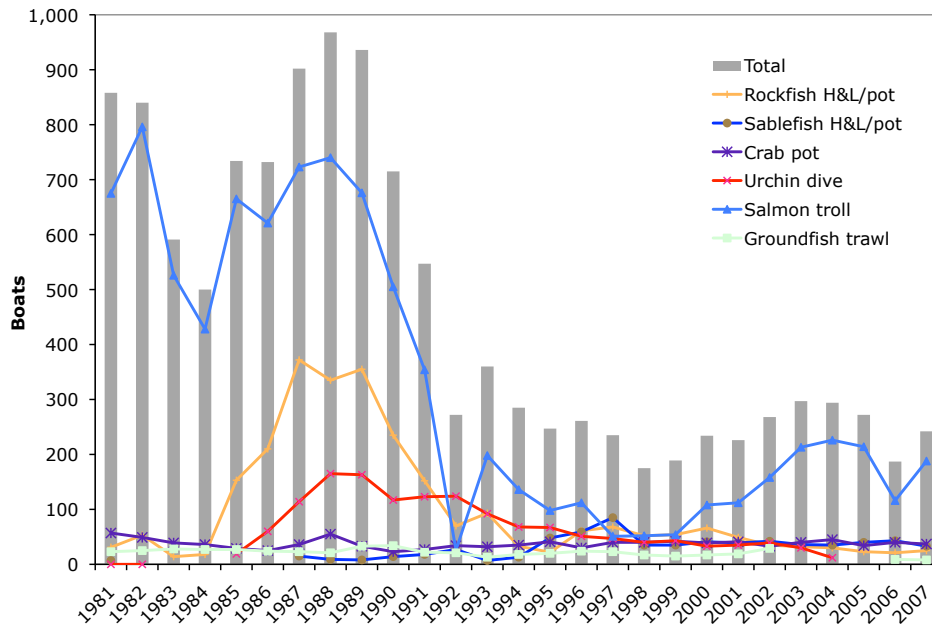


Figure 6. Number of boats with commercial fishery landings at Noyo Harbor for selected fisheries and overall, 1981–2007. Note: Activity cannot be reported for years when more than zero but fewer than three boats or buyers participated in the groundfish trawl (2003–2005), sablefish (1982–1986) and urchin (1983–1984, 2005–2007) fisheries.

participation in the crab fishery has been modestly higher (5%) in recent years relative to the long term.

Over the long term, the salmon, rockfish and urchin fisheries had the highest proportion of participants, averaging 62%, 20% and 14%, respectively. The crab and sablefish fisheries followed, with an average of 10%–11% of boats. For the recent term, the average proportion of boats participating increased to 73% in the salmon fishery and more than 15% in the crab and sablefish fisheries. At the same time, rockfish and urchin fishery participation declined to averages of 10% and 6%, respectively. Fewer than 5% of boats participated in the groundfish trawl and albacore fisheries over the long term, with fewer than 4% in recent years.

Noyo Harbor also has experienced an overall decrease in the number of fishing trips (or

deliveries; Figure 7, Table 7). Average annual activity in recent years (3,097 trips) is down 54% from the long-term average of more than 6,700 trips. This decline is primarily due to the 62% difference in salmon trips, which accounted for at least 70% of deliveries at the port between 1981 and 1985. The number of trips is lower in the recent term for several other fisheries, including urchin (-72%), groundfish trawl (-69%) and rockfish (-39%), although the absolute numbers of trips and boats involved in each fishery are small. In contrast, the crab and sablefish fisheries have experienced an increase in the average number of trips in recent years compared to the long term (+16% and +14%, respectively), although the number of boats and trips in these fisheries is relatively small, as well.

On average, salmon trips accounted for 37% of all deliveries over both the long term and in recent years, and peaked at 85% of deliveries

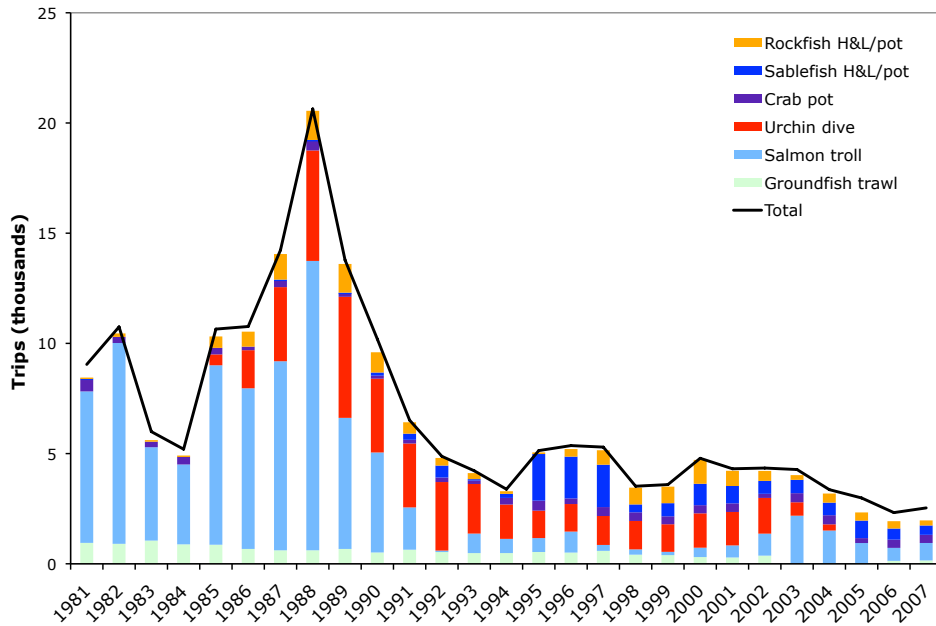


Figure 7. Number of trips by commercial fishing vessels landing at Noyo Harbor for selected fisheries and overall, 1981–2007. Note: Activity cannot be reported for years when more than zero but fewer than three boats or buyers participated in the groundfish trawl (2003–2005), sablefish (1982–1986) and urchin (1983–1984, 2005–2007) fisheries.

in 1982. Also notable are urchin trips, which peaked at 64% of all trips in 1992, but have declined from a long-term average of 25% of trips to 14% of trips in recent years. During the period 1995–1997, sablefish trips accounted for 35%–41% of trips, with long-term and recent averages of 12% and 19%, respectively. During the period 1981–1986, 20–29 buyers per year participated in Noyo Harbor fisheries. Since 1986, the number of buyers has varied widely from 28 (in 1997) to 56 (in 2003). Fewer than 30 buyers participated in 1995 and 1997, while more than 50 participated during between 1987 and 1990 and in 2003 and 2004. Of the 42 buyers that received commercially-caught seafood landed at Noyo Harbor in 2007, at least five were locally-based nonfisherman businesses, at least four were local fishermen, and 19 were fishermen and smaller receiving operations based in other locations in California, and in Oregon and Washington.

Over the long term, an average of 48% of Noyo Harbor buyers participated in the salmon fishery, 35% participated in the rockfish fishery, 29% participated in the crab fishery, and at least 15% participated in the groundfish trawl, urchin and albacore fisheries. In recent years, the average proportion of buyers participating in the salmon and crab fisheries increased to 70% and 34%, respectively. At the same time, the proportion of buyers participating in several fisheries declined to lower levels including: rockfish (21%), albacore (14%), sablefish (12%), and groundfish trawl and urchin (6%).

The average annual ex-vessel price per pound in recent years for all fisheries combined (\$1.19) is 34% greater than the long-term average of \$0.88 (Table 7). These overall averages, however, mask some substantial differences among fisheries. Prices have been lower in recent years relative to the long term

in the urchin (-54%) and crab (-16%) fisheries. In contrast, average annual ex-vessel prices were greater in the recent term compared to the long term for several fisheries including rockfish (+58%), sablefish (+23%), albacore (+18%), salmon (+12%) and groundfish trawl (+8%).

The distribution of ex-vessel value among boats and buyers provides insights into whether consolidation of fishing activity has occurred.²² The proportion of vessels accounting for 90% of the ex-vessel value of landings steadily increased from 29%–30% during the period 1998–1999 to 50%–53% during the period 2003–2005, then declined slightly to 44%–48% during the period 2006–2007. These changes suggest a general decline in revenue concentration among vessels. Among buyers, revenue concentration, measured as the proportion of buyers that account for 90% of the ex-vessel value of local landings, has been more variable. Between 1998 and 2000 and

2003 and 2005, 22%–27% of buyers accounted for 90% of the landed value. Concentration increased in the 2001–2002 and 2006–2007 periods, when 15%–19% of buyers accounted for 90% of landed value at Noyo.

Activity Within Commercial Fisheries

The Groundfish Trawl Fishery

The groundfish trawl fishery, active since the 1930s, ranks first among Noyo Harbor fisheries in landings and ex-vessel value for the long term, and first in landings and second in value in recent years. Over the last 27 years, the fishery has undergone significant decline, with all measures (except price per pound) 50%–60% lower in recent years relative to the long term (Figure 8, Table 8). Within this larger trend, activity in the fishery has varied, especially in terms of the number of boats participating and, to a lesser extent, landings. Factors that have affected activity include limited entry (1994), reduced vessel landing

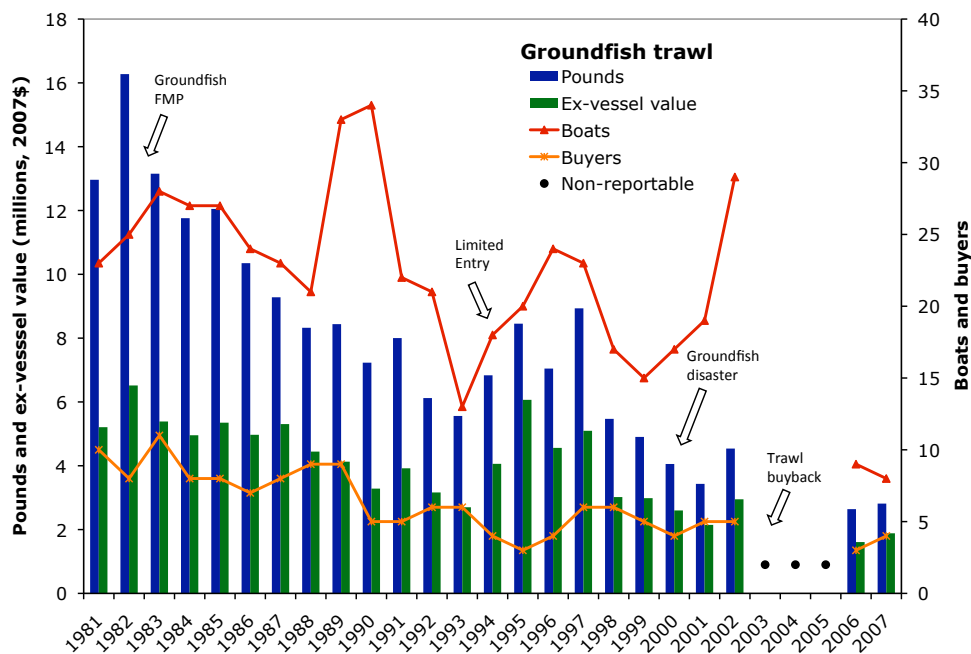


Figure 8. Landings, ex-vessel value (2007\$), and number of boats and buyers for the commercial groundfish trawl fishery at Noyo Harbor, 1981–2007. Note: Activity cannot be reported for 2003–2005, when more than zero but fewer than three boats or buyers participated.

Table 8. Long-term and recent annual average, percent difference, and highs and lows in selected measures for the commercial groundfish trawl fishery at Noyo Harbor, 1981–2007. Note: Years when more than zero and fewer than three boats or buyers participated (i.e., 2003–2005) are included in averages, but excluded from highs and lows.

Groundfish trawl	Long-term average (1981–2007)	Recent average (2003–2007)	Percent difference	High year(s) (amount)	Low year(s) (amount)
Landings (lbs)	7,331,649	2,955,869	-60	1982 (16,274,625)	2006 (2,640,210)
Ex-vessel value (\$)	3,757,033	1,724,623	-54	1982 (6,516,562)	2006 (1,608,579)
Boats	21	10	-52	1990 (34)	2006 (9)
Buyers	6	3	-50	1983 (11)	1995, 2006 (3)
Trips	523	165	-69	1983 (1,053)	2006 (133)
Price/lb (\$/lb)	0.54	0.59	+8	1995 (0.72)	1982 (0.40)

limits and the 2003 industry-funded buyback, which resulted in the departure of five of 12 resident trawlers from the fleet.

In 1982, a high of more than 16 millions pounds of trawl-caught groundfish valued at \$6.5 million was landed at Noyo Harbor. This represents a high for the fishery not only for 1981–2007 but also historically (since 1947, as far back as continuous data are available). Other than a short-term increase during the period 1995–1997, landings dropped steadily from the 1982 high to less than 3 million pounds in 2007. Average annual landings in recent years (3 million pounds) are 60% lower than the long-term average of 7.3 million pounds, due largely to increasingly stringent regulation of the fishery in response to declining abundance of some species.

Ex-vessel value also followed a decreasing trend, declining from a high of \$6.5 million in 1982 to less than \$1.8 million since 2003. Like landings, value also spiked (at \$4.7–\$6.1 million) during the 1995–1997 period before resuming its downward trends. The average value of landings in recent years (\$1.7 million) is 54% lower than the long-term average (\$3.7 million).

The average numbers of boats and buyers participating in the fishery are, respectively, 52% and 50% lower in recent years relative to the long term (Table 8). Vessel participation was 21–28 boats between 1981 and 1988, peaked at 33–34 in 1989–1990, then declined to 13–24 through 2001. Participation again increased to 29 boats in 2002, then declined to a long-term low of eight boats in 2007 (largely due to the buyback). The number of buyers also declined, from 8–11 between 1981 and 1985, to 3–6 between 1990 and 2002, and 2–4 through 2007.

The most marked change in groundfish trawl fishery activity is in the number of trips, which is 69% lower in recent years (165 trips) relative to the long term (523 trips). Fishing activity declined steadily from more than 900 trips per year between 1981 and 1983, to 485–674 trips between 1986 and 1997, and further declined to 133–180 trips during the period 2004–2007. This decline is proportionally greater than the decline in the number of trawlers, and reflects the shift from trip limits (which encouraged multiple trips of smaller landings in the 1990s) to weekly, biweekly, monthly and ultimately bimonthly limits (which allowed vessels to attain their limits with fewer trips).

Average annual prices for trawl-caught groundfish have increased slightly over time, due to factors such as changes in market conditions and the mix of species landed. (In addition, some fishermen have installed live tanks in their holds to allow for live fish production.) Prices ranged from \$0.40 to \$0.49 per pound between 1981 and 1993, then shifted upward to \$0.54–\$0.72 beginning in 1994. The peak price of \$0.72 occurred in 1995, a year of unusually high landings and revenues.



The Sea Urchin Dive Fishery

The commercial sea urchin dive fishery at Noyo Harbor began in earnest in the early 1980s, with the first reportable (nonzero) landings occurring in 1985 (Figure 9, Table 9). Activity increased rapidly through the decade as divers from Southern California’s crowded urchin fishery (where urchin quality had declined) and some local salmon fishermen entered the fishery. According to one fishery participant, “People came from everywhere – even the Gulf of

Mexico oil industry – it was a Gold Rush.”

However, the fishery declined substantially on all measures after 1989 amid a marked drop in the quality of urchin roe and competition from other (international) sources. Nonetheless, the fishery ranked among the port’s top three in terms of landings, buyers and trips, and the top five in terms of ex-vessel value and boats in recent years as well as the long term.

Landings jumped from zero pounds in 1981 and 1982 to a high of 17.9 million pounds in 1988, then fell to 3.7 million pounds by 1992. Landings

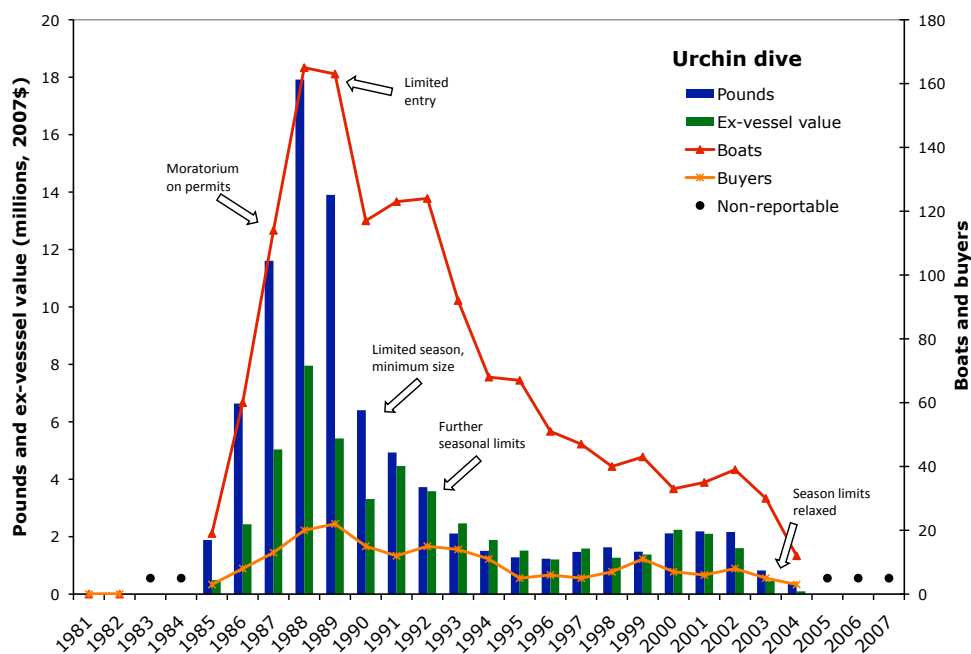


Figure 9. Landings, ex-vessel value (2007\$), and number of boats and buyers for the commercial urchin dive fishery at Noyo Harbor, 1981–2007. Note: Activity cannot be reported for 1983–1984 and 2005–2007, when more than zero but fewer than three boats or buyers participated.²³

Table 9. Long-term and recent annual average, percent difference, and highs and lows in selected measures for the commercial urchin dive fishery at Noyo Harbor, 1981–2007. Note: Years when more than zero but fewer than three boats or buyers participated (i.e., 1983, 1984, 2005–2007) are included in averages, but excluded from highs and lows.

Urchin dive	Long-term average (1981–2007)	Recent average (2003–2007)	Percent difference	High year(s) (amount)	Low year(s) (amount)
Landings (lbs)	3,500,515	656,066	-81	1988 (17,917,284)	1981, 1982 (0)
Ex-vessel value (\$)	1,905,496	296,693	-84	1988 (7,954,080)	1981, 1982 (0)
Boats	55	15	-73	1988 (165)	1981, 1982 (0)
Buyers	8	3	-63	1989 (22)	1981, 1982 (0)
Trips	1,573	433	-72	1989 (5,492)	1981, 1982 (0)
Price/lb (\$/lb)	0.90	0.42	-54	1983 (5.51)	2004 (0.24)

ranged from 1.2 to 2.2 million pounds during the 1993–2002 period, then declined to 400,000–870,000 pounds through 2007. At 656,000 pounds, average annual landings in recent years are 81% lower than the long-term average of 3.5 million pounds.

Similarly, the ex-vessel value of sea urchin landings grew sharply through the 1980s, peaking at \$8 million in 1988, then fell to \$3.6 million by 1992. Value ranged from \$1.2 to \$2.5 million during the period 1993–2002, then declined to \$96,000–\$536,000 through 2007. The average annual ex-vessel value in recent years (\$297,000) is 84% less than the long-term average (\$1.9 million).

The number of boats increased sharply from 19 in 1985 (when first reportable) to 163–165 in 1988–1989, then declined to 92 by 1993. The fleet declined further from 68 boats in 1994 to 30 in 2003, then stabilized at 11–12 boats through 2007. The number of buyers increased from 3 in 1985 to 22 in 1989. During the period 1990–94, 11–15 buyers participated in the fishery; since then, 2–8 buyers have participated (except in 1999, when 11 did). Overall, the average numbers of boats and

buyers are, respectively, 73% and 63% lower in recent years compared to the long term. The number of trips also grew rapidly in the mid-1980s, peaking at nearly 5,500 in 1989. The number of trips declined after that, to 2,250–3,347 between 1990 and 1993, and 1,243–1,620 between 1994 and 2002. The average for the recent term (433 trips) is 72% less than the long-term average (1,573 trips).²⁴ Between 1985 and 1990, local ex-vessel prices for sea urchin averaged about \$0.40 per pound, then increased to \$1.02 per pound during the period 1991–2000. Prices then declined, averaging \$0.42 per pound in recent years, a difference of -54% compared to the long-term average of \$0.90 per pound. One local urchin processor noted that this change was related to the interaction between market and environmental factors. The fishery faced strong competition from Chilean suppliers in 1992 and 1993, and Russian and Korean suppliers in the early 2000s. The subsequent decline in kelp coverage in nearby waters led to reduced urchin roe quality, further limiting markets and prices for local product. However, environmental and market conditions have changed, and activity in the fishery has increased since 2005.

The Salmon Troll Fishery

The commercial salmon troll fishery has long played a central role at Noyo Harbor, ranking among the top three fisheries on all measures both recently and over the long term (Figure 10, Table 10; see also Figure 4). The average numbers of boats and trips are, respectively, 41% and 62% lower in recent years compared to the long term. However, average landings, ex-vessel value, number of buyers, and ex-vessel price are higher in recent years (by 52%, 20%, 68% and 12%, respectively) compared to the long term.

Salmon landings peaked in 1988 and 2003 (at 3.4 and 3.9 million pounds, respectively), although ex-vessel prices and revenues were much higher in 1988 (\$3.81 per pound and \$13 million) than in 2003 (\$1.88 per pound and \$7.2 million). According to news reports at the time, the high price in 1988 was due to a strong market and mistaken predictions by fish buyers that salmon would be scarce that year

(Digitale 1990). Landings and value were at their lowest between 1992 and 1999, (6,700–259,000 pounds, \$19,400–\$229,000). In 1992, the fishery was closed north of Point Arena and remained constrained through the remainder of the decade.²⁵ Regulations were relaxed somewhat during the 2000s, except in 2006, when the Fort Bragg season was limited to five days. Nonetheless, recent average landings and ex-vessel value are, respectively, 52% and 20% compared to the long term.

The number of trollers landing at Noyo Harbor in the 1980s was quite high, peaking in 1982 (796 boats, just prior to the state limited entry program) and 1988 (740 boats, also the fishery’s record high revenue year). From 1981 through 1991, an average of 610 boats landed salmon at Noyo Harbor. Following the 1988 peak, the number of vessels declined to a low of 26 in 1992. Participation averaged 91 boats during the low-landing years 1992–1999, then increased to 167 boats through 2000–2007. Despite the recent upsurge, the average number

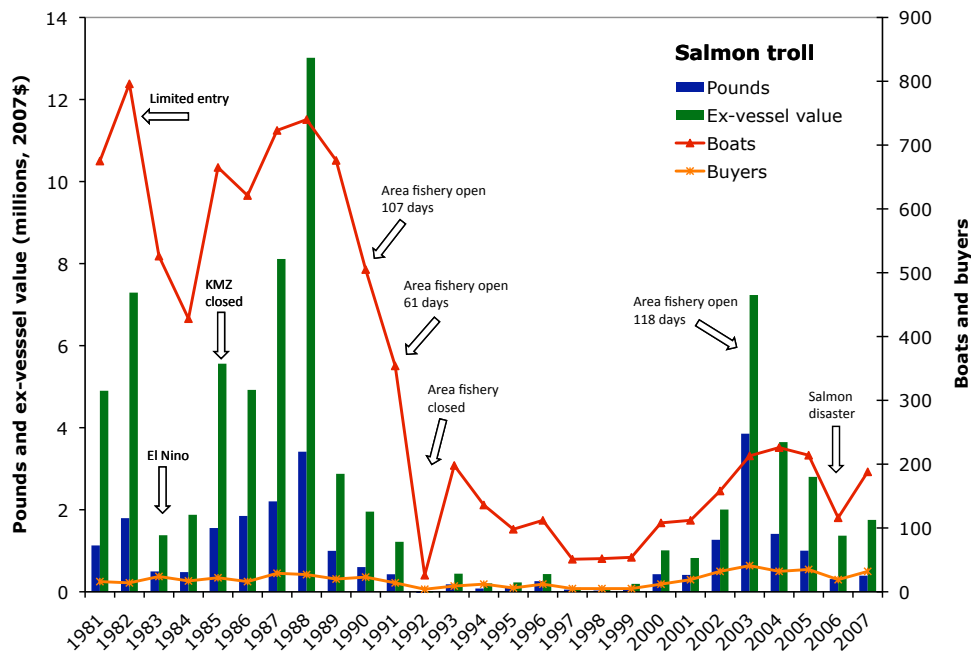


Figure 10. Landings, ex-vessel value (2007\$), and number of boats and buyers for the commercial salmon troll fishery at Noyo Harbor, 1981–2007.

Table 10. Long-term and recent annual average, percent difference, and highs and lows in selected measures for the commercial salmon troll fishery at Noyo Harbor, 1981–2007.

Salmon troll	Long-term average (1981–2007)	Recent average (2003–2007)	Percent difference	High year(s) (amount)	Low year(s) (amount)
Landings (lbs)	920,046	1,394,201	+52	2003 (3,853,867)	1992 (6,687)
Ex-vessel value (\$)	2,793,923	3,360,851	+20	1988 (13,016,951)	1992 (19,365)
Boats	325	191	-41	1982 (796)	1992 (26)
Buyers	19	32	+68	2003 (41)	1992 (4)
Trips	3,155	1,203	-62	1988 (13,128)	1992 (52)
Price (\$/lb)	2.88	3.22	+12	2007 (4.46)	2002 (1.58)

of boats in recent years (191) is 41% less than the long-term average (325), which reflects the influence of the high level of participation in the 1980s and measures to curtail it since.

As with boats, the average number of buyers (7) was lowest during the 1992–1999 period. However, unlike boats, buyer participation has been higher since 1999, (averaging 28 buyers for the period 2000–2007) than in the pre-1992 years (1981–1991, with an average of 20 buyers). These recent increases are perhaps partially due to an increase in fishermen marketing their own catch. The difference in the number of buyers in recent years relative to the long term (+68%) is greater than the increase in landings (52%) and value (20%) over the same periods.

Between 1981 and 1991, the number of salmon trips averaged 6,671 per year, peaking at more than 13,000 in 1988 before declining sharply to 52 trips in 1992. Between 1992 and 1999, the number of trips averaged 478, then increased to 998 through 2007. The decline in the number of trips in recent years relative to the long term was greater (-62%) than the decline in the number of boats (-41%), suggesting a tendency for boats to make fewer trips in recent years.

Ex-vessel salmon prices were strong through the 1980s, but declined through the 1990s to a low of \$1.58 per pound in 2002, due in part to increased

competition from farmed salmon (Sylvia et al. 1998). Since 2003, however, prices have increased, reaching record highs of \$4.41–\$4.46 in 2006–2007. Nonetheless, revenues in recent years have not achieved equivalent highs, due to limited seasons and very low landings.

The Dungeness Crab Pot Fishery

The crab pot fishery at Noyo Harbor has a variable history, owing in part to the cyclical nature of the resource and effort shifts among fisheries (Figure 11, Table 11; see also Figure 4). Although not as highly ranked as the groundfish, urchin and salmon fisheries, crab has ranked among the top five on most measures for the long term, and somewhat higher in recent years, especially as opportunities in other fisheries such as groundfish have declined.

Although highly variable, crab landings and ex-vessel value have shown a general upward trend over time, with recent averages 70% and 46% higher, respectively, relative to the long term.²⁶ Annual landings averaged 240,000, 416,000 and 529,000 pounds respectively during the periods 1981–1990, 1991–2000 and 2001–2007. Average revenues increased from \$541,000 to \$942,000 to \$1,018,000 over these same periods.

The numbers of boats, buyers and trips were, respectively, 5%, 34%, and 17% higher in recent

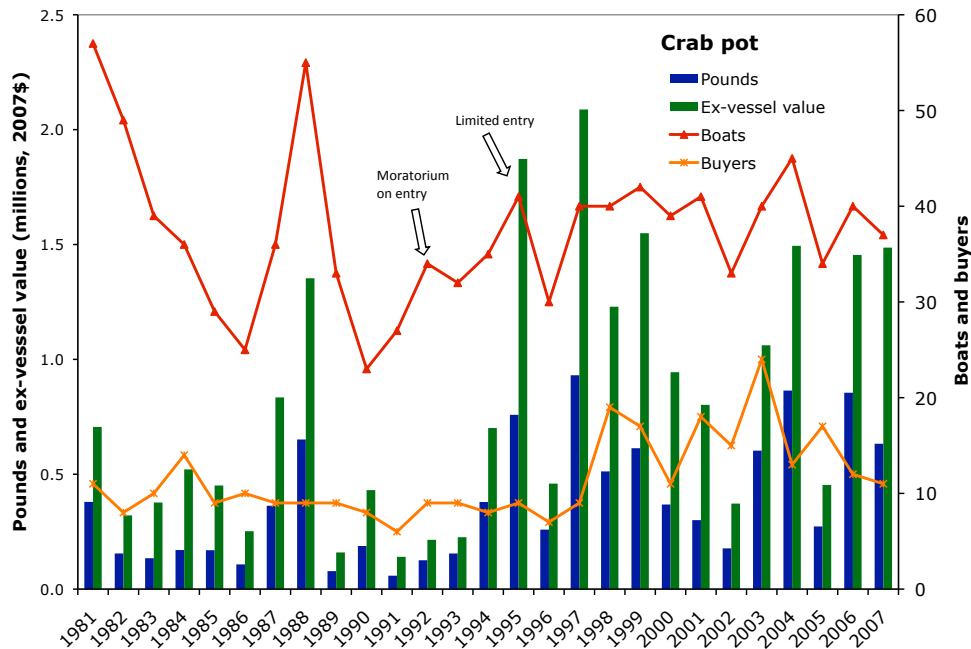


Figure 11. Landings, ex-vessel value (2007\$), and number of boats and buyers for the commercial Dungeness crab pot fishery at Noyo Harbor, 1981–2007.

years relative to the long term. Between 1981 and 1991, 23–57 boats per year landed crab at Noyo Harbor; between 1992 (when the moratorium on entry was implemented) and 2007, 30–45 boats participated in the fishery each year. Between 1981 and 1997, 6–14 buyers (averaging 9 per year) received crab at Noyo Harbor, increasing to 11–24 buyers through 2007 (averaging 16 per year). Between 1981 and 1993, the number of crab trips ranged from 138 to 517 (averaging 262 trips per year), increasing to 187–454 (averaging 351 trips) during the period 1994–2007.

Crab prices vary widely within and across years, depending on supply and demand, availability of buyers, and end product type (cooked and frozen versus live). Crab prices averaged \$1.84 per pound in recent years, 16% lower than the long-term average of \$2.18 per pound. The drop in crab prices may be attributed to the substantial growth in crab production, with the majority of landings still being purchased for the lower price cooked (rather than live) crab market. However, average annual prices increased between 2005 and 2007, from \$1.39 per pound to \$2.35 per pound, higher than averages for both the long

Table 11. Long-term and recent annual average, percent difference, and highs and lows in selected measures for the commercial crab pot fishery at Noyo Harbor, 1981–2007.

Crab pot	Long-term average (1981–2007)	Recent average (2003–2007)	Percent difference	High year(s) (amount)	Low year(s) (amount)
Landings (lbs)	380,078	645,472	+70	1997 (930,886)	1991 (58,461)
Ex-vessel value (\$)	813,124	1,189,974	+46	1997 (2,087,826)	1991 (140,530)
Boats	37	39	+5	1981 (57)	1990 (23)
Buyers	12	15	+34	2003 (24)	1991 (6)
Trips	308	359	+17	1981 (517)	1990 (138)
Price (\$/lb)	2.18	1.84	-16	1984 (3.06)	1993 (1.46)

term and recent years (\$2.18 and \$1.84 per pound, respectively).

The Sablefish Hook-and-Line/Pot Fishery

The sablefish (blackcod) hook-and-line (longline)/pot fishery has ranked among Noyo Harbor’s top five fisheries on most measures, with higher levels of activity in recent years relative to the long term. Although highly variable from year to year, average long-term and recent landings are similar, at a little more than 500,000 pounds (Figure 12, Table 12). Landings ranged between a low of 156,000 pounds in 1989 and a high of 1.2 million pounds in 1981. In recent years, landings peaked at 739,000 pounds (worth over \$1 million) in 2005.

Ex-vessel value of sablefish has varied widely, between a low of \$147,000 in 1989 and a high of \$1.5 million in 1997. Ex-vessel value averaged \$794,000 in recent years, 26% higher than the long-term average of \$632,000. Demand is largely driven by the Japanese market for product



and, to a lesser extent, the domestic fresh and live fish markets.

Vessel participation in the sablefish fishery has increased over time as opportunities in other fisheries have diminished. The number of sablefish boats averaged 37 in recent years, a 42% increase over the long-term average of 26 boats. Participation peaked at 85 boats in 1997, and has been more stable, with 33–43 boats participating annually (under both limited entry and open access permits) since 1998.

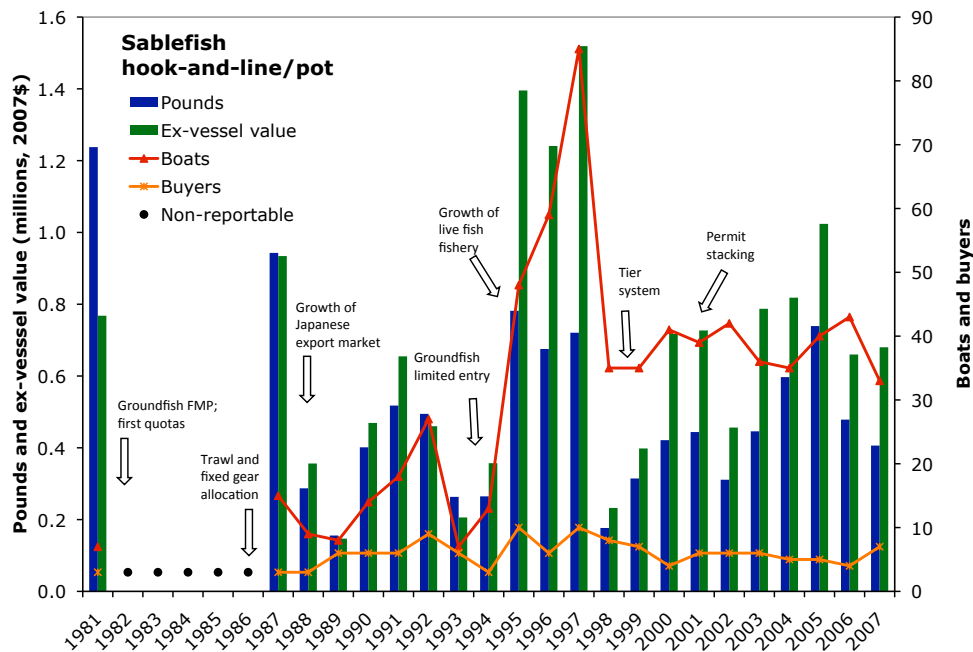


Figure 12. Landings, ex-vessel value (2007\$), and number of boats and buyers for the commercial sablefish hook-and-line/pot fishery in the Noyo Harbor, 1981–2007. Note: Activity cannot be reported for years when fewer than three boats or buyers participated.

Table 12. Long-term and recent annual average, percent difference, and highs and lows in selected measures for the commercial sablefish hook-and-line/pot fishery at Noyo Harbor, 1981–2007. Note: Years when more than zero but fewer than three boats or buyers participated (i.e., 1982–1986) are included in averages, but excluded from highs and lows.

Sablefish hook-and-line	Long-term average (1981–2007)	Recent average (2003–2007)	Percent difference	High year(s) (amount)	Low year(s) (amount)
Landings (lbs)	516,949	533,347	+3	1981 (1,237,676)	1989 (155,602)
Ex-vessel value (\$)	631,851	793,882	+26	1997 (1,519,010)	1989 (146,959)
Boats	26	37	+42	1997 (85)	1981, 1993 (7)
Buyers	5	5	0	1995 (10)	1983, 1987–88, 1994 (3)
Trips	507	579	+14	1995 (2,116)	1988 (28)
Price (\$/lb)	1.23	1.51	+23	1997 (2.11)	1981 (0.62)

Buyer participation in the fishery has been more modest, averaging five over the long term and in recent years. Between 1981 and 1990, an average of three buyers were active in the fishery. Since then, the average number of buyers has doubled, with as many as 10 receiving sablefish (in 1995 and 1997).

The average number of sablefish trips was 14% higher in recent years relative to the long term, increasing from an average of 49 in the 1980s to nearly 900 in the 1990s, when 500-pound trip limits led many fishermen to make 2–3 trips per day. The average number of trips declined to about 600 in the 2000s, as trip limits were replaced with cumulative limits for longer periods.

The average annual price per pound for sablefish was 23% higher in recent years compared to the long term. Prices have increased fairly steadily over time, from \$0.53–\$1.26 per pound during the 1981–1993 period to \$1.27–\$2.11 per pound during the 1994–2007 period.

The Rockfish/Lingcod Hook-and-Line/Pot Fishery

The hook-and-line/pot fishery for rockfish and lingcod at Noyo Harbor is relatively small in terms of landings and ex-vessel value,

averaging less than 2% of activity overall. However, the fishery ranks second in vessel participation for the long term, and fourth in vessel participation and third for buyer participation in recent years.

Development of the lucrative live fish market for certain rockfish species caused landings and value to accelerate rapidly to more than one million pounds worth \$2–3 million from 1987 through 1989 (Figure 13, Table 13). Although activity in the fishery then declined sharply through 1995, it increased again with renewed growth of the live fish market, with lower landings but markedly higher value reflecting the high price per pound for live fish. However, subsequent regulations, including highly constraining harvest limits on several species and implementation of restricted access in 2003 under the state’s Nearshore FMP, led to sharp curtailment of the fishery. In recent years, average annual landings and ex-vessel value (6,000 pounds and \$38,000) have been modest, and considerably lower (88% and 79%, respectively) compared to the long term. In recent years, landings and value ranged between 27,000 to 59,000 pounds worth \$100,000–\$176,000, respectively.

Fishing effort peaked during the period 1987–1989, with 335–372 boats making 1,160–1,322

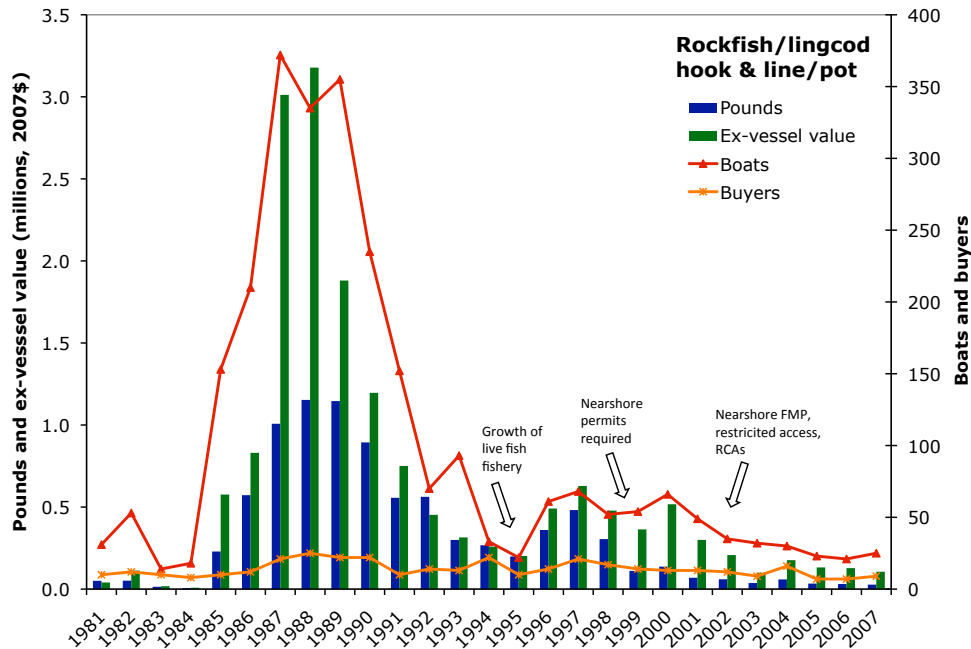


Figure 13. Landings, ex-vessel value (2007\$), and number of boats and buyers for the commercial rockfish/lingcod hook-and-line/pot fishery at Noyo Harbor, 1981–2007.

Table 13. Long-term and recent annual average, percent difference, and highs and lows in selected measures for the commercial rockfish/lingcod hook-and-line fishery at Noyo Harbor, 1981–2007.

Rockfish/Lingcod hook-and-line	Long-term average (1981–2007)	Recent average (2003–2007)	Percent difference	High year(s) (amount)	Low year(s) (amount)
Landings (lbs)	323,016	37,679	-88	1988 (1,153,025)	1984 (6,321)
Ex-vessel value (\$)	609,651	128,439	-79	1988 (3,177,956)	1984 (8,437)
Boats	99	26	-74	1987 (372)	1983 (14)
Buyers	14	10	-31	1988 (25)	2005 (7)
Trips	513	312	-39	1988 (1,322)	1981 (46)
Price (\$/lb)	2.23	3.51	+57	2001 (4.34)	1981 (0.80)

trips, falling to 21–32 boats and 214–413 trips in recent years (2003–2007). The number of buyers followed a similar pattern, increasing to 21–25 during the 1987–1989 period and falling to 7–16 in recent years.

Average annual price per pound fluctuated widely between \$0.80 to \$2.99 per pound during the period 1981–1988, narrowed to \$0.97–\$1.57 during the 1990–1998 period, and increased sharply to \$2.99–\$4.34 during subsequent years. In addition to market

conditions, average prices also reflect species composition and the relative proportion of live and dead fish in the catch.

Other Noyo Harbor Fisheries

Although not as central as some other fisheries, the albacore and shrimp fisheries have played an important role at Noyo Harbor from time to time and/or in the annual round of fisheries pursued by some fishermen. Because overall activity in these fisheries has been erratic, with fewer than three boats and/or buyers in several

years, reporting here is more limited. Albacore tuna is a highly migratory species whose distribution is affected strongly by oceanic conditions such as warm water currents (particularly El Niño events) and availability of prey. In some years, the fish migrate within 10 to 50 miles of the coast near Mendocino County; in other years, they are distributed much farther offshore and/or north off the coast of Humboldt and Del Norte Counties, Oregon and Washington. Although some of the catch is delivered at Noyo, some is delivered at ports north of California that have or are near canning facilities.

Albacore landings, ex-vessel value, boats and trips were extraordinarily high in 1981 relative to subsequent years (and the twelfth highest year for 1947–2007; see Figure 2). Following landings of nearly 900,000 pounds worth nearly \$1.6 million in 1981 made by more than 200 boats, activity dropped abruptly, reflecting a statewide contraction of the tuna fishery precipitated by the offshore relocation of major Southern California tuna canneries. During the period 1982–2007, landings averaged 69,000 pounds, ex-vessel value averaged \$77,000, and an average of 10 boats delivered and 6 buyers received troll-caught albacore at Noyo Harbor each year.

The trawl fishery for ocean (pink) shrimp started along the North Coast in the 1950s, with landings first recorded at Noyo in 1957 (Figure 2). Shrimp trawl activity has occurred in pulses, with deliveries in the late 1950s to 1962, 1975–1979, 1987–1990, and 1994–1997. Over the long term (1981–2007), landings averaged 214,000 pounds worth \$175,000 per year. (Trawl-caught shrimp were not landed in nine of those years, including 2003–2007). On average, five trawlers (including resident and nonresident operations) and two buyers participated in the fishery, with the number of deliveries averaging 23 per year. The average,



long-term ex-vessel price per pound was \$1.89, almost three times higher than at Eureka and Crescent City.

Commercial Fishery Combinations

Commercial fishery participants move among fisheries, ports and fishing areas in response to changes in resource availability, regulations, weather and other factors. For purposes of identifying trends in fishery participation, it would be reasonable to focus on boats that are resident (homeported) at Noyo Harbor. Although recent data on resident vessels were collected during fieldwork for this project, similar data for earlier years are not readily available. Thus, rather than focusing on resident vessels, we focus on those boats that earned a plurality (i.e., the greatest proportion) of their annual ex-vessel revenue from landings at Noyo Harbor. For the remainder of this section, ‘Noyo Harbor boats’ refers only to those boats that meet this plurality of revenue criterion. Although there may be some coincidence between these two methods of vessel classification, plurality of revenue is at best a rough criterion for identifying a vessel’s homeport, given the importance of mobility to the viability of many fishing operations. We identified 16 one-, two- and three-way fishery combinations common to these Noyo vessels during three periods: 1981–1983, 1993–1995 and 2005–2007 (Figure 14, Table 14). In Figure 14, the numbers in each box indicate the average number of vessels per year that participated exclusively in that fishery in

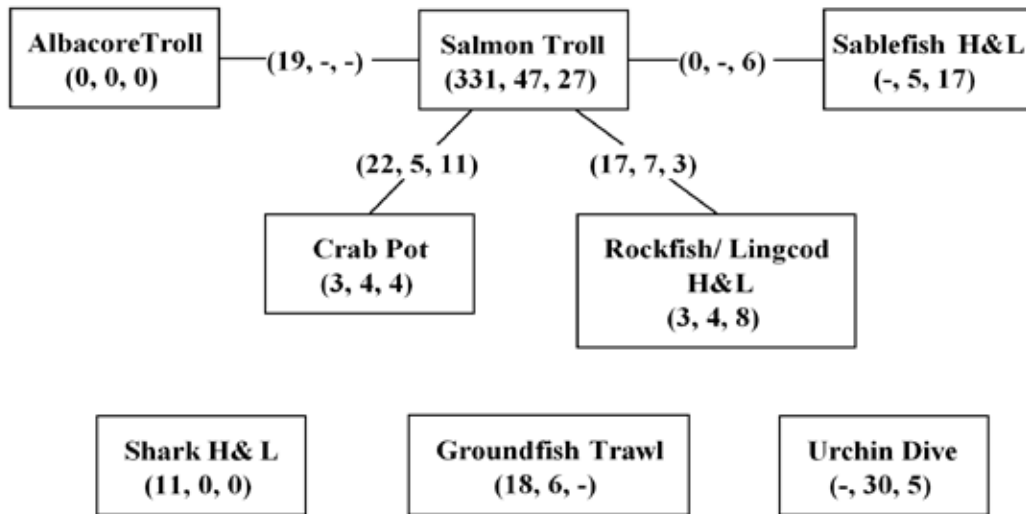


Figure 14. Major one- and two-way fishery combinations utilized by Noyo Harbor boats based on three-year averages for 1981–1983, 1993–1995 and 2005–2007. Note: “-” indicates fishery combinations involving only one or two boats, and cannot be reported. H&L = hook-and-line fishery.

Table 14. Major three-way fishery combinations utilized by Noyo Harbor boats in each of three periods. Note: “-” indicates fishery combinations involving only one or two boats, and cannot be reported. H&L = hook-and-line fishery.

Fishery Combination	1981–1983	1993–1995	2005–2007
	Average	Average	Average
Salmon Troll - Crab Pot - Albacore Troll	11	0	0
Salmon Troll - Crab Pot - Rockfish H&L/Pot	5	-	-
Salmon Troll - Crab Pot - Sablefish H&L/Pot	0	-	4
Groundfish Trawl - Crab Pot - Shrimp Trawl	0	3	0

each period. For example, an annual average of 331 boats participated only in the salmon troll fishery during the first period (1981–1983), 47 participated only in this fishery during the second period (1993–1995), and 27 participated during the third period (2005–2007). The numbers on the lines connecting two boxes indicate the average number of vessels that participated exclusively in the fisheries denoted by those two boxes. For example, the line connecting the salmon troll and crab pot boxes indicates that an annual average of 22 vessels participated in both the salmon and crab fisheries (only) during the first period, 5 did during the second period, and 11 did during the third period.

A number of fishery combinations that existed in 1981–1983 and 1993–1995 are no longer pursued (or are pursued by too few boats to report). Most notable is the drop in salmon-only operations, from an average of 331 boats during the first period, to 47 during the second period, and 27 during the third period. The numbers of salmon/albacore, salmon/rockfish, and salmon/albacore/crab boats also have declined substantially, while the number of sablefish-only boats has increased. Several study participants attributed this increase to the implementation of limited entry in many fisheries and the RCAs together with the reduction in salmon fishing opportunities. These changes notwithstanding, salmon-only

operations and those that occur in combination with other fisheries have consistently accounted for the majority of fishing operations at the port, even if their absolute numbers have declined. One local receiver noted that the small salmon day boats, which used to be very common at the port, “are mostly gone.”

The numbers of groundfish trawl-only and shark-only operations have clearly declined across the three periods. The number of urchin-only boats increased sharply from the first period, when no landings occurred, to 30 boats about 4–5 years after the fishery peaked in 1988–1989. Because of the high earnings potential in the local fishery at the time, some of the boats fishing out of Noyo Harbor (90%, according to one study participant) came from ports in Southern California. The number then dropped in the most recent period to five operations. According to a local urchin processor:

Sea urchin boats from Southern California came for the bonanza (in the mid-1980s) and left in the 1990s because the Japanese market favored Santa Barbara urchin quality and paid the best prices until [the early 2000s]. Some Fort Bragg (Noyo) divers spent most of their time there until 2007 (when market and resource conditions in the Northern California fishery improved).

The decline in the number of vessels participating in many of these combinations reflects the general downsizing of commercial fisheries at Noyo (as at other ports coastwide) as well as a number of fishery-specific events. Particularly noteworthy are the declines in the salmon troll and groundfish trawl fleets. Based on this analysis, increased participation in some fisheries – most notably sablefish and crab – appears to have modestly offset this overall fleet reduction.

Revenue Per Boat

While aggregate revenue at Noyo Harbor has declined from the peak of the late 1980s (see Figure 5), this trend is not necessarily indicative of how individual Noyo Harbor boats are faring in terms of revenue. To illustrate this point, we estimated the annual average ex-vessel revenue per boat for those boats that earned a plurality of their revenues from landings at Noyo Harbor.

Before 1992, the first year the salmon fishery off Fort Bragg was closed, the number of Noyo Harbor boats averaged 445 and ranged between 290 in 1984 and 564 in 1988, when the number of salmon and sea urchin fishery participants peaked (Figure 15). From 1992 through 2007, the number of such boats was considerably lower, averaging 134 and ranging between 100 and 181. In contrast, average annual revenue per boat (based on these boats’ landings at all ports) was consistently at or below \$30,000 between 1981 and 1986, increased to a high of \$92,400 in 1995, then shifted downward to \$47,000–\$62,000 during the period 1998–2007.

To better understand how vessel revenue is affected by fishery-specific participation, we assigned each Noyo Harbor boat to its ‘principal fishery’, that is, the fishery from which the boat earned the plurality of its annual revenue. For vessels associated with each principal fishery, we then estimated average annual revenue per boat (based on their landings at all ports and for all fisheries) for three periods: 1981–1983, 1993–1995 and 2005–2007 (Table 15).

The numbers of salmon trollers and groundfish trawlers declined consistently over the three periods, with trollers accounting for the vast majority of the overall decline in the Noyo Harbor fleet. The number of rockfish/lingcod and sablefish boats consistently increased over

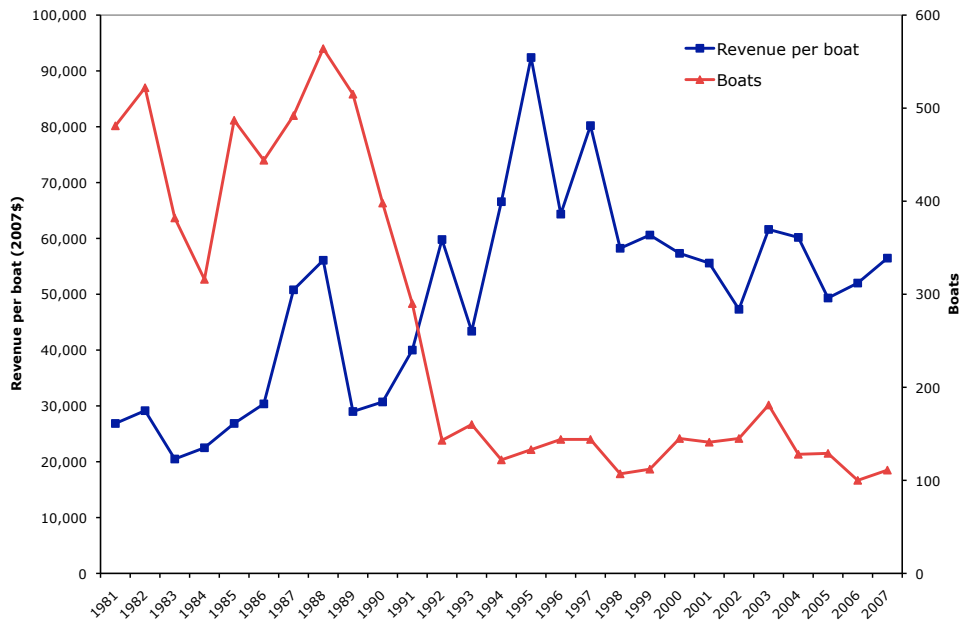


Figure 15. Number of boats with the plurality of revenue from landings at Noyo Harbor, and average annual revenue per boat, 1981–2007.

Table 15. Average annual revenue per boat (2007\$) for Noyo Harbor boats, by major fishery and overall, 1981–1983, 1993–1995 and 2005–2007. Notes: Data for urchin dive boats (1981–1983 average) are not reported to ensure confidentiality. At least 3 unique boats participated in each fishery during the three periods.

Principal Fishery	Number of Boats			Average Annual Revenue Per Boat (All Ports, All Fisheries, 2007\$)		
	1981– 1983	1993– 1995	2005– 2007	1981–1983	1993–1995	2005–2007
Groundfish trawl	22	11	6	262,382	401,973	260,142
Urchin dive		35	8		57,551	42,044
Salmon troll	404	57	52	10,284	3,748	29,169
Crab pot	10	16	13	41,427	81,986	99,903
Rockfish/Lingcod						
H&L/pot	2	6	11	1,116	11,514	7,871
Sablefish H&L/pot	2	9	22	420,584	103,718	38,919
Total	462	138	113	25,499	67,454	52,601

the three periods. Following no activity in the urchin fishery in the first period, the number of boats increased sharply in the second period, then declined substantially in the third period. Average annual revenue per boat varied widely among principal fisheries, with groundfish trawl,

crab, urchin and sablefish vessels having the highest revenue. Revenue per boat increased over the three periods for crab vessels, decreased for sablefish vessels, and peaked during the 1993–1995 period for groundfish trawlers and rockfish/lingcod vessels.

The changes in both numbers of boats and revenue per boat reflect changes in the composition and focus of the fleet. Even though salmon and groundfish continue to account for a substantial portion of the fleet's revenues, its emphasis on crab and sablefish has increased relative to the earlier periods examined here.



RECREATIONAL FISHERY ACTIVITY AT NOYO

Noyo Harbor and nearby Dolphin Isle Marina have long supported recreational ocean fisheries for salmon, groundfish and abalone, along with other species such as crab and halibut. The recreational fishery information presented here is based primarily on: 1) CPFV (commercial passenger fishing vessel, or charter) logbook data; 2) recreational salmon effort data (for CPFV and private boat modes) collected by CDFG and published by the PFMC; and 3) field data collected for this project. In addition, we use Noyo Harbor boat launch and CDFG abalone report card data to provide partial estimates of recent effort in those subsectors. Private boat catch and effort estimates for all fisheries are not available at the port level. The California Recreational Fisheries Survey (CRFS) data, which are available only at the district level, are used to place Noyo’s recreational fisheries in context.²⁷ In the discussion that follows, the *long term* represents 1980–2007, while *recent years* pertains to the most recent five years of the time series (2003–2007).²⁸ The CPFV trends described here must be viewed with caution because not all CPFV operators comply with the logbook requirement.

We use four measures of fishing activity derived from the recreational fishery landings data. ‘Boats’ are counted as the number of unique fishing vessels that operated in a given

year. A ‘boat trip’ represents a combined departure and return of a boat, regardless of trip length. An ‘angler trip’ is defined as one angler spending part or all of one or more days fishing before returning to the location where the trip began. An ‘angler day’ is defined as one person’s fishing on a given day. For example, two anglers each fishing for three days are counted as six angler days.

According to the CRFS, an annual average of 130,000 angler trips were made in the Wine District (which comprises Mendocino and Sonoma counties) between 2005 and 2007. About 52% of these trips were from private boats, 30% from beach or bank, 15% from shoreside structures, and 4% from CPFVs. While Noyo is an important hub of recreational activity, it is difficult to determine exactly how much of total recreational effort in the Wine District (all modes) originates from the harbor, as the CRFS does not provide effort estimates by port.

Charter Fishing Activity

Based on our analysis of CPFV logbook data, the average number of active CPFVs (eight boats) is the same for the long term and in recent years (Table 16). However, both the average numbers of boat trips and angler trips (1,027 and 12,914, respectively), are 54% and 44% greater in recent years compared to the

Table 16. Long-term and recent annual average, percent difference, and highs and lows in selected measures for CPFV fisheries at Ft. Bragg, 1980–2007.

	Long-term average (1980–2007)	Recent average (2003–2007)	Percent difference	High year(s) (amount)	Low year(s) (amount)
All fisheries	8	8	0	1989 (21)	1996, 1997 (4)
Boats	8	8	0	1989 (21)	1996, 1997 (4)
Boat trips	668	1,027	+54	2003 (1,167)	1993 (237)
Angler trips	7,225	12,914	+44	2004 (14,483)	1993 (1,871)

long term (668 boat trips and 7,225 angler trips).

A closer look suggests considerable variability over time (Figure 16). During the 1980s, an average of 10 CPFVs (range = 5–21) reported activity out of Noyo, with an average of 568 boat trips and 5,712 angler trips per year.²⁹ Activity decreased in the 1990s, most notably in terms of the number of boats (average = 6, range = 4–9), and less so in terms of the numbers of boat trip and anglers trips, which averaged 511 and 4,850, respectively. During the 2000s, the average number of boats increased modestly to eight, while the average numbers of boat trips nearly doubled (to 990) and angler trips nearly tripled (to 12,084). Note, however, that the number of boats and boat trips declined after 2003, and the number of angler trips declined after 2004.

Based on CPFV logbook data, charter activity out of Noyo Harbor has varied with larger Wine District activity, accounting for variable proportions of activity in the district over time and by measure. CPFVs at Noyo Harbor

accounted for an average of 44% of boats in the Wine District in the long term and slightly less (42%) in the recent term. However, CPFVs accounted for a greater proportion of boat days and angler days in the recent term (57% and 60%, respectively) compared to the long term (48% and 36%, respectively). Thus the share of regional CPFV activity originating from Noyo has also increased in recent years.

Private Boat Fishing Activity

Private boat fishing out of Noyo has focused largely on salmon, although anglers participate in several other fisheries, including rockfish, lingcod and halibut hook-and-line, albacore troll, crab pot and abalone dive. When salmon fishing opportunities are limited, private boat anglers rely more on groundfish – especially rockfish and lingcod – in the nearshore ocean fishery. However, since the late 1990s, groundfish fishing opportunities have become increasingly constrained by regulations. Several private boat anglers also target abalone during the seven-month season, diving at grounds located a few miles north and south of the harbor.

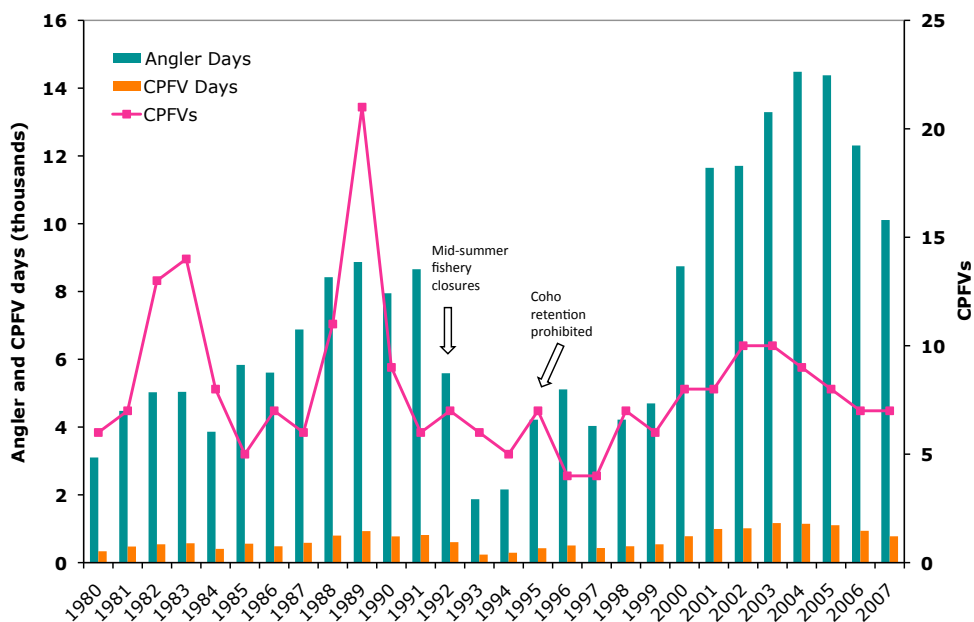


Figure 16. Angler days, boat days and number of CPFVs at Noyo Harbor, 1980–2007 (CPFV logbook data).

Although private boat catch and effort estimates are not available at the port level, other measures provide an indication of changes in effort in recent years. According to harbor district staff, the number of launches from harbor ramps declined from 3,500–3,600 during the period 2006–2007 to 1,350 in 2008 and 1,250 in 2009 as the salmon fishery was sharply curtailed and then closed. Harbor staff estimate 2.5 anglers per launch, for a high of 8,750 angler trips and a low of 3,125 angler trips per year between 2006 and 2009.³⁰ Kayak-based fishing has increased in popularity, with four shops currently providing rentals. The operator of one shop reported a marked increase in kayak rentals since opening in 2006, with about half rented to anglers, an estimated 90% of which are for ocean fishing and 10% are for inriver fishing.

Estimates of abalone effort (from charter and private boats) originating from Noyo Harbor can be derived from CDFG abalone report card data. According to CDFG staff, three sites are most likely primarily accessed by boat from Noyo Harbor: Pacific Mill, Todd’s Point and Hare Creek. An estimated 5,500–6,000 abalone dive trips occurred annually between 2002 and 2008 at these three sites combined, with little variation among years.



KEY FACTORS AFFECTING NOYO FISHERIES

Noyo's fisheries and fishing community have experienced considerable social and economic change over the past 30 years. Regulatory, market and environmental factors have influenced individuals and communities, sometimes gradually and at other times more abruptly. Some of these factors originated locally, while others are regional, national or even international in nature. Moreover, these forces do not operate in isolation. Rather, they interact in complex and cumulative ways, posing both challenges and opportunities to the viability and resilience of the Noyo fishing community. The following discussion focuses on specific factors highlighted by study participants as having most influenced local fisheries, infrastructure and the community.

Regulatory Factors

Salmon

The most significant regulatory factor affecting the Noyo fishing community has been variable and generally reduced access to salmon (Chinook and coho), especially since the late 1980s. The state's implementation of limited entry coupled with severe weather and poor fishing conditions in the early 1980s led to a sharp drop in salmon fishery activity at Noyo. In 1984, the commercial season in the adjacent northern management area (the KMZ) was cut from 104 to 67 days, and closed in 1985, while the season in the Fort Bragg area remained relatively unchanged at 153 days. This pattern of much greater restriction in the KMZ relative to Fort Bragg persisted through the 1980s. Local activity in Fort Bragg increased over that period, peaking in 1988, when nearly 4 million pounds of salmon with an ex-vessel value of more than \$13 million were landed. According to one study participant, many fishermen "migrated here from Eureka and Crescent

City...they spread down the coast with [the] closures." The fishery-support businesses at Noyo and in Fort Bragg that catered to commercial salmon fishermen – both local and transient – benefited as a result.

As with the commercial fishery, recreational ocean salmon seasons were considerably curtailed in more northerly California ports during the mid- to late-1980s. Recreational ocean salmon seasons in the Fort Bragg area, however, remained unchanged at 275 days (nine months) over that period (except 1989, when the season was reduced by one week).

In 1992, however, the commercial salmon fishery was closed from Point Arena north to the Oregon border, and the local recreational salmon season was reduced to 200 days (about 6½ months). Although the change in the recreational fishery was not nearly as dramatic as in the KMZ (where the season was cut to 14 days), it was closed during most of the summer, the traditional height of the season. Together, the commercial fishery closure and the reduced recreational season "brought Noyo to its knees" as demand for support goods and services such as fuel, ice, marine supplies and provisions dropped abruptly. According to local press at the time:

Don Bradley, chairman of the Noyo Port District ... estimates that the businesses serving the Fort Bragg fishermen have suffered a 60%–80% drop in income, one major marine supply store has closed, three fish processors have left and other related businesses are 'floundering'.... Harbormaster Howard Merritt said the restricted seasons deprive the port of thousands of dollars from visiting fishing boats. The port district stands in danger of being unable to pay its state loan (Digitale 1992).

Shoreside businesses that relied on sustained and considerable fishing activity from early spring through the fall suddenly were faced with substantial drops in activity. Through much of the 1990s the commercial season was open between 0–2 months per year, and landings were very low. For a fishing port whose history is inextricably tied to salmon, this new reality was hard to reconcile, both financially and socially. Those who remained in the fishing community adapted, some by shifting effort to other fisheries (and/or other livelihoods for additional income), others by altering inventories to serve the recreational sector. Over the past decade, the commercial salmon fishery off Fort Bragg has rebounded some, and a small contingent (by comparison with historical participation) of dedicated salmon trollers continues to depend on this fishery (often in combination with other fisheries) for their livelihood.

Groundfish

The groundfish fishery, considered by many to be a mainstay at the port due to its year-round, high volume activity, showed signs of decline during the 1980s and 1990s. Beginning in the late 1990s, the need for aggressive measures to rebuild overfished stocks and address overcapacity in the fishery prompted increasingly restrictive harvest measures, additional monitoring requirements, the establishment of rockfish conservation areas (RCAs) in 2002, and an industry-funded groundfish trawl buyback in 2003. The effect of these measures on Noyo (as with many other ports along the West Coast) has been fewer trawl vessels, fewer (and smaller) deliveries, a shift in species targeted, and fewer receivers and processors.

Five of the 12 Noyo-based trawlers participated in the 2003 federal West Coast groundfish trawl buyback. Trawl vessels use substantial volumes of fuel and ice for their

trips. The loss of these five operations at the harbor sharply reduced the need for fuel and ice, among other services. It also contributed to the eventual departure of a large nonresident groundfish and shrimp buyer, with financial implications for the local receiver used by that buyer, and further limited market options for fishermen.

The nearshore groundfish fishery also has been subject to increasingly strict regulation. According to one study participant:

In the early 1990s, they started cutting the quotas. There weren't enough fish for [local fishermen] to keep fishing. Then the live fish market started up. One fishery stopped and another started. Around 1995, there was a boom in the [live fish] fishery, then a decline with the RCA implementation, and California slashed its live fish fleet [with restricted access in the nearshore fishery] and cut quotas.

Despite these cuts, the live fish fishery and the hook-and-line fishery for groundfish as a whole persist at Noyo, with a small core group of fishermen who sell their catch to the local live fish buyer and/or directly to restaurants and markets in the San Francisco Bay area.

Recreational fishery participants noted that the combination of reduced salmon seasons and increasingly strict regulation of the recreational groundfish fishery since 2000 have affected their operations and the community overall. They reported less reliance on fishing for subsistence because of reduced seasons and catch limits, and noted that some local anglers have shifted from boat-based to shore-based fishing, where fishing is still possible year-round. According to a study participant knowledgeable of the fishery and the harbor,

“[Recreational fishing effort] was about 85% by boat versus 15% from shore in the past. Now, it’s more like 60–65% by boat and 35–40% from shore.... If there’s just rockfish fishing, locals pull their boats out. If there’s salmon, they’ll keep them in.”

Especially in more recent years, depth and time closures increasingly have been employed to manage the fishery and inseason closures have added to uncertainty about the length of the season and the timing of fishing opportunities. The 2008 closure of the nearshore recreational groundfish fishery four months early (on September 2) to protect yelloweye (*Sebastes ruberrimus*) and canary (*S. diploproa*) rockfish was difficult for community members, especially in light of the salmon closure. One participant summarized this change: “Ten or 15 years ago it was phenomenal. People didn’t have to plan [for seasons], they’d just come... Some would stay [in the area] for a month. Now seasons are inadequate [and] don’t mesh together. So people only come for a day or so.”

While these regulatory changes are intended to help sustain fish stocks, the resulting uncertainty also has made it difficult for fishermen, charter operators and other businesses to plan their activities and businesses (e.g., anticipate inventory needs and income potential). One study participant familiar with the charter industry noted that the substantially reduced (or eliminated) recreational salmon and groundfish fishery options have discouraged some visitors who might normally come to the area for a mix of activities (e.g., salmon and rockfish fishing and abalone diving).

Salmon is a word that’s key. If that’s closed, we lose 25% of our business. If there’s no opportunity to fish salmon, people won’t even book trips... Many people who would come here would go

for salmon in the morning and rockcod in the afternoon. For the fisherman and his wife to fish, that’s \$750 a day spent in the community. If you take 1,000 people away, that’s a lot of money!

Economic Factors: Costs, Prices and Revenues

Fishing operations have fixed and variable costs. Fixed costs include items such as vessels, gear and equipment (for navigation, safety and maintaining the quality of the catch), slip fees, permit fees, insurance and vessel maintenance and repair, which are required to keep their operations functioning safely and effectively. Variable (operating) costs include fuel, ice and other provisions, as well as crew. Fish buyers and processors, support businesses and the harbor likewise have fixed and variable costs including facilities, equipment, labor (and associated costs such as workers’ compensation), supplies, and maintenance and repair.

Commercial and recreational fishery participants and other community members cited rising costs such as fuel, insurance, and gear and vessel maintenance as a key factor affecting the fishing community. Of these, fuel costs were the most frequently cited. According to the PSMFC’s annual West Coast Marine Fuel Price Survey, average pretax fuel prices at Northern California ports increased nearly three-fold from \$1.22 per gallon in December 1999 to \$3.19 in December 2007, and about 21% between January and December 2007 (2007\$; PSMFC 2000, 2008). As one person noted, “If your fuel costs are coupled with reduced quotas, you can’t make the bottom line.”

Some commercial fishery participants commented on stagnant or declining prices in several fisheries. Based on our analysis of the landings data, this appears to be true

for urchin and crab prices, which have been lower in recent years relative to the long term (-54% and -16%, respectively). However, average annual ex-vessel prices (per pound) are greater for most other fisheries, including rockfish (+58%), sablefish (+23%), albacore (+18%), salmon (+12%) and groundfish trawl (+8%). These increases can be attributed in part to changes in market opportunities such as the live fish fishery, and efforts by fishermen such as freezing and boxing their fish at sea to enhance the quality of their product to supply higher end markets. Some study participants reported that they use such strategies to help offset increasing costs.

While overall commercial landings and revenues have declined in Noyo Harbor, this decline is not necessarily the case for all Noyo Harbor fishermen and fishing operations. Our estimates of average annual revenue per boat for boats that earned a plurality (i.e., the greatest proportion) of their annual ex-vessel revenues from landings at Noyo Harbor indicate a variable and complex pattern. Between 1981–1983 and 1993–1995, average revenue per boat increased while the average number of ‘Noyo Harbor boats’ decreased overall. Exceptions to this trend were the salmon and sablefish fisheries, where average ex-vessel revenues dropped sharply. Between 1993–1995 and 2005–2007, however, average ex-vessel revenues increased only in the salmon and crab fisheries, and declined in most other fisheries and overall.

The wide fluctuations in revenue trends are indicative of the substantial variability in resource availability, regulations and market factors within and across fisheries. As a result, it is not clear whether or how these revenue patterns are indicative of future trends. It is also unclear whether increases in revenue per vessel have kept pace with increasing costs.

Cumulative Effects of Change

The cumulative effect of reduced fishing activity on the Noyo fishing community has been an overall reduction in the number of fishery-support businesses and the continued deterioration of harbor infrastructure. Current local support business owners reported a reduction in sales of fuel, ice and other provisions, which they attributed in part to the trawl buyback, ongoing reductions in groundfish and salmon fishing activity, and the larger economic downturn. For the harbor, the reductions in commercial fishing opportunities and associated activity have led to a fundamental shift in berth occupancy from primarily commercial fishing vessels (80%–90% or more) through the 1990s to more than 50% recreational vessels in recent years. Although recreational fishermen generate revenues (from slip and launch fees) for the Harbor District, they tend to use fewer goods and services at the harbor. Since 2006, especially with the 2008 and 2009 salmon closures, overall berth and launch ramp usage have declined, although berth occupancy increased to 90% by June 2010 with the reopening of the salmon fishery. (However, most of these are monthly rather than seasonal rentals, which were the norm in earlier years.)

Study participants highlighted the importance of fishery-support infrastructure at Noyo, and discussed challenges to maintaining and enhancing waterfront infrastructure within the current regulatory and economic climate. Of critical concern was harbor maintenance (primarily dredging of the navigation channel and boat basin), continued access to fundamental goods and services, and public facilities for loading and unloading gear and associated activities.

Two provisions that are essential for most fishing operations are fuel and ice. At Noyo, there are currently two fuel docks, one at Noyo Harbor, the other at Dolphin Isle Marina. Only the Noyo Harbor fuel dock is accessible to deep-draft vessels. Some boats in the trawl fleet, which uses higher volumes of fuel, receive fuel delivered by truck from Mendocino Coast Petroleum. Given the reduced level of fuel use following reductions in vessel activity at Noyo, neither of these operations is self-sustaining.³¹ Since 2006, the ice plant has been subsidized by the Point Arena Submarine Cable Committee. This support has been essential to the plant's continued operation, although the owner remains concerned about its future:

We have to sell ice to make money, and we need fish for that. When they cut the season, sales decline, you don't do repairs, and so on. We're way behind on ours. We kept up maintenance the last [few] years, but now I'm not sure [what will happen].

Many fishermen expressed concern about the vulnerability of local infrastructure, noting that the viability of local fisheries and the fishing community depends on a certain level and diversity of activity. Without access to these and other fundamental services, resident fishermen may be left with two choices: quit fishing or take their operations elsewhere:

Shoreside infrastructure is directly proportional to community size. In the 1970s, 1980s there were a lot of support businesses – seven major receivers, four [of which] processed and had a high number of employees, and trucks to haul [the product] to market. When the industry was curtailed, many support businesses left, so the fishermen that are [here] now don't have enough support.

It sounds good to have two fishermen making money versus 10 fishermen starving, but the two fishermen can't support the community.

A major challenge facing the port is the ongoing need for dredging the harbor entrance, navigation channel and boat basin. Periodic dredging by the Army Corps of Engineers has occurred since the 1930s (U.S. Army Corps of Engineers San Francisco District 1975). Maintenance has been delayed in recent years due to limited federal funding and the need for additional dredge disposal capacity. Emergency dredging was done in 2006 after U.S. Coast Guard vessels had to “wait out a storm” in Noyo Cove, with the cost shared by the County Office of Emergency Services (75%) and the Harbor District (25%), as federal funds (via the Corps of Engineers) were not forthcoming. In 2009, dredging funds finally were obtained after a fishing vessel scraped bottom trying to enter the river channel.³² Dredging of the harbor entrance and navigation channels was completed in October 2009; however the boat basin and some other areas still need to be dredged (Korbell 2010). The harbor district is considering a 20-year plan for dredging, and hopes to find another site for approximately 400,000 cubic yards of dredged material.

Siltation further upriver and at Dolphin Isle Marina also has presented a challenge to fishermen and marina operators. Dredging has not been done since the 1960s, and the need to maintain access to the marina and slips is now critical. According to the manager, the shallow draft, which has a maximum of about nine feet on a spring tide, affects both commercial and recreational fishery participants, as well as the marina: “we are very limited to the smaller sized vessels.”

CURRENT SITUATION AND OUTLOOK

The Noyo fishing community faces challenges as it continues to adjust to changes in fishing opportunities brought about by variable and uncertain regulatory, economic and environmental conditions. The cumulative effects of reduced opportunities in the salmon and groundfish fisheries, recent high fuel costs, and the broader economic downturn have put a strain on the community. Reduced revenues together with regulatory and economic uncertainty have made it difficult for local commercial fishermen and business owners to plan for and invest in their operations. A smaller fleet of active commercial fishermen and a much-reduced number of resident receivers, processors and fishery-support businesses remains. The harbor, once dominated by commercial fishing, is now more dependent on the recreational sector. At the same time, the narrowed range of fishing options (along with the recent general economic downturn) has deterred some nonresident anglers from visiting, which ultimately affects the larger Fort Bragg service industry and community as well. Other sport fisheries for groundfish, crab and abalone continue, but have not filled the void left by salmon.

Maintaining a working waterfront to service commercial and recreational fisheries is a critical concern, both for the functionality of the fleet and to preserve the area's maritime heritage. The reductions in fishing opportunities and activity have reduced shoreside activity and associated revenues, which in turn have affected fishery-support businesses and the harbor itself. With only a core group of support businesses remaining, fishery participants are concerned about the further loss of this infrastructure to the point that Noyo can no longer support fishing

In addition, the need for dredging of the navigation channels and basins is acute, both for residents (including the Coast Guard), and for transient users seeking provisions, services and refuge from often dangerous ocean conditions while traveling the coast.

In addition, study participants are concerned about three larger policy events that have the potential to fundamentally change local fisheries and the community. First, the state's Marine Life Protection Act (MLPA) process, begun in late 2009, is moving forward to establish a network of marine protected areas (MPAs) in the North Coast region (Point Arena, located just south of Fort Bragg, to the Oregon border). In Fall 2009, the Mendocino County citizens formed the Mendocino Ocean Community Alliance to coordinate participation and input into the North Coast MLPA process. Meanwhile, local fishermen must adapt to recently implemented MPAs in the North-Central Coast region (from Pigeon Point to Point Arena), which took effect on May 1, 2010. For example, one sea urchin processor noted:

In 2009, 48% of the sea urchin processed in our plant came from between Point Arena and Bodega Bay. The North-Central closures due to the MLPA will decrease these landings 20% or more by my estimation due to the loss of key, most productive areas.

Second, an individual quota program for the federal groundfish trawl fishery, to be implemented in 2011, has raised concerns among some about potential conflicts should effort shift from the trawl fishery into other fisheries, and infrastructure losses if vessels and/or catch shares ultimately leave the area

(or the fishery). Finally, potential offshore renewable energy development could further reduce access to customary fishing grounds. The Federal Energy Regulatory Commission (FERC) has issued two preliminary permits for wave energy development offshore from Fort Bragg. The Pacific Gas and Electric Company recently surrendered its permit when studies showed that Noyo Harbor infrastructure is inadequate to support the deployment of wave energy devices. The second permit, issued to Green Wave Energy Solutions LLC for a 17-square-mile area just south of Fort Bragg, is in litigation in the U.S. Ninth Circuit Court

of Appeals (Fishermen Interested in Safe Hydrokinetics v. FERC, No. 09-72920; E. Mitchell, pers. comm.).

These issues, in conjunction with generally declining and highly variable fishing opportunities, pose serious challenges to the viability of the Noyo fishing community. Yet they also have fueled the determination and adaptability of individuals, families and businesses to confront those challenges, and identify opportunities for sustaining their livelihoods and heritage.

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ENDNOTES

- ¹ Fishing is also important to the communities of Albion and Point Arena, as are shore-based ocean, inland and river fisheries and other collecting activities - both tribal and nontribal - to the community and the region. However, these are beyond the scope of this report.
- ² See Appendix C for methodological detail.
- ³ Reports of the number of berths vary across sources and over time.
- ⁴ Mild curing consists of splitting (rough filleting) and salting salmon and storing it in wooden barrels. Fish processed in this way could be kept indefinitely in cold storage, but was usually sold and consumed within a year (Ponts 1965).
- ⁵ Grader's son Zeke wrote of growing up in Fort Bragg in the mid-1950s: "The mooring basin was still 10 years away and to protect the boats from being washed to sea during the winter freshets, when the river would surge with muddy water and debris from logging operations upstream, most would haul their boats out for the winter and the boat yards were as much for storage as they were for repair or maintenance" (Grader 2005).
- ⁶ Young (1969) reports these data as 'angler days' for 1947–1960, and 'anglers' for 1960–1967. Based on the overlap, they appear to be equivalent measures.
- ⁷ According to one long-time receiver/processor, there were seven seafood processing plants at that time.
- ⁸ Federal fishery disaster declarations afford affected fishery participants and coastal communities access to economic aid to help them deal with poor economic conditions in a fishery and/or a stock collapse. Such federal disaster relief assistance programs have been in place since the 1960s.
- ⁹ The tribal allocation was upheld in *Parravano v. Babbitt*, 70 F.3d 539 (9th Cir. 1995), cert. denied, 518 US. 1016 (1996).
- ¹⁰ Another 3 million pounds were landed at nearby Albion and Point Arena that year (Anon. 1994).
- ¹¹ See Ralston (2002) for a discussion of the biology of West Coast groundfish and how growing understanding of that biology affected PFMC management.
- ¹² See Appendix B for a glossary with definitions of this and other key terms used throughout this report. Pacific ocean perch, bocaccio and lingcod were declared overfished in 1999, canary rockfish and cowcod in 2000, darkblotched and widow rockfish in 2001, and yelloweye rockfish in 2002. Lingcod was declared rebuilt in 2005.
- ¹³ Vessel monitoring systems are electronic transmitters placed on fishing vessels that transmit information about a vessel's position to enforcement agencies via satellite to determine, for example, whether a vessel is in a closed area.
- ¹⁴ See Leet et al. 2001 and Starr et al. 2002 for descriptions of these fisheries and gear types.

- ¹⁵ Most Fort Bragg urchin boats carry two divers.
- ¹⁶ Over time, a succession of organizations, beginning with the Director’s Sea Urchin Advisory Committee (DSUAC, established in 1987) through the current CSUC, has represented California’s sea urchin fishery participants. Halmay, P. 2009. A new beginning for the California Sea Urchin Commission. CommUNItY. Sacramento, CA: California Sea Urchin Commission. 1,4.
- ¹⁷ The salmon barbecue was initiated by the fishing community in 1971 to support hatchery production. With the curtailment of the salmon fishery and the growth of tourism, however, the barbecue has become more of a tourism event, attracting 2,500–3,000 people and raising \$30,000–\$40,000 to support restoration activities. The event also is a U.S. Library of Congress ‘Local Legacy Project’ (<http://www.salmonrestoration.com/>).
- ¹⁸ The 1981 start date for this analysis is based on the availability the Pacific States Marine Fisheries Commission’s (PSMFC) PacFIN database, which integrates Washington, Oregon and California commercial fishery landings data to provide a consistent coast-wide electronic record of landings from 1981 forward. The PacFIN data for California are based on the C-MASTER data provided by CDFG to the PSMFC.
- ¹⁹ Throughout we abbreviate the names of these fisheries as follows: albacore for albacore troll, crab for crab pot, rockfish for rockfish/lingcod hook-and-line/pot, sablefish for sablefish hook-and-line/pot, salmon for salmon troll, shrimp for shrimp trawl, and urchin for urchin dive.
- ²⁰ An entity is counted as a buyer in a given year if it receives at least one delivery. In reality, the number of active buyers capable of regularly receiving the catch from multiple boats is considerably smaller.
- ²¹ Because multiple species may be caught during a fishing trip, trips are measured by assigning each delivery to the fishery accounting for the greatest (i.e., plurality of) ex-vessel value associated with that delivery. In some cases, fishing for particular combinations of species and/or using multiple gear types on a single trip is prohibited.
- ²² Consolidation refers to the concentration of fish catch or fish receiving among a smaller number of entities.
- ²³ Although 2005–2007 PacFIN data cannot be reported (because of confidentiality requirements), data published in CDFG’s 2008 report on the fishery indicate an increase in fishery activity at Noyo in recent years as follows: 648,277 pounds (2005), 532,208 pounds (2006), 871,870 pounds (2007) and 1,373,499 pounds (2008 preliminary data; <http://www.dfg.ca.gov/marine/seaurchin/report2008.asp>, accessed 8/3/10).
- ²⁴ The recent CDFG report on the fishery indicates an overall increase in the number of receipts (or deliveries) at Noyo in recent years, with 772 deliveries in 2005, 639 in 2006, 898 in 2007 and 1,178 in 2008 (preliminary data; (<http://www.dfg.ca.gov/marine/seaurchin/report2008.asp>, accessed 8/3/10).

- ²⁵ The fishery was open south of Point Arena for 153 days, so that fishermen could land their catch at Noyo at the end of the season or before transiting north to continue fishing and delivering at ports north of the closed areas.
- ²⁶ Note that crab season straddles the calendar year (December through July), and most landings occur within the first one to two months of the season (Hankin et al. 2001). As a result, activity reported for a given year may not correspond to that of a season, *per se*. We analyzed the data by calendar year for consistency with analyses for other fisheries, most of which have seasons that lie within the calendar year.
- ²⁷ The CDFG initiated the CRFS in 2004 to continue and fine-tune research conducted through NMFS' coastwide Marine Recreational Fisheries Statistical Survey since 1980 to document and estimate recreational fishing effort (<http://www.dfg.ca.gov/marine/crfs.asp>, <http://www.recfn.org/pcmrfss.htm>). The CRFS provides comprehensive estimates of effort and catch for all recreational fishing modes and species. (Modes are the locations/facilities anglers fish from, and include: manmade structures, beaches and banks, CPFVs (or charter boats), and private boats.) See Regional Profile for a discussion of recreational fishing in the larger North Coast region.
- ²⁸ The 1980 start date for this analysis is based on the availability of electronic CPFV logbook data.
- ²⁹ The peak of 21 CPFVs in 1989 should be viewed with caution. Study participants report about six active CPFVs at that time, with remainder likely operating temporarily as charters in an effort to adapt to the increasing constraints on commercial salmon fishing. Subsequent changes in rules pertaining to fishing commercially and recreationally from the same vessel and U.S. Coast Guard passenger vessel safety requirements prompted a return to numbers observed in most earlier years.
- ³⁰ As of June 30, 2010, 744 launches had been made from Noyo Harbor, for an estimated 1,860 angler trips for the year to date.
- ³¹ According to study participants here and at other ports, fuel sales have a very small profit margin, so that it takes substantial volume of sales to support such an operation independently.
- ³² http://www.spn.usace.army.mil/press_release/PR-2009-08-06_August_Corps_Awards_Contract.html, accessed 3/29/10.

APPENDIX A: ACRONYMS

ASBS	Area of Special Biological Significance
CBP	County Business Patterns
CCA	Critical Coastal Area
CDFG	California Department of Fish and Game
CPFV	Commercial passenger fishing vessel
CRFS	California Recreational Fisheries Survey
EFH	Essential Fish Habitat
FMP	Fishery Management Plan
KMZ	Klamath Management Zone
MLMA	Marine Life Management Act
MLPA	Marine Life Protection Act
MRFSS	Marine Recreational Fisheries Statistical Survey
MSA	Magnuson-Stevens Fishery Conservation and Management Act
MSY	Maximum sustainable yield
NAICS	North American Industrial Classification System
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
OSP	Ocean Salmon Project
OY	Optimum yield
PacFIN	Pacific Fisheries Information Network
PFMC	Pacific Fishery Management Council
PSMFC	Pacific States Marine Fisheries Commission
RCA	Rockfish Conservation Area
RecFIN	Recreational Fisheries Information Network
SFA	Sustainable Fisheries Act
VMS	Vessel monitoring system
YRCA	Yelloweye Rockfish Conservation Area

APPENDIX B: GLOSSARY

(See <http://www.pcouncil.org/resources/fact-sheets/> for additional terms and definitions)

Area of Special Biological Significance (ASBS) – Ocean areas monitored and maintained for water quality by the State Water Resources Control Board due to their unusual variety of aquatic life and unique individual species.

Commercial Passenger Fishing Vessel (CPFV) – A sport fishing vessel operated by a hired skipper, on which anglers pay a fee to fish. A **fishing charter**, a type of CPFV, usually refers to a boat carrying a prearranged group of anglers, although the term often is used interchangeably with CPFV. **Party boat** usually refers to a boat carrying a group of anglers that has not been prearranged.

Critical Coastal Area (CCA) – A coastal watershed designated by California’s Critical Coastal Area Program for focused coordination of resources and efforts by government agencies and stakeholders to protect it from polluted runoff through the development and implementation of community-based CCA Action Plans. Trinidad Head is one of five CCA pilot project sites.

Essential Fish Habitat (EFH) – Those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.

Ex-vessel Value – The value of the catch based on the price paid to fishermen when they deliver it to the first shoreside buyer; also referred to as “landed value.” Ex-vessel value does not account for the value added by processing, wholesaling, or retailing the seafood products.

Federal Fishery Disaster – A determination by the federal government that fishermen have endured economic hardship resulting from poor economic conditions in the fishery and/or a stock collapse. A federal fishery disaster declaration allows for the allocation of economic aid to affected states and fishing communities.

Fish Buyer – A person or business that is licensed by the state to purchase fish directly for commercial purposes from a commercial fisherman, also referred to as a **fish receiver**. In the PacFIN landings data used in this report, fish buyers or receivers include those individuals and businesses that purchase fish from fishermen, *and* fishermen who sell their catch directly to the public off the boat or by other means.

Fish House – A seafood production firm or facility that processes and wholesales seafood.

Fisherman – A person (man or woman, captain or crew) involved in the capture of finfish or shellfish.

Fishery – All of the activities involved in catching fish (including shellfish).

Fishery Participant – A person who owns, operates or works in a fish business (fishing, buying, processing, etc.) or who fishes for sport or subsistence.

Fishery Support Business (FSB) – A business that provides goods and services needed for the safe and effective operation of fishing, receiving and processing businesses.

Fishing Community – A community that is substantially dependent on or substantially engaged in the harvest or processing of fishery resources to meet social and economic needs. Includes fishing vessel owners, fishing families, operators, crew, recreational fishers, fish processors, gear suppliers and others in the community who depend on fishing.

Fishing Operation – A business involved in fishing that includes the fishing vessel and its gear, the skipper and crew.

Fish Processor – A person or business that modifies seafood (e.g., filleting, freezing, drying, smoking, canning, packaging, value-added) and sells the resulting products to businesses other than the ultimate consumer.

Groundfish – Fish living on or near the sea bottom. The federal West Coast Groundfish Fishery Management Plan includes more than 82 species of rockfish, finfish, roundfish, sharks and skates and selected other species.

Harvest Guideline(s) – A numerical harvest (or catch) level, in terms of numbers of fish or poundage (landings) that is a general objective, but not a quota, in fishery management. Under federal fishery management guidelines, attainment of a harvest guideline does not require a management response, but it does prompt review of the fishery.

Infrastructure – The physical buildings, other structures and equipment and associated businesses that operate them, necessary to the safe and effective conduct of an activity such as fishing.

Klamath Management Zone (KMZ) – The commercial ocean and river salmon fishing area from Humbug Mountain, Oregon, to Horse Mountain, California, in which harvest of Klamath River salmon is regulated by the Pacific Fishery Management Council.

Magnuson-Stevens Fishery Conservation and Management Act (MSA) – The federal law that created the regional councils and is the federal government's basis for fisheries management in the Exclusive Economic Zone. Also known as the Magnuson Act.

Maximum Sustainable Yield (MSY) – The largest long-term average catch or yield that can be taken from a stock or stock complex under prevailing ecological and environmental conditions.

Optimum Yield (OY) – The amount of fish that provides the greatest overall benefit to the nation on the basis of MSY, as reduced by relevant economic, social and ecological factors; provides for the rebuilding of any overfished fishery to a level consistent with producing the MSY.

Overfished – As defined by the MSA in 1996, the status of a fish stock that has been determined to be smaller than the sustainable target set by the National Marine Fisheries Service.

Overfishing – refers to a situation where a fish stock is being fished at a fishing mortality rate that jeopardizes the capacity of a fishery to produce the MSY on a continuing basis.

Skipper – The captain of a vessel, although not necessarily the owner.

Spawner Escapement Floor – The minimum number of fish that are required to arrive at a natal stream or river to spawn, as identified in a management process.

Sustainable Fisheries Act (SFA) – The Act passed in 1996 that reauthorized and amended the MSA.

Vessel Monitoring System (VMS) – An electronic device placed on fishing vessels that transmits information about a vessel's position to enforcement agencies via satellite to determine, for example, whether a vessel is in a closed area.

APPENDIX C: METHODOLOGICAL DETAIL

Customization of PacFIN Landings Receipt Data to Characterize Commercial Fisheries

State and PacFIN Landings Receipts

Washington, Oregon and California (W-O-C) require first receivers to submit receipts for all commercial landings made in those states. Information recorded on landings receipts includes (but is not limited to) vessel ID, date and port of landing, landed weight by gear and species/species group, ex-vessel price, and receiver ID. The Pacific States Marine Fisheries Commission manages W-O-C landings receipt data collected since 1981 as part of its PacFIN program.¹ One of PacFIN's responsibilities is to standardize each state's landings receipt data, to make it comparable coastwide. For instance:

- Vessel IDs reported on landings receipts are registration numbers assigned by state fishery agencies to individual vessels. While these numbers uniquely identify a vessel within a state, use of these identifiers for coastwide analysis can lead to double counting of vessels that land fish in multiple states. To address this issue, PacFIN replaces the state registration numbers with a unique identifier consisting of (a) the Coast Guard documentation number for vessels of five net tons or more, or (b) the state marine board number assigned by the state Department of Motor Vehicles for vessels of less than five net tons (which are not subject to Coast Guard documentation).
- PacFIN converts each state's numeric port codes to a common set of alphanumeric PacFIN codes (e.g., CRS = Crescent City, ERK = Eureka, BRG = Fort Bragg).

- PacFIN converts each state's species codes to alphanumeric 'market categories' (e.g., CHNK = Chinook salmon, DCRB = Dungeness crab, SABL = sablefish). Each market category consists of a single species or a group of taxonomically similar species that receive the same ex-vessel price in a given landing. PacFIN also assigns individual market categories to species complexes and management groups, as appropriate, to facilitate fishery management and monitoring.
- PacFIN converts each state's gear codes to a common set of PacFIN gear codes (e.g., MDT = midwater trawl, SEN = seine, CPT = crab pot). These gear codes are further aggregated into gear groups (e.g., TWL = all trawls except shrimp trawls, NET = all net gear except trawl, POT = all pot and trap gear).
- In addition to providing the landed weights reported on the landings receipts, PacFIN converts landed weights to round weight equivalents for species that are typically not landed in the round (e.g., salmon, sablefish).

Customization of PacFIN Landings Receipts

For the regional and port profiles, fishing activity was characterized in terms of effort (vessels and trips), landings, ex-vessel value, prices, and buyers (first receivers), by fishery. Although the profiles pertain to North Coast ports, all W-O-C landings receipts were analyzed to ensure that information on fishery participation and average per-vessel revenue for vessels landing fish at North Coast ports included their participation in all fisheries in all West Coast states.

In order to provide the detailed fishery-specific information needed for the profiles, 1981–2007 PacFIN landings receipt data for W-O-C were customized as follows:

- A ‘fishery’ was defined as a particular combination of a market category (or categories) and gear group. Thirty-four fisheries were defined in this manner: (1) coastal pelagic species seine, (2) squid seine, (3) salmon troll, (4) salmon net, (5) herring gillnet/dive, (6) swordfish drift gillnet, (7) swordfish longline, (8) swordfish harpoon, (9) albacore troll, (10) tuna seine, (11) tuna longline, (12) shark gillnet, (13) shark hook-and-line, (14) nonwhiting groundfish trawl, (15) whiting trawl, (16) rockfish gillnet, (17) halibut hook-and-line, (18) halibut set net, (19) rockfish/lingcod hook-and-line/pot, (20) sablefish hook-and-line/pot, (21) cucumber net/trawl/dive, (22) urchin dive, (23) crab pot, (24) lobster pot, (25) shrimp/prawn trawl, (26) shrimp/prawn pot, (27) abalone dive, (28) other shellfish dredge/digger, (29) sturgeon gillnet, (30) white seabass/yellowtail gillnet, (31) white croaker gillnet, (32) eulachon net, and (33) hagfish pot, and (34) all else. The 33 specific fisheries identified above were sufficiently comprehensive of W-O-C fishing activity that only modest amounts of activity had to be relegated to the 34th ‘all else’ category. Depending on the year, 1.1%–3.4% of boats, 1.0%–6.0% of trips, 0.2%–1.9% of landings, and 0.5%–1.5% of revenue were assigned to the ‘all else’ category.
- A ‘fishing trip’ was defined as a unique vessel ID-date of landing combination. While it is possible for a vessel to make multiple trips on a single date, it is not possible to identify instances of multiple trips from PacFIN, as landings receipts include information on the date but not the time of landing. Thus numbers of trips, as defined by vessel ID and date, may underestimate actual trips (although the extent of such underestimation is believed to be slight).

Once defined, each fishing trip was characterized in terms of total landings and revenue, and assigned to a fishery, receiver (or buyer) and port as follows:

- A fishing trip may involve participation in more than one fishery (e.g., setting/retrieving crab pots and groundfish trawling). For purposes of this report, each trip was assigned to the fishery accounting for the plurality of revenue derived from the trip. For 86% of the trips made between 1981 and 2007, 100% of trip revenue was attributable to a single fishery. For an additional 8% of trips, the fishery to which they were assigned accounted for 90%–99% of trip revenue.
- A vessel may deliver fish to multiple receivers after a given trip. For purposes of this report, each trip was assigned to the receiver accounting for the plurality of revenue from the trip. About 4% of trips made during the period 1981–2007 involved deliveries to multiple receivers.
- On occasion, a vessel may deliver fish at multiple ports upon returning from a fishing trip. For purposes of this report, each trip was assigned to the port accounting for the plurality of revenue for the trip. About 1% of trips made between 1981 and 2007 involved deliveries to multiple ports.

Data Series from U.S. Bureau of the Census

County Business Patterns

The County Business Patterns (CBP) data series provides annual, county-level information on economic activity by businesses with paid employees.² Activity is described in terms of mid-March employment, first-quarter payroll, annual payroll, and number of establishments. According to the U.S. Census:

- “Payroll numbers include all forms of compensation such as salaries, wages, reported tips, commissions, bonuses, vacation allowances, sick-leave pay, employee

contributions to qualified pension plans, and the value of taxable fringe benefits. For corporations, it includes amounts paid to officers and executives; for unincorporated businesses, it does not include profit or other compensation of proprietors or partners. Payroll is reported before deductions for Social Security, income tax, insurance, union dues, etc. . . . First-quarter payroll consists of payroll during the January-to-March quarter.”

- Mid-March employment includes “full- and part-time employees, including salaried officers and executives of corporations who are on the payroll in the pay period including March 12. Included are employees on paid sick leave, holidays, and vacations; not included are proprietors and partners of unincorporated businesses.”
- An establishment is defined as “a single physical location at which business is conducted or services or industrial operations are performed. It is not necessarily identical with a company or enterprise, which may consist of one or more establishments. When two or more activities are carried on at a single location under a single ownership, all activities generally are grouped together as a single establishment. The entire establishment is classified on the basis of its major activity and all data are included in that classification.”

CBP categorizes activity within each county by sector, with sectors based on the North American Industrial Classification System (NAICS). The NAICS classification scheme is hierarchical. For instance, sector 11 (Agriculture, Forestry, Fishing and Hunting) includes subsectors such as 111 (Crop Production), 112 (Animal Production), 113 (Forestry and Logging), 114 (Fishing, Hunting and Trapping) and 115 (Support Activities for Agriculture and Forestry). Each three-digit code is further subdivided into four- and five-digit codes that define each subsector at greater levels of specificity.³

Data are sometimes suppressed in CBP tables, for example, “to avoid releasing data that did not meet publication standards” or “to avoid disclosing data of individual companies.” In the Regional Profile, two-digit NAICS sectors are used to characterize county business activity, as the likelihood of data suppression increases at finer levels of classification.

Nonemployer Statistics

While County Business Patterns focuses on businesses with paid employees, the Nonemployer Statistics data series provides information (i.e., total establishments, total annual receipts) on businesses without paid employees.⁴ As with CBP, this information is available by county and NAICS sector.

According to the U.S. Census:

- “A nonemployer business is one that has no paid employees, has annual business receipts of \$1,000 or more (\$1 or more in the construction industries), and is subject to federal income taxes. Most nonemployers are self-employed individuals operating very small unincorporated businesses, which may or may not be the owner’s principal source of income.”
- “. . . for nonemployers we count each distinct business income tax return filed by a nonemployer business as a firm. A nonemployer business may operate from its owner’s home address or from a separate physical location. Most geography codes are derived from the business owner’s mailing address, which may not be the same as the physical location of the business.”
- “The composition of nonemployer receipts may differ from receipts data published for employer establishments. For example, for wholesale agents and brokers without payroll (nonemployers), the receipts item contains commissions received or earnings. In contrast, for wholesale agents and brokers with payroll (employers), the sales and receipts item published in the Economic Census represents the value of the goods involved in the transactions.”

Field Data Collection

We collected field data through interviews, small group meetings, observation and related activities conducted between Fall 2007 and Spring 2009.⁵ All field activities were directed toward understanding the history of local fisheries and the fishing community, current status and trends, infrastructure needed, provided and used. We used an iterative process using archival data analysis to inform fieldwork, and fieldwork to inform further archival data analysis, to build an integrated and historically grounded understanding of the North Coast fishing ports studied.

Altogether, we engaged more than 180 people through interviews and/or group meetings at the four study ports, including 73 fishermen, 24 seafood business owners and staff, 31 fishery-support business operators, 12 harbor managers and staff, and a number of other individuals.

We conducted semi-structured interviews with individual fishermen, fish receivers, processors, fishery-support business operators, harbor managers and staff and other knowledgeable individuals in each port. We sought broad coverage within and across these groups, and

used a modified snowball sampling technique to identify potential interviewees. Interviews ranged in length from 30 minutes to two hours, and addressed several topics including: involvement in fisheries, key business/operation characteristics, linkages within and among fisheries, and infrastructure and its use, and key factors and events that have affected local fisheries and the community over time. We conducted small group meetings with groups of fishermen (e.g., trawlers, charter operators, trollers) to collect summary information about characteristics of and use patterns in those fisheries, infrastructure needs and uses, and key factors and events that have affected local fisheries and the community over time.

In addition, we observed fish receiving and processing and support activities to develop a practical sense of the social and economic organization of local fisheries and the fishing community. We analyzed all field data (fieldnotes, documents, and other materials collected) and archival materials (e.g., harbor reports, newspaper articles, fishery bulletins) for content specific to the historic and present-day operations and circumstances of local fisheries and the fishing community.

ENDNOTES

- ¹ <http://pacfin.psmfc.org/>.
- ² <http://www.census.gov/econ/cbp/definitions.htm>.
- ³ See <http://www.census.gov/eos/www/naics/> for a complete description of NAICS codes.
- ⁴ <http://www.census.gov/econ/nonemployer/definitions.htm>.
- ⁵ Additional data were collected during the review process, in which study participants from each community had the opportunity to review the draft profile(s) to which they had contributed.

APPENDIX D: PROJECT TEAM BIOGRAPHIES

Caroline Pomeroy holds a MA in Marine Policy from the University of Miami and a PhD in the Human Dimensions of Fisheries from Texas A&M University. As a Research Scientist with the University of California Santa Cruz Institute of Marine Sciences (1995–2005) and a Marine Advisor with the California Sea Grant Extension Program (SGEP; 2005–present), she conducts social science research, education and outreach, to document and improve understanding of the human systems associated with California’s fisheries and fishing communities, and facilitate its application. Her work has included research on the socioeconomic organization of California’s squid and wetfish fisheries, the Moss Landing and Santa Cruz Harbor commercial fishing communities, the socioeconomic impacts of marine reserves on fisheries, and the effects of regulatory change on ports and port infrastructure. In addition, she serves on local, state and regional advisory committees including the Voices of the Bay Advisory Board and the California Dungeness Crab Task Force.

Melissa Stevens, a Project Specialist with the California Sea Grant Extension Program and a Research Associate with NMFS, holds a MS in marine science from Moss Landing Marine Laboratories. Her diverse background includes marine and freshwater biological research, as well as project development, facilitation, and implementation. Over the last several years, her interests in marine science evolved from the marine ecosystem to the human dimension of fisheries. Through her work in various jobs, she began to develop working relationships with members of the local fishing community. From 2005 through 2006, she was Program Manager for the Voices of the Bay, a collaborative fisheries education project that brought fishermen, scientists and teachers together to educate Monterey Bay area grade school students about local fisheries and fishing communities. More recently, she has conducted research on the human dimensions of California fisheries through the use of oral histories and as a project specialist with the Fishing Communities Project.

Cynthia Thomson has an MA in Economics from the University of California, San Diego. She has worked for NMFS, Southwest Fisheries Science Center for almost 30 years, the last 14 years as Economics Team Leader in Santa Cruz. The major focus of her work is market and nonmarket survey methods and research relevant to fishery management, ecosystem management, and salmon habitat restoration and recovery planning. She is a longtime member (and former chair) of the Pacific Fishery Management Council’s Scientific and Statistical Committee and co-chair of an inter-agency Economics Subteam that is evaluating potential economic effects of Klamath Dam removal. She is also an active member of the Pacific Recreational Fisheries Information Network (RecFIN) Technical Committee and the Marine Recreational Information Program Operations Team, and has served on various other scientific advisory committees (e.g., coastal pelagic species, market squid, white seabass).