

**Table 4-4 Important Use Areas and Range of Trinidad-Based Commercial Fishing Fleets**

| Principal Fishery  | Vessel Category  | Important Use Area and Range                                       |
|--------------------|------------------|--|
| Dungeness Crab     | Small and Medium | Locally to 30 nm north and 15 nm south in state and federal waters |
| Nearshore Rockfish | Small            | Locally to 15 nm north, primarily in state waters                  |

As described in Chapter Three, apart from the infrastructure and services available at Trinidad Rancheria pier, relatively few support services are available for resident and non-resident commercial fishermen and anglers. A variety of local businesses accommodate visiting anglers. These include a tackle shop and numerous campgrounds, restaurants, and lodging facilities, among others. But fishery participants typically order specialized goods by phone or online, and/or travel to Eureka to purchase specialized goods and services

**Table 4-5 Important Components of the Marine Fisheries Support Sector: Trinidad**

| Service or Product                      | Number   | Description  |
|---|----------|--|
| Boat yard                               | 0        | --   |
| Gear supplier                           | 0        | --   |
| Welding shop                            | 0        | --   |
| Marine electronics sales/service        | 0        | --   |
| Marine engine repair                    | 0        | --   |
| Marine fabricator/machine shop          | 0        | --   |
| Vessel maintenance/repair and/or sales  | 0        | --   |
| Refrigeration specialist                | 0        | --   |
| Airport                                 | 1        | Located in McKinleyville; 10-minute drive to Trinidad  |
| Charter fishing services                | 6        | Fishing guides and offshore charter fishing services   |
| RV parks/campgrounds                    | Numerous | Often accommodates visiting anglers  |
| Restaurants/hotels/motels               | Numerous | Often accommodate visiting anglers   |
| Tackle shops/outfitters                 | 2        | --   |
| Seafood processors                      | 1        | Small local operation  |
| Seafood buyers/distributors             | 5        | One large wholesaler, two retailers, two small buyers/distributors   |
| Harbors/marinas                         | 1        | Sheltered access ramp and popular pier inside the cove   |
| Commercial Fishing Trips (5 yr. avg.) * | 1,049    | Principal commercial fisheries   |
| Miscellaneous                           | --       | Fishermen often purchase goods & services from Trinidad- and Eureka-area businesses that are not dedicated solely to fisheries support |

\*From Pomeroy et al. (2010)

Mooring, ocean access, and offloading opportunities at Trinidad Pier are particularly important to the local commercial fishing fleet. Conversely, use fees support maintenance of the associated facilities. The tourist sector is also dependent on recreational fishing activity. For instance, at least nine vacation rental units are typically used by recreational fishermen during the course of a given season, and a variety of RV parks and campgrounds are also regularly used by visiting anglers. Numerous charter fishing services also serve visitors.

Trinidad is a small community, but its population swells with visitors in the summer months. Because Eureka is only 23 miles distant, residents typically acquire a wide variety of goods and services in that community. Although the rate of unemployment in Trinidad is relatively low, and relatively few persons are living in poverty, the PFMC & NMFS study (2006b) categorized

the community as most vulnerable to detrimental changes in the region’s marine fisheries. This finding derives from the fact that there is extensive local involvement in commercial and recreation fishing here, but with few economic alternatives should the industries falter.

**Table 4-6 Select Socioeconomic and Geographic Factors: Trinidad**

| <b>Factor</b>                                | <b>Description</b>   |
|--|--|
| Total Population                             | 311 persons (up to 2,000 in summer)  |
| Principal Forms of Economic Activity         | Government; Retail; Trade, Transportation, and Utilities; Commercial Fishing; Agriculture; Tourism |
| Rate of Unemployment*                        | 6.7 percent (vs. State of California: 13 percent)  |
| Median Family Income**                       | \$50,919 (vs. State of California: \$61,154)   |
| Person below Poverty Level                   | 9 percent (vs. State of California: 13 percent)  |
| Distance to Significant Population Centers   | Eureka: 23 m; Fort Bragg: 156 m; Crescent City: 62 m   |
| Level of Community Vulnerability/Resilience† | Most vulnerable: high level of dependence on commercial fishing; low level of resilience           |

Source: U. S. Census 2009; CDF&G 2007; Pomeroy et al. 2010; BEA 2009 \*EDD unemployment rates for February 2010; \*\* Incomes in 2008 inflation-adjusted dollars ; † cf. PFMC & NMFS (2006b)

**Shelter Cove Fleets, Fisheries, and Support Sector Businesses.** Fieldwork indicates that three full-time and two part-time commercial fishermen reside in the Shelter Cove area. The principal fisheries are: salmon troll; Dungeness pot; rockfish hook-and-line; urchin dive; and lingcod hook-and-line. Fewer than five local fishermen tend to participate in the commercial salmon fishery when it is open. No processors or distributors/buyers serve the local fleet.

As depicted in Table 4-7 below, most Shelter Cove-based fishing activity occurs in state jurisdiction waters within a relatively short distance from the cove itself (see Map 4-1).<sup>36</sup> When allowable, salmon fishermen will typically troll in state and federal waters between about six miles north and ten miles south of the cove. Most vessels stay within about five miles offshore, except when captains pursue albacore during certain years. Crabbers typically set their gear in the nearshore zone between and just south of Delgado Canyon and just north of Whale Gulch. Non-resident crabbers occasionally access the grounds around Shelter Cove, but often set their gear in relatively deep waters.

**Table 4-7 Important Use Areas and Range of Shelter Cove-Based Commercial Fishing Fleets**

| <b>Fishery</b>     | <b>Vessel Category</b> | <b>Important Use Areas and Range</b>                             |
|--------------------|------------------------|--|
| Dungeness Crab     | Small                  | Locally to 7 nm north to 5 nm south, primarily in state waters   |
| Nearshore Rockfish | Small                  | Locally to 5 nm north to 7 nm south, primarily in state waters   |
| Salmon             | Small                  | Locally to 9 nm north to 12 nm south in state and federal waters |

Shelter Cove is a small community located a considerable distance from any significant population center. Moreover, the rugged North Coast topography makes the trip to this area considerably more challenging than might be indicated by air distance alone. As such, the

<sup>36</sup> Data representing hook-and-line rockfish fishing around Shelter Cove cannot be reported given confidentiality concerns among less than three local fishermen.

community tends to attract residents and visitors who appreciate the beauty and solitude of the mountainous coastal surroundings.

Locally available fishery-specific goods and services are limited. As such, the numerous recreational anglers who frequent the area during good weather tend to come well-prepared to fish and run their fishing vessels. Similarly, local commercial fishermen tend to be well-adapted to the geographic isolation of Shelter Cove. When trips are made for acquisition of fishery-related goods and services, Eureka is the typical destination. Seafood, especially crab and rockfish, is typically sold locally but may also be shipped to distant locations.

**Table 4-8 Important Components of the Marine Fisheries Support Sector: Shelter Cove**

| Service or Product                     | Number   | Description   |
|--|----------|---|
| Boat yard                              | 0        | --  |
| Gear supplier                          | 2        | Located in Garberville (~45 minutes)                    |
| Welding shop                           | 0        | --  |
| Marine electronics sales/service       | 0        | --  |
| Marine engine repair                   | 0        | --  |
| Marine fabricator/machine shop         | 0        | --  |
| Vessel maintenance/repair and/or sales | 0        | --  |
| Refrigeration specialist               | 0        | --  |
| Airport                                | 1        | Small airstrip for light, privately owned planes        |
| RV park/campground                     | 1        | Often used by visiting recreational anglers             |
| Charter fishing service                | 1-3      | Attract numerous visiting anglers                       |
| Restaurants/hotel/motel                | Numerous | Seasonally at full capacity, quiet in winter            |
| Tackle shops/outfitters                | 1        | Light tackle is available at the local campground       |
| Processors/distributors/buyers         | 0        | Absence of buyers said to constrain commercial activity |
| Harbors/marinas                        | 1        | Small public access facility with breakwater            |
| Trips* (5-year average)                | --       | Data not available                                      |

\*From Pomeroy et al. 2010

The history of Shelter Cove recreational and commercial fisheries indicates continual expansion and contraction in response to changing levels of abundance of key species and evolving regulations. Thus, while certain fisheries have faltered over time, the social capital and basic interest required to maintain local fisheries have persisted despite limited fisheries-specific physical and service infrastructure. For instance, it should be noted that during the course of this study, the West Coast salmon fisheries re-opened after three years of dormancy. Shelter Cove business owners who had previously expressed great concern about the future are now cautiously optimistic about resumption of a launch service, two prospective charter fishing operations, and prospective opening of a new restaurant.

However, as noted in Table 4-9 below, the aforementioned PFMC & NMFS study (2006b) determined that Shelter Cove should be categorized as “most vulnerable” to detrimental changes in the region’s commercial fisheries. That is, the authors determined a high level of dependence on commercial fishing coupled with a low level of resilience (i.e., a local/regional lack of economic alternatives). Of note, median household income is significantly lower than that of households statewide, which may render particularly problematic any loss of jobs or income that follows from diminished commercial or recreational fishing activity.

**Table 4-9 Select Socioeconomic and Geographic Factors: Shelter Cove**

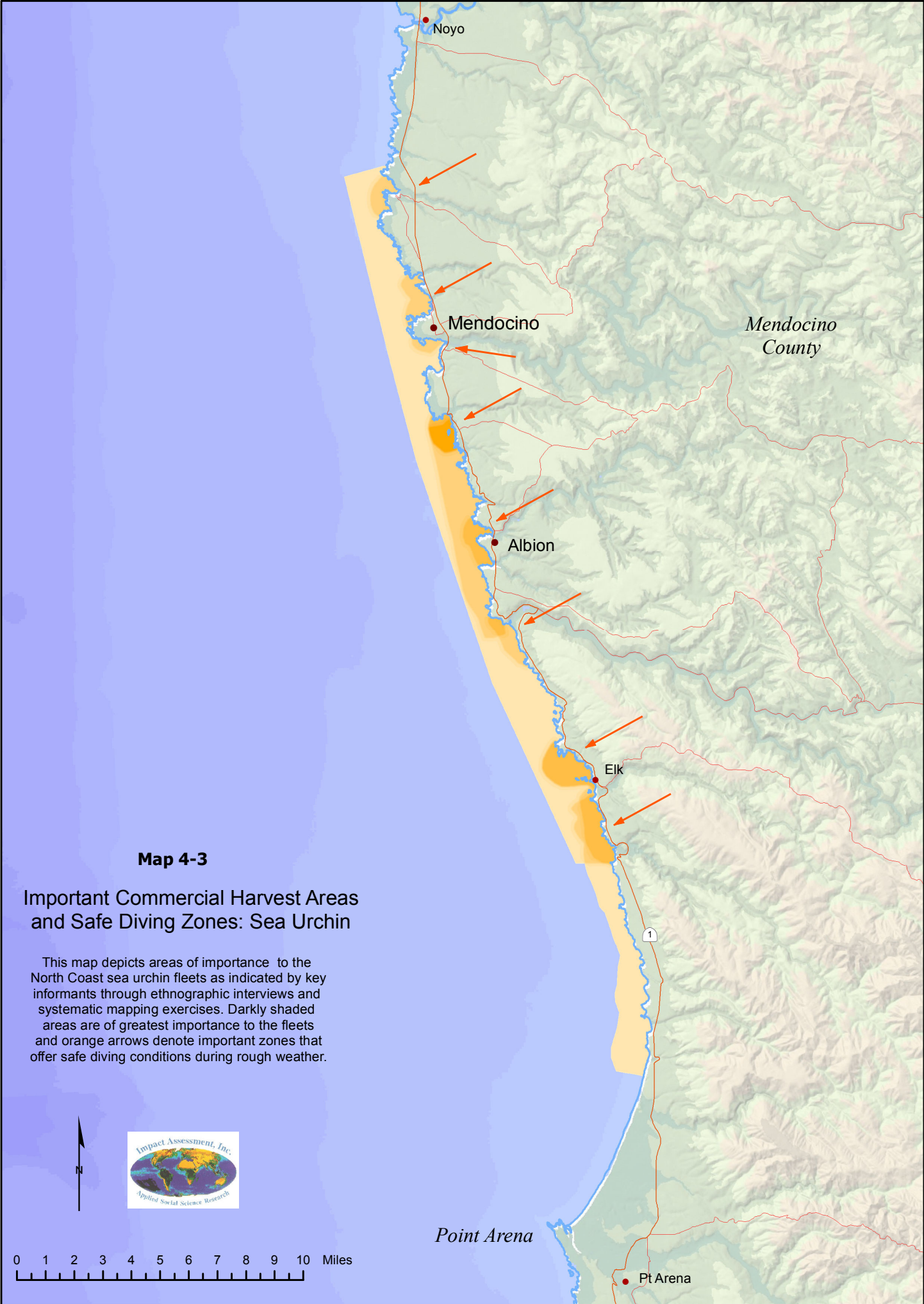
| <b>Factor</b>                                | <b>Description</b>   |
|--|--|
| Total Population                             | ~500 persons; population expands to around 2,000 in summer   |
| Principal Forms of Economic Activity         | Government; Education and Health Services; Trade, Trans., and Utilities; Retail; Commercial Fishing; Construction; Tourism |
| Rate of Unemployment*                        | --   |
| Median Family Income**                       | \$43,287 (vs. State of California: \$61,154)   |
| Persons below Poverty Level                  | --   |
| Distance to Significant Population Centers   | Eureka: ~60 m; Crescent City: 172 m; Fort Bragg: 91 m; Challenging road conditions make for long drive times               |
| Level of Community Vulnerability/Resilience† | Most Vulnerable: high level of dependence on commercial fishing; low level of resilience                                   |

Source: U. S. Census 2009; CDF&G 2007; Pomeroy et al. 2010; BEA 2009 \*EDD unemployment rates for February 2010; \*\* Incomes in 2008 inflation-adjusted dollars ; † cf. PFMC & NMFS (2006b)

***Fort Bragg/Noyo Harbor Fleets, Fisheries, and Support Sector Businesses.*** Fieldwork and review of archival data indicate that 60 to 80 licensed commercial fishermen live in the Fort Bragg/ Noyo Harbor area. The primary commercial fisheries conducted from Noyo Harbor are Dungeness crab pot; red sea urchin dive; groundfish trawl, hook-and-line, and trap; and salmon troll. Other fisheries of lesser or historic importance include the troll fishery for albacore tuna and the trawl fishery for ocean shrimp (Pomeroy et al. 2010b). Three processors and six buyers/distributors serve the local fleet.

The local commercial fleet is comprised of roughly seven trawlers, 30 to 40 salmon trollers, 15 to 20 multi-fishery vessels and about 10 to 15 urchin dive boats. As noted in the previous chapter, extensive public and private sector infrastructure is available to facilitate ocean access, vessel mooring, supply, maintenance, and other marine-related services. Local fishermen occasionally travel to Eureka (or San Francisco) to acquire specialized goods and services.

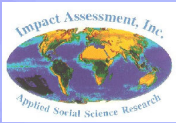
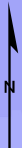
Table 4-10 below depicts the typical range and grounds of importance to locally based participants in the harvest sector. Most such fishermen here participate in multiple fisheries. Captains operating large and medium vessels in the Dungeness fishery typically in an area extending 100 miles north and 30 miles south of port, in both state and federal waters (see Map 4-1). However, some captains and crew may work as far south as Half Moon Bay and as far north as Bodega Bay for the opener, and begin moving toward local waters as the season progresses. Participants in the rockfish, salmon, and sea urchin fisheries typically travel anywhere from 25 to 35 miles north and 15 to 30 miles south to access productive nearshore and offshore zones (see Map 4-2, and Map 4-3 below). The Lost Coast region is renowned for halibut, lingcod, rockfish, tuna, and salmon fishing, though the majority of Noyo-based fishermen were not frequenting the area at the time of this study.



**Map 4-3**

**Important Commercial Harvest Areas and Safe Diving Zones: Sea Urchin**

This map depicts areas of importance to the North Coast sea urchin fleets as indicated by key informants through ethnographic interviews and systematic mapping exercises. Darkly shaded areas are of greatest importance to the fleets and orange arrows denote important zones that offer safe diving conditions during rough weather.



*Point Arena*

• Pt Arena

**Table 4-10 Important Use Areas and Range of Noyo-Based Commercial Fishing Fleets**

| <b>Fishery</b>     | <b>Vessel Category</b> | <b>Important Use Areas and Range</b>  |
|--------------------|------------------------|---|
| Dungeness Crab     | Large                  | Locally to 100 nm north to 30 nm south and outside the study region in state and federal waters                                     |
|                    | Medium                 | Locally to 55 nm north to 30 nm south in state and federal waters and occasionally outside study region in state and federal waters |
| Nearshore Rockfish | Small and Medium       | Locally to 35 nm north to 15 nm south, primarily in state waters  |
| Salmon             | Medium                 | Locally to 25 nm north to 30 nm south and outside the study region, primarily in state waters                                       |
| Sea Urchin         | Small and Medium       | Locally to 16 nm north to 21 nm south, primarily in state waters  |

As depicted in Table 4-11 below, a variety of fisheries-related goods and services are available in the Fort Bragg area. Of note, a Eureka-based business owner ships marine supplies to various Fort Bragg retail businesses on a weekly basis.

Although many North Coast fishermen are capable of various forms of repair work, Noyo-based fishermen included, local businesses are available for basic hull and engine repair and maintenance, welding services, electrical work, and so forth. It is often the case, however, that major refitting work on local vessels is undertaken in Eureka or in Coos Bay, Oregon.

The large vessel yard in Fort Bragg specializes in maintenance and repair of vessels involved in fisheries from Northern California to Alaska. The local small-boat yard provides space and support to fishermen who wish to work on engines and vessels themselves. This is a common situation since many fishermen in the region have been working on and around the ocean since early adulthood and have developed intimate familiarity with fishing vessels and vessel repair, among many other skills.

With regard to goods and services available to the recreational fleet, two local businesses service inboard engines; one undertakes fiberglass work. Three businesses specialize in marine goods, including bait and tackle. Three shops specialize in diving equipment; two of which also provide wetsuit rentals. Recreational fishing supplies can also be purchased at non-specialized outlets. Anglers report using catalogs and internet services to purchase some fishing and boating products. One Fort Bragg seafood buyer also owns and operates a dive shop and a fueling dock.

**Table 4-11 Important Components of the Marine Fisheries Support Sector: Fort Bragg/Noyo Harbor**

| Service or Product               | Number   | Description   |
|----------------------------------|----------|---|
| Boat yard                        | 3        | Numerous services provided. One yard caters to wooden vessels, one to large steel vessels, one to small vessels |
| Marine supplies                  | 10       | Numerous options for marine-related products  |
| Welding shop                     | 2        | --  |
| Marine electronics sales/service | 3+       | --  |
| Marine engine repair             | 3+       | --  |
| Hull repair                      | 2+       | --  |
| Marine fabricator/machine shop   | 1+       | --  |
| Commercial dive shop             | 2+       | --  |
| Marine refrigeration specialist  | 2        | --  |
| Airport                          | 1        | Privately owned   |
| Charter service                  | 5+       | Active charter fleet  |
| RV parks/campgrounds             | 8        | Extensive seasonal use  |
| Restaurant/hotel/motel           | Numerous | --  |
| Tackle shops/outfitters          | Several  | --  |
| Seafood processors               | 2        | Critical component of commercial service infrastructure   |
| Seafood buyers/distributors      | 6        | Critical component of commercial service infrastructure   |
| Harbors/marinas                  | 2        | Serving commercial and recreational fleets  |
| Trips* (5-year average)          | 3,097    | Highly active commercial fleets   |
| Miscellaneous                    | Numerous | Lumber, hardware, plumbing, auto supplies, paints, plastics, and industrial products                            |

As noted in Table 4-12 below, socioeconomic conditions in Fort Bragg are similar to other North Coast communities. That is, median family income is significantly lower than the statewide average, and a high percentage of residents are living in conditions of poverty. At nearly 14 percent, the local rate of unemployment is also quite high. The PFMF & NMFS study (2006b) classified the community as most vulnerable to detrimental changes in the region's fisheries.

**Table 4-12 Select Socioeconomic and Geographic Factors: Fort Bragg/Noyo Harbor**

| Factor  | Description  |
|---|--|
| Total Population                              | 7,026 persons  |
| Principal Forms of Economic Activity          | Government; Education and Health Services; Trade, Trans., and Utilities; Retail; Commercial Fishing; Construction; Tourism |
| Rate of Unemployment*                         | 13.9 percent (vs. State of California: 12.8 percent)   |
| Median Family Income**                        | \$36,548 (vs. State of California: \$61,154)   |
| Person below Poverty Level                    | 20.4 percent of population (vs. State of California: 13 percent )  |
| Distance to Significant Population Centers    | Eureka: 133 m; Crescent City: 218 m  |
| Level of Community Vulnerability/Resilience * | Most Vulnerable: high level of dependence on commercial fishing; low level of resilience                                   |

Source: U. S. Census 2009; CDF&G 2007; Pomeroy et al. 2010; BEA 2009 \*EDD unemployment rates for February 2010; \*\* Incomes in 2008 inflation-adjusted dollars ; † cf. PFMF & NMFS (2006b)

***Albion Fleets, Fisheries, and Support Sector Businesses.*** The primary commercial fisheries conducted from Albion are sea urchin dive; rockfish, cabezon, and greenling hook-and-line; and salmon troll. Red sea urchin is the principal commercial fishery at this small port. No processors are available to serve the local commercial fleet, but two buyers/distributors are located in the vicinity, and other buyers may serve the local fleet as landings and market conditions allow.

The local commercial fleet is comprised of about 23 vessels, including three salmon trollers, five nearshore hook-and-line vessels, eight urchin dive boats, and a variety of mixed-use vessels. Given recent closures, local salmon fishermen are increasingly exerting effort in the region’s urchin, crab, and herring roe-on-kelp fisheries.

Table 4-13 depicts the typical range and grounds of importance to local commercial fishermen. Most Albion area fishermen harvest nearshore species in state waters, and tend to venture not much more than about 15 miles north or south of the harbor (see Maps 4-1 through 4-3). Vessels are typically in the 18- to 24-foot range. A few captains pursue salmon in federal jurisdiction waters. There is close affiliation between fishermen and other residents of Albion with Fort Bragg, which is some 17 miles distant.

**Table 4-13 Important Use Areas and Range of Albion-Based Commercial Fishing Fleets**

| <b>Fishery</b>     | <b>Vessel Category</b> | <b>Important Use Area and Range</b>                               |
|--------------------|------------------------|---|
| Sea Urchin         | Small                  | Locally to 10 nm north and 10 nm south, primarily in state waters |
| Nearshore Rockfish | Small                  | Locally to 15 nm north and 15 nm south, primarily in state waters |
| Salmon             | Small                  | Locally to 8 nm north and 15 nm south in state and federal waters |

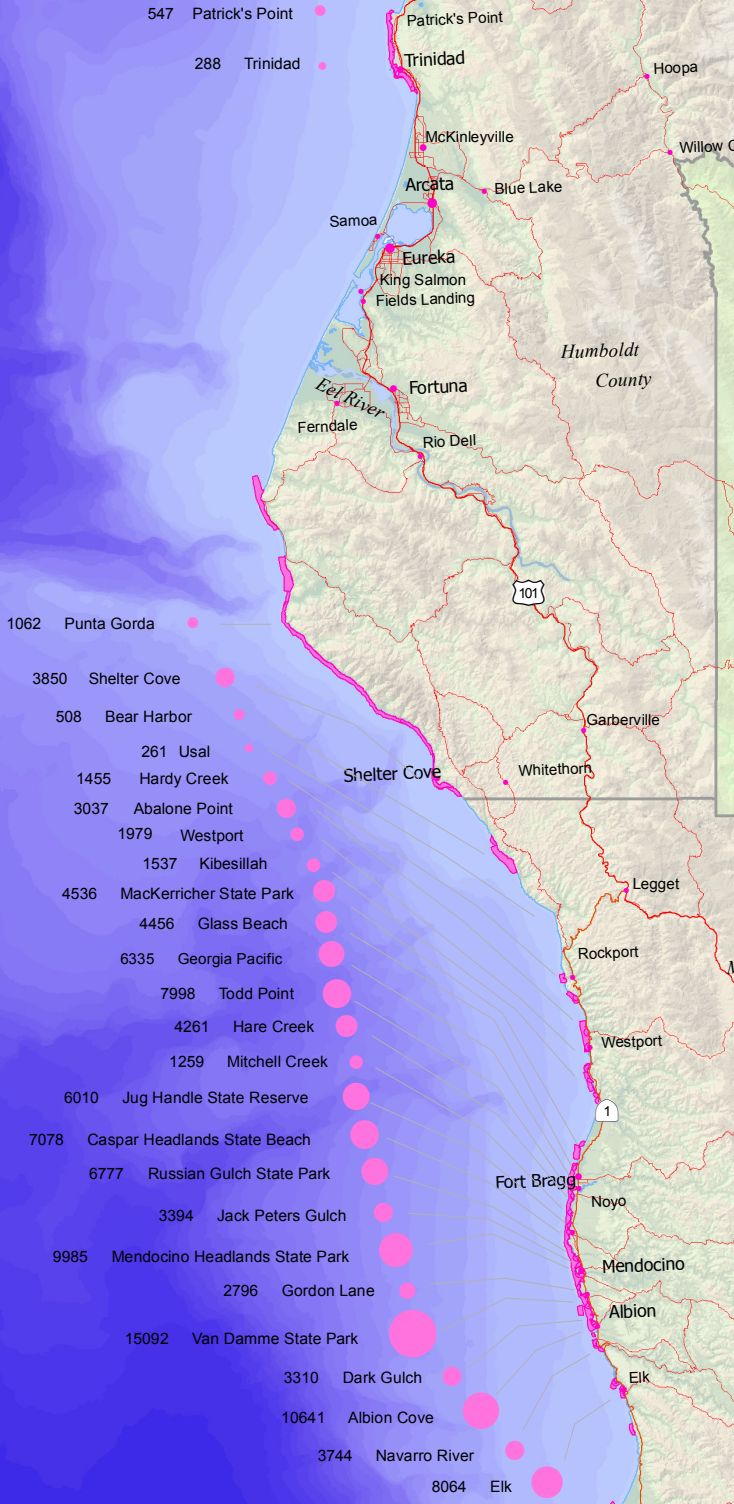
The commercial fishery support sector is somewhat limited in Albion. There are commercial and recreational docking facilities, launch ramps for small vessels, and vessel storage space. Most fishermen travel to Fort Bragg, for specialized marine services. Limited services are also available in Mendocino and Ukiah.

Owners of local campgrounds, hotels, and restaurants report operating at full capacity during the summer months, largely due to visiting abalone divers and recreational anglers (see Map 4-4). Such activity tends to start in April and decline in November, with peak season during the summer months. Rental property owners advertise the proximity of Albion to recreational abalone grounds, and campground owners advertise the facilities and services they provide for recreational fishing and diving enthusiasts. Owners and operators of local restaurants and grocery stores report benefiting from seasonal population growth associated with recreational fishing and diving.



### Important Recreational Use Areas Abalone (Dive and Shore Collection)

This map depicts areas of importance to North Coast recreational abalone harvesters as indicated by key informants through ethnographic interviews and systematic mapping exercises and from abalone report cards. Shaded areas are of importance to users. Figures represent six year averages (2002-2007) by report site, as provided by California Department of Fish and Game.

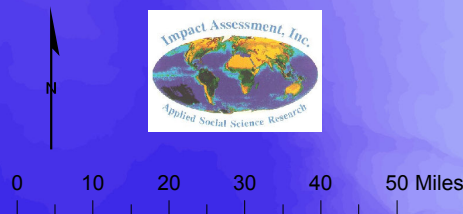


20 Fathom  
RCA line

### Map 4-4

### Important Recreational Use Areas Rockfish (Boat Angling)

This map depicts areas of importance to North Coast recreational rockfish harvesters as indicated by key informants through ethnographic interviews and systematic mapping exercises. Darkly shaded areas are of greatest importance to users. Areas of effort outside of the 20 fathom RCA lines denote either past areas of importance or elevated pinnacles where fishing is permitted.



**Table 4-14 Important Components of the Marine Fisheries Support Sector: Albion**

| Service or Product                      | Number   | Description   |
|---|----------|---|
| Boat yard                               | 0        | --  |
| Ship's store/gear supplier              | 0        | --  |
| Welding shop                            | 0        | --  |
| Marine electronics sales/service        | 0        | --  |
| Marine engine repair                    | 0        | --  |
| Marine fabricator/machine shop          | 0        | --  |
| Commercial dive shop                    | 0        | --  |
| Marine refrigeration specialist         | 0        | --  |
| Airport                                 | 1        | Located 2 miles away at Little River; public  |
| Charter service                         | 0        | --  |
| RV parks/campgrounds                    | 2        | Tend to serve recreational anglers on seasonal basis  |
| Restaurant/hotel/motel/vacation rentals | Numerous | Extensive seasonal business from recreational anglers   |
| Tackle shops/outfitters                 | 0        | --  |
| Distributors and processors/buyers      | 2        | Non-resident buyers may also come to Albion on occasion   |
| Harbors/marinas                         | 2        | Small facilities for commercial and recreational vessels  |
| Trips (5-year average)                  | --       | Data not available  |
| Miscellaneous                           | Numerous | Fishermen often purchase goods & services from area businesses that are not dedicated solely to fisheries support |

As depicted in Table 4-15, Census data for Albion indicate a relatively low rate of unemployment and a relatively small percentage of persons living in poverty. Median household incomes are considerably lower than for the state as a whole, however, and the 2006 study conducted by PFMC and NMFS (PFMC & NMFS 2006b) determined that a high level of local dependence on fishing and few economic alternatives in the region rendered the community most vulnerable to detrimental changes in the region's fisheries.

**Table 4-15 Select Socioeconomic and Geographic Factors: Albion**

| Factor                                       | Description  |
|--|--|
| Total Population                             | 1,035  |
| Principal Forms of Economic Activity         | Education and Health Services; Tourism; Agriculture, Forestry, Fishing, and Hunting      |
| Rate of Unemployment*                        | 4.3 percent (vs. State of California: 13 percent)  |
| Median Family Income**                       | \$40,491 (vs. State of California: \$61,154)   |
| Person below Poverty Level                   | 9.8 percent (vs. State of California: 13 percent)  |
| Distance to Significant Population Centers   | Eureka: 150 m; Crescent City: 235 m; Fort Bragg: 17 m                                    |
| Level of Community Vulnerability/Resilience† | Most Vulnerable: high level of dependence on commercial fishing; low level of resilience |

Source: U. S. Census 2009; CDF&G 2007; Pomeroy et al. 2010; BEA 2009 \*EDD unemployment rates for February 2010; \*\* Incomes in 2008 inflation-adjusted dollars ; † cf. PFMC & NMFS (2006b)

***Crescent City Fleets, Fisheries, and Support Sector Businesses.*** Fieldwork and review of archival data indicate that about 120 commercial fishermen are active in the Crescent City area. The principal commercial fisheries conducted from Crescent City are: Dungeness crab pot fishery; groundfish trawl; hook-and-line and trap; pink shrimp trawl; Pacific whiting trawl; and troll fisheries for salmon and albacore (Pomeroy et al. 2010). The resident fleet includes: five trawlers, 12 nearshore hook and line vessels, and about 100 crab/troll vessels. Most area fishermen are involved in multiple fisheries.

Table 4-16 depicts the typical range and grounds of importance to local commercial fleets. Captains of large crab vessel often travel as far as 50 miles south and 20 miles north in state and federal waters. Captains of small- and medium-sized vessels tend to stay within 10 to 12 miles north or south of the harbor, primarily in state waters. Participants target nearshore species including rockfish, sea urchin, shrimp, and abalone (Maps 4-1 through 4-3, and Map 4-5 below).

**Table 4-16 Important Use Areas and Range of Crescent City-Based Commercial Fishing Fleets**

| <b>Fishery</b>     | <b>Vessel Category</b> | <b>Important Use Area and Range</b>  |
|--------------------|------------------------|--|
| Dungeness Crab     | Large                  | Locally to 20 nautical miles (nm) north to 50 nm south of harbor and outside of study region in state and federal waters |
|                    | Small and Medium       | Locally to 10 nm north-northwest to 12 nm south, primarily in state waters   |
| Nearshore Rockfish | Small                  | Locally to 8 nm miles north-northwest to 12 nm south, primarily in state waters  |
| Coonstripe Shrimp  | Small and Medium       | Locally to 3 nm west to 8 nm south, primarily in state waters  |

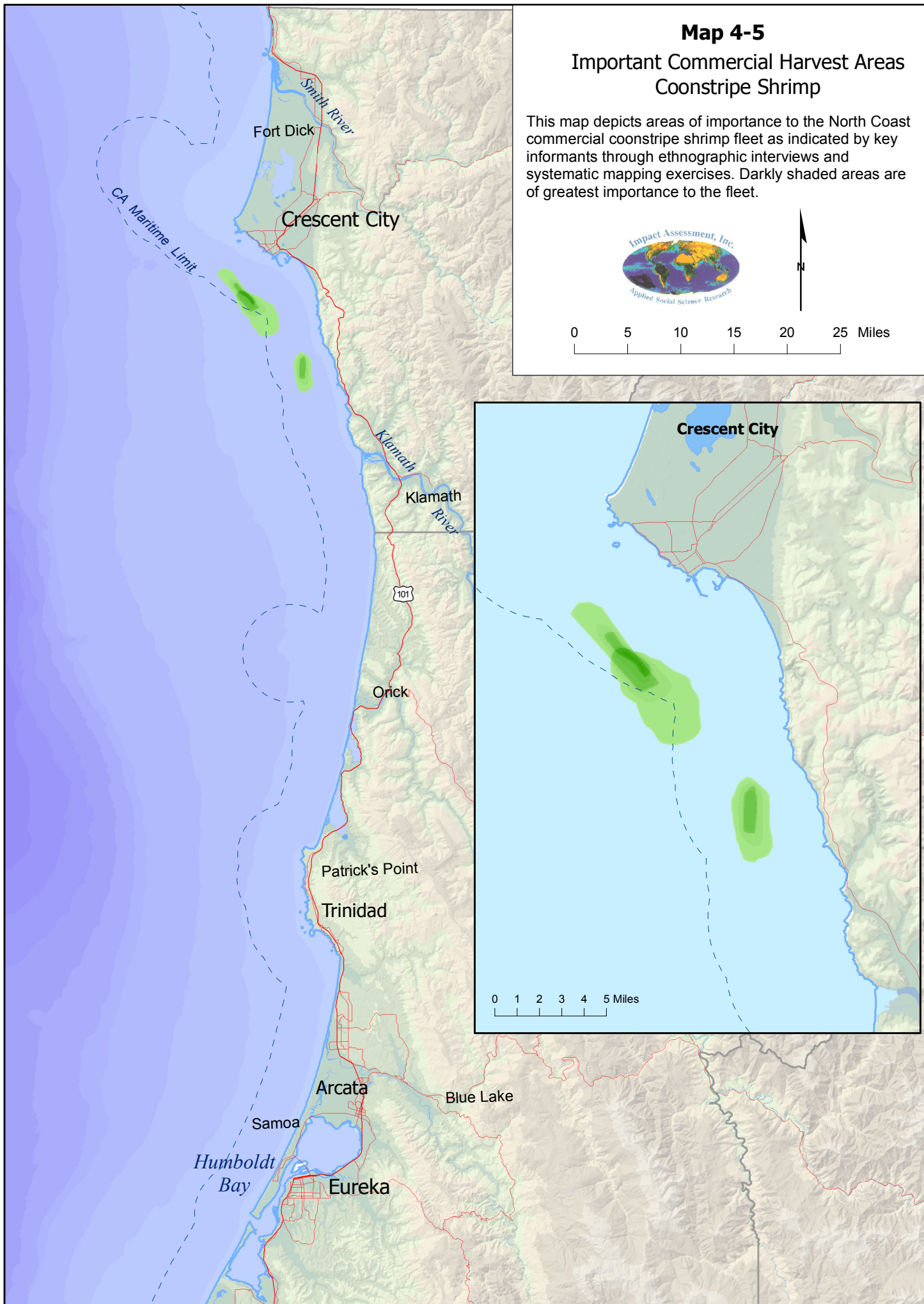
Crescent City-based commercial fleets have tended to be both active and productive over the years, requiring an extensive support sector. Of particular importance today are the local processor and the six buyers who serve the fleet (Pomeroy et al. 2010). Some of the buyers say that it can be difficult to meet market demand because of: increasing overhead costs, limited economies of scale,<sup>37</sup> regulatory constraints on the fleets, and attrition of certain commercial fleets due to the aging out of captains and lack of replacement with younger fishermen. Of note, the 2009 salmon season which limited recreational fishing to the KMZ reportedly was profitable for many businesses in Crescent City.

A number of local captains of small- to medium-sized vessels are now selling high-value coonstripe shrimp to two specialized buyers who, in turn, distribute to markets in the San Francisco Bay area. A small contingent of local fishermen sells albacore, shrimp, and rockfish directly to retailers, restaurants, and consumers in the Crescent City area.

Some service sector business owners report challenges associated with competition from Oregon business owners who pay lower worker’s compensation rates and who attract business from local fishermen who pay no sales tax in Oregon. But many small-vessel operators interviewed in Crescent City tended to express satisfaction with the local availability of fisheries goods and services. Some large-vessel captains report that certain mechanical and machine services can be difficult to acquire locally, and that reasonably priced boat yard facilities could improve the efficiency of their operations. Currently, there is some reliance on such services as available at publically funded yards in Eureka and Alaska.

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<sup>37</sup> Certain factors cause a buyer’s overhead costs to fall as the scale of output is increased. But in a relatively small and competitive local market, expansion can be hard to obtain.



Public funds have recently become available for improvements to marine infrastructure in Crescent City. A total of \$4.2 million in federal funds has been allocated for dredging, and \$685,000 has been acquired through the California Coastal Conservancy to develop a new master plan for the harbor. Costs for repairs required after the 2010 tsunami were addressed by the California Emergency Management Agency.

At least four local businesses support recreational fishing in the Crescent City area. Recreational fishing supplies can also be purchased at non-specialized outlets. Respondents noted that small motorized boats and high quality kayaks were not currently available in the area.

**Table 4-17 Important Components of the Marine Fisheries Support Sector: Crescent City**

| Service or Product                     | Number   | Description  |
|--|----------|--|
| Boat yard                              | 1        | Conversions, Repair, New Construction, Fishing Boats, and Work Boats                 |
| Ship's store/gear supplier             | 1        | Provides for a variety of fishing gear and vessel needs                              |
| Welding shop                           | 1        | --   |
| Marine electronics sales/service       | 1        | Basic VHF, fish finders, GPS, etc.   |
| Engine and equipment repair            | 2        | Basic maintenance and repair   |
| Marine fabricator/machine shop         | 1        | --   |
| Vessel maintenance/repair and/or sales | 9        | Seven commercial; two recreational   |
| Marine refrigeration specialist        | 1        | Critical for commercial fleet  |
| Airport                                | 1        | Jack McNamara Field; Public  |
| Dive equipment sales/lessons           | 1        | Often accommodate abalone divers   |
| Charter fishing service                | 2        | Variety of trips and species   |
| RV parks/campgrounds                   | 2        | Often accommodate recreational anglers   |
| Restaurants/hotel/motel                | 7        | Numerous restaurants; seven hotels/motels  |
| Tackle shops/outfitters                | Numerous | Basic tackle needs, bait, etc.   |
| Distributors and processors/buyers     | 7        | One buyer/processor; six buyers  |
| Harbors/marinas                        | 1        | Large, highly active public harbor   |
| Trips* (5-year average)                | 3,044    | Very active local fleets   |
| Miscellaneous                          | Numerous | Lumber, hardware, plumbing, auto supplies, paints, plastics, and industrial products |

As depicted in Table 4-18 below, the rate of unemployment percentage of persons living in poverty are quite high in the Crescent City area. Moreover, median incomes are well below half the statewide average. The 2006 study conducted by PFMC and NMFS (PFMC & NMFS 2006b) determined that a high level of local dependence on fishing and few economic alternatives in the region rendered the community vulnerable to any detrimental changes in the region's fisheries. Fishery-related business owners in Crescent City relate their own economic challenges to a lack of capital and disposable income among residents who might otherwise invest in their vessels and gear, a situation they see as compounded by the recent national economic crisis. Some small business owners in Crescent City report losing customers to Oregon, where they do not have to pay sales tax.

**Table 4-18 Select Socioeconomic and Geographic Factors: Crescent City**

| <b>Factor</b>                                | <b>Description</b>   |
|--|--|
| Total Population                             | 4,006  |
| Principal Forms of Economic Activity         | Government; Retail; Trade, Transportation, and Utilities; Commercial Fishing; Agriculture; Tourism |
| Rate of Unemployment*                        | 17.1 percent (vs. State of California: 13 percent)   |
| Median Family Income**                       | \$25,783 (vs. State of California: \$61,154)   |
| Person below Poverty Level                   | 34.6 percent (vs. State of California: 13 percent)   |
| Distance to Significant Population Centers   | Eureka: 84 m; Fort Bragg: 218 m  |
| Level of Community Vulnerability/Resilience† | Vulnerable: high level of dependence on commercial fishing; low level of resilience                |

Source: U. S. Census 2009; CDF&G 2007; Pomeroy et al. 2010; BEA 2009 \*EDD unemployment rates for February 2010; \*\* Incomes in 2008 inflation-adjusted dollars ; † cf. PFMC & NMFS (2006b)

### 4.3 Synthesis of Key Processes and Issues

***Patterns of Seafood Distribution.*** Transfer of seafood - from the ocean to the fisherman to the end consumer - frequently involves many intermediate buyers and sellers; extensive processing and packaging work; and extensive chilled transportation via fishing vessels, trucks, container vessels, small airplanes, jets, and so forth. Each step in the distribution process adds cost to the consumer and generates revenue for the community of persons involved in the fishery in question. In many cases locally landed seafood is eventually transferred to national and global markets, directing any further multiplying effects outside the originating port community. In other cases, the transfer is more simplistic, and some part of the catch almost invariably remains in the port community where it may be: sold to a buyer or processor; shared in family, extended family, neighborhood, fleet, and community settings; or consumed directly by the fisherman and family.

The purpose of documenting patterns of seafood distribution in the study region is to enable planners to anticipate the potential changes that might occur as a result of establishing any given MPA or array of MPAs in the region. From a systems perspective, seafood distribution can be envisioned in terms of the number of pathways or vectors available to a given fishing operation, and in terms of the importance of a particular vector or vectors to a certain business, group of businesses, and the fishing-oriented community as a whole. Closing areas of the ocean to commercial fishing activities has the potential to constrain, redistribute, or stop the flow of seafood and associated revenue through channels that were established based on historical productivity of certain fishing grounds, with potentially far-reaching economic and social consequences. Similarly, closing areas of the ocean to recreational fishing activities has the potential to alter the distribution and/or degree of purchase and use of local recreational fishing support goods and services. The situation calls for detailed attention to the social and economic interactions that enable functioning marine fisheries.

Channels of seafood distribution vary based on local infrastructure and service capacity, the species in question and associated storage and preservation requirements, and decisions made by the owner of the product at any given stage in the process. Understanding the sequence of linkages and requirements for distributing a perishable marine resource can be complicated since a single person or a multi-faceted business entity can undertake one or many roles in the process. For instance, one fisherman may deliver the catch directly to the public or to local retailers and

restaurants, while another may sell to a receiver or offloader who, in turn, may up the price and sell to processors or wholesalers. Some fishermen operate receiving stations used by other fishermen, often for a fee. It should be noted that some species are sold for bait used in both commercial and recreational fishing. Typical distribution roles include: fisherman/distributor; receiver/buyer; buyer/processor; processor/wholesaler; wholesaler/distributor, retailer. Such marketing options and seafood distribution pathways tend to vary across the study region. For instance, as depicted below, the straightforward situation at Shelter Cove is quite unlike that in Eureka, where multiple forms of distribution have been documented during the course of this study.<sup>38</sup>

### **Shelter Cove**

Fisherman →Direct Sale to Consumer

Fisherman →Retailer, Grocer, Restaurateur →Consumer

### **Eureka**

Fisherman →Direct Sale to Consumer

Fisherman →Retailer, Grocer, Restaurateur →Consumer

Fisherman →Processor →Wholesaler → Retailer, Grocer, Restaurateur →Consumer

Fisherman →Receiver →Wholesaler → Retailer, Grocer, Restaurateur →Consumer

Fisherman →Buyer/Processor→ Wholesaler→ Retailer, Grocer, Restaurateur →Consumer

***Diversification and Specialization in the Support Sector.*** North Coast processors, buyers, distributors, and marine goods and service providers typically discuss a variety of contemporary challenges. These include: the economic effects of closed and/or time-limited commercial and recreational salmon seasons; the rising costs of acquiring marketable goods from distant markets; the pervasive effects of the national and international economic crisis; a putative lack of skilled labor in the marine fabrication sector; strict OSHA and EPA rules regarding use and disposal of fiberglass, resins, and epoxies; and competition from out-of-state businesses. Some informants asserted that salmon disaster relief funds have helped stabilize the industry and the regional economy as a whole.

Some support sector businesses specialize in certain products and services, while others may be relatively more diversified. Some such businesses are small family-owned operations with a single facility, while others are corporation-owned businesses with multiple locations. Such variability should be a significant consideration for MLPA assessment and planning purposes, since diversification of services and locations can buffer the detrimental effects of area-specific fishing closures, and because businesses providing specialized goods or services and businesses located in a single location may potentially be particularly vulnerable to closure of adjacent fishing grounds.<sup>39</sup> It should be noted that loss of marketing options can significantly affect a given fleet or fishing community. For example, the shark fishery conducted in Humboldt Bay is no longer a viable fishery due to loss of local buyers.

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<sup>38</sup> See also Pomeroy et al. (2009a; 2009b; 2010a; and 2010b) for pathways of seafood distribution in the region.

<sup>39</sup> For instance, varying weather and sea conditions, changes in the distribution and abundance of the targeted species, and area-specific fishing regulations can prevent market demand from being met by fishermen in a single harbor. Thus, some buyer/processors benefit by maintaining receiving stations in multiple locations.

Key informants in the study region enumerated some 25 particularly important (nodal) businesses engaged in the purchase, processing, and distribution of seafood in the region. These and other commercial fisheries support sector businesses are depicted in Map 4-5 below. Although not of equal size or capacity, each buyer/processor/distributor was deemed an important vector for sale and distribution of seafood in, across, and outside the North Coast region. In terms of diversification of services/products and locations, these businesses were perceived to fall within a continuum between two extremes.

At one end of the continuum, five major North Coast receiver/buyer/processors are known to serve more than one North Coast port community and/or major ports outside of the study region. Each is involved in multiple state and federal water fisheries, and each distributes to other firms across the region, nation, and globe. At the other end of the continuum, one receiver/buyer/processor serves only one major North Coast port and only one fishery, which is caught solely in state waters. Within the continuum, three businesses serve one port for one species; two serve more than one major port and focus on high value live market products only; and numerous seafood businesses are fairly diversified in terms of fisheries, but operate only in a single community.

***Constraining and Enabling Factors, and Interaction between Commercial Sectors.*** A variety of factors currently render North Coast seafood processing and distribution firms vulnerable to changes in the harvest sector, and the harvest sector itself is subject to a variety of challenges and forces of change. Again, such factors are important in MLPA assessment and planning processes since the current status of a given fishery is in total always conditioned by historic and contemporary changes in: (a) the marine and regulatory environments; (b) technology associated with navigation, fish-finding, fishing, and seafood processing; (c) the marketplace; (d) the demography of participants in the harvest sector; (e) fixed and trip costs; and (f) processing and transportation costs, among other factors.












***Regulatory Factors.*** Participants in the various sectors of the North Coast commercial fishing industry repeatedly mention that the physical and service infrastructure associated with seafood processing and distribution has been significantly affected by a long series of regulatory changes. Most business owners discuss regulatory changes in the salmon, groundfish, albacore, and shrimp fisheries. In some cases, harvest sector regulations have led to the departure of buying and processing facilities from the region. Concerns have been raised about the future of the region's fisheries support sectors, largely in association with the potentially constraining effects of prospective new quotas and by-catch rules associated with an IFQ system for groundfish, and pot limits for the Dungeness fishery.

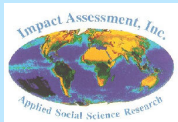
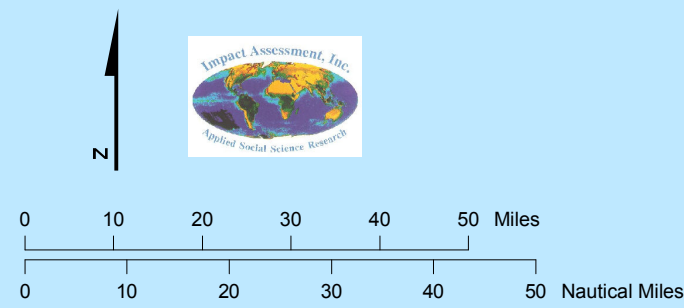


### Map 4-6

### Commercial Fishing Support Sector

This map depicts area businesses of importance to the North Coast commercial fishing fleets as indicated by key informants through ethnographic interviews. The category of vessel maintenance and repair includes businesses that provide essential goods and/or services related to electrical, navigational, hydraulic, engine, and refrigeration systems in addition to hull and rigging structures.

-  Marina/Pier/Boat Launch Facility
-  Fuel Dock
-  Receiver
-  Buyer
-  Buyer/Processor
-  Retailer
-  Ice Facility
-  Vessel Maintenance & Repair
-  Boat Yard
-  Gear, Bait & Dive Supplier
-  General Supplies



Crescent City

Del Norte County

Siskiyou County

Trinidad

Trinity County

Arcata

Shasta County

Eureka

Fortuna

Rio Dell

Humboldt County

Trinity County

Shelter Cove

Tehama County

Mendocino County

Fort Bragg

Glenn County

Mendocino

Albion

Philo

Ukiah

Lake County

Sonoma County

Yolo County

It should be noted that a large percentage of North Coast fishing grounds are, at some point during the year, closed to pursuit of certain species or to use of certain types of gear. Particularly important regulations affecting North Coast fleets and support sector businesses are depicted in Table 4-19 below. Because most closures involve a temporal aspect, both season and affected area are provided in the table.

**Table 4-19 Key Regulations Affecting Commercial Fishing Operations along the North Coast**

| Species/Gear Type  | (Open) Season   | Closed Areas  |
|--|---|---|
| Coonstripe Shrimp  | Open May 1st to October 31 <sup>st</sup>  | --  |
| Dungeness Crab   | Open December 1st to July 15th  | Crabs harvested from one mile radius of Eel River, Humboldt Bay, and Trinidad Bay may not be sold |
| Nearshore Rockfish Complex (hook-and-line) and Lingcod (limited entry and open access) | (Rockfish) Open May through February south of 40°10' ; open all year round north of 40°10' (Lingcod) Open May through November  | Closed 30-150 fathoms south of 40°10' and 20-100 fathoms north of 40°10'                          |
| Salmon   | Regulations regarding seasons depend upon the status of the resources and vary by area with KMZ generally being more restricted. The commercial season for the whole coast was closed in 2008 and 2009. |   |
| Sea Urchin   | Open seven days per week from November through May, and Monday through Thursday from June through October.  | Point Cabrillo State Marine Conservation Area   |

Regulations can tend to redistribute fishing effort and lead to a reordering of existing systems of fisheries-related social and economic interaction. For instance, key persons in the harvest sector report that spatially designated rockfish quotas have forced some fishermen to change harbors, and that salmon, nearshore rockfish, and trawling regulations have displaced fishing effort into various crab grounds, leading to interaction between fleets that were formerly not as likely to interact on the ocean. Notably, KMZ-specific salmon bag limits now encourage fishermen to offload on a daily basis, thereby restricting their range to within a day's voyage from port. Destination and range have also been affected by regulations that preclude delivery to a specific port if that port is located in a closed area. Further, because participation in the federal waters groundfish fisheries requires use of observers and/or vessel monitoring systems (VMS), some fishermen are opting to fish only in state waters when targeting rockfish and/or are participating only in federal water fisheries other than groundfish.

For fishermen who participate in both crab and the groundfish trawl fishery, decisions regarding where to fish are based largely on allowable/available quota and price per pound. Quota availability and prices permitting, the trawl fishery is often said to be relatively more stable and dependable than the crab fishery. This perspective is captured in the comment of a key fisherman in Eureka who said that when the [petrale sole] quota is good, it is like a "bird in the hand," whereas finding crab can be a "guessing game." However, the fisherman added that the future may hold challenges, believing that pending establishment of an Individual Fishing Quota (IFQ) system will make the crab fishery more competitive.

Commercial urchin divers and kelp harvesters in northern Mendocino County assert that there has been some displacement of effort arising from establishment of MPAs in southern portions

of the county and in Sonoma and Marin Counties. Displacement of effort is also said to be occurring amongst recreational abalone divers. The situation has given rise to concerns about possible overharvesting and may be instructive of the potential future ecosystem effects of MPAs along the North Coast and elsewhere in the larger region.

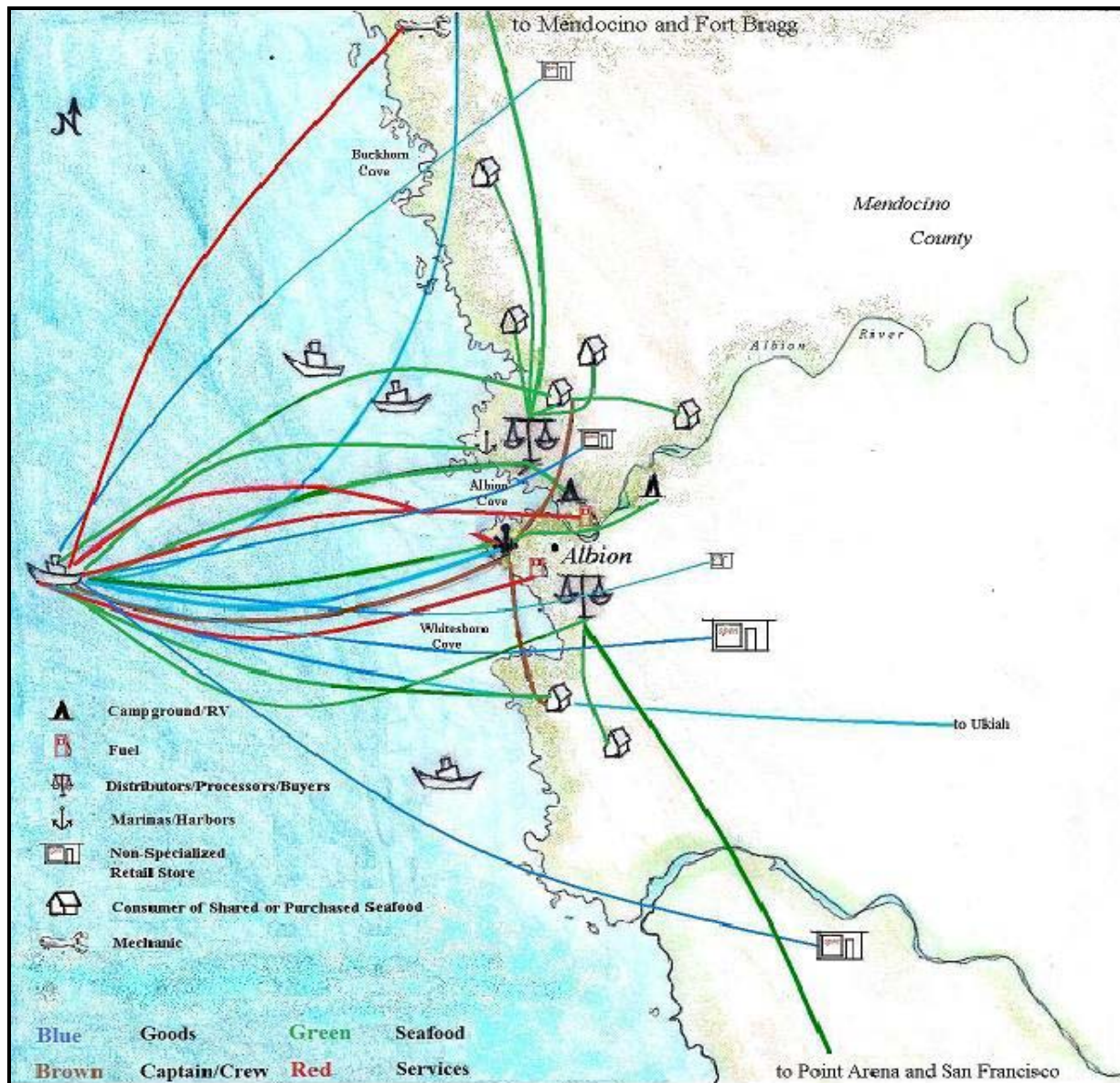
The sum effect of historic changes, especially regulatory changes, has been a significant level of attrition of commercial fishing fleets across the North Coast. Commercial fishermen frequently note that diminishing fleet size and hence diminishing levels of catch and effort have resulted in fewer buyers and processors in the region, and consolidation of many remaining businesses. Consolidation also occurs in part from pressures and challenges within the support sector itself. For instance, market challenges associated with an influx of seafood harvested outside the U.S., and increasing processor licensing fees, waterfront leasing costs, and shipping fees are but a few of the economic challenges confronting the processing and distribution sector. Some informants asserted that, as is the case in the harvest sector, numerous business owners and operators in the processing and distribution sectors were also aging out of the industry without replacement, thereby furthering loss of small seafood businesses in the region.

Consolidation tends to reduce the number of distribution vectors and options for participants in the harvest sector, thereby creating critical nodal relationships that are not always optimal for fishermen and that in some cases may render a given fishery vulnerable to further challenges. The prospective effects of MPA-related closures will need to be addressed with due consideration of this historic and contemporary context – especially since such effects may involve further constraints on the spatial distribution of effort and level of production in the harvest sector, and hence the viability of support sector businesses across the region.

*Numerous Social and Economic Linkages.* Part of the MPA assessment context is the backward and forward nature of linkages between the harvest, processing/distribution, and support sectors. That is, each sector is mutually dependent on the viability of the other, and by extension the status of the entire system can affect social and economic aspects of life in the host communities and region as a whole.

Commercial and recreational fishermen require many products and services. These vary depending on target species, gear and vessel requirements, and other factors. Because seafood is highly valued, fishermen also *provide* an important service. Socioeconomic relationships involving fisheries goods and services can be extensive and complex, even for a single fisherman in a small community.

The following illustration is intended to represent the basic extent of documented linkages between an Albion-based commercial fisherman and various support sector goods and service providers with whom he interacts in Albion and elsewhere along the North Coast. By multiplying linkages identified in this and more complex schematics across the Albion fleet it would be possible to begin to approximate the actual complexity and extent of fishery-specific linkages in this rural area. Identifying the key components, vectors, linkages, and relationships involved in nearshore North Coast fisheries is a central objective of this project, and a requisite for effective assessment of the full range of effects of the MLPA process along the North Coast.



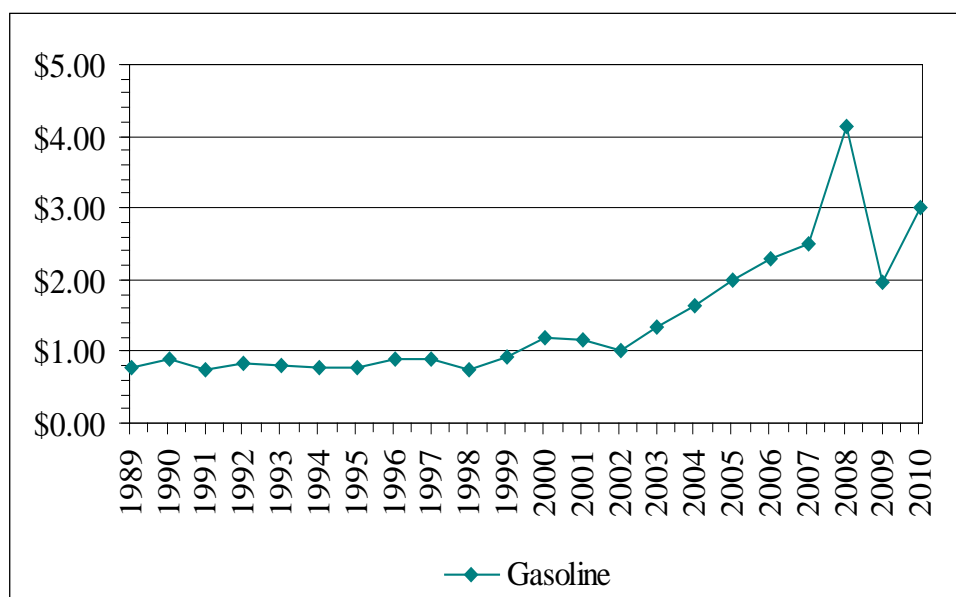
**Figure 4-1 Known Social and Economic Linkages between an Albion-based Commercial Fisherman and the Shore-based Seafood Processing, Distribution, and Support Sectors**

*Important Cost Categories and Economic Considerations.* This study and similar work conducted by IAI along the Central Coast (IAI 2010) makes clear that active commercial fishermen tend to prioritize certain economic factors and issues when discussing their fishing operations. An emphasis is often placed on the following: (a) fuel costs, (b) vessel and engine purchase and maintenance costs; (c) crew costs; (d) the availability and/or abundance of various marine resources and current pricing factors; (e) optional fishing strategies and fisheries; and (f) side jobs and alternative forms of employment.

With regard to cost factors, California gas and diesel prices have been particularly challenging in recent years, and very typically a principal consideration in one's fishing strategy. For instance, participants in the North Coast nearshore rockfish fisheries unavoidably operate on tight budgets.

Thus, as long as fish are present, most captains will operate as close to port as possible. Indeed, if resources are abundant near port, small vessels can be advantageous in that they are relatively cheap to purchase, operate, and maintain. Certain North Coast small boat fisheries have developed in keeping with this principle. This too is a significant MLPA planning consideration since certain nearshore areas amenable to small boat fishing may ultimately become off-limits.

There are other ways to save money. For instance, certain operators of large crab vessels typically crab only during the first four to eight weeks of the season and engage in lucrative federal water fishery options later in the year. For crabbers who do participate in the late season inshore Dungeness fishery, decisions to do so are typically based on calculations regarding: probable rate of pot loss; intra- and inter-fleet reports about the abundance of crab; crew costs; fuel costs; and current prices being paid for crab. One seasoned crabber summarized the basic economic principal of work in the harvest sector, stating that “every crabber has to calculate his own breaking point as to when it no longer pays to be out crabbing.”



**Figure 4-2 Recent Trends in California at-the-Pump Gas Prices**

It is an important if unfortunate fact that the marine environment is highly corrosive. Thus, fishing and crabbing are particularly hard on gear, and plying the ocean is particularly hard on vessels and engines. As such, fishermen must continually maintain their equipment, and purchase of new fishing gear and vessel components is an ongoing necessity. Minimum support sector requirements are said to include: a marine supply store, a fabricator, a welder, a mechanic, an electrician, a refrigeration specialist, a woodworker, a fiberglass worker, and haul-out facilities.

As depicted in Table 4-20 below, recent survey-based economic research conducted by Hackett et al. (2009) estimates fixed and variable costs for commercial fisheries conducted from ports in Del Norte, Humboldt, and Mendocino Counties. The results are useful in that they rank costs by fishery, and provide an inventory of typical variable and fixed costs by fishery.

**Table 4-20 Total Annual Costs for Commercial Fleets Operating in the North Coast Region**

| <b>Occupational Configuration</b>                | <b>Fixed Costs</b> | <b>Variable Costs</b> | <b>Total Cost</b> |
|--|--------------------|-----------------------|-------------------|
| Dungeness Crab– Medium & Large Vessels           | 5,798,289          | 5,590,307             | 11,388,596        |
| Trawl  | 701,997            | 2,087,711             | 2,789,708         |
| Salmon & Dungeness Crab – Medium & Large Vessels | 1,236,866          | 855,733               | 2,092,599         |
| Salmon   | 648,720            | 356,049               | 1,004,770         |
| Nearshore and Groundfish Trap                    | 466,918            | 371,906               | 838,824           |
| Dungeness Crab – Small Vessels                   | 164,043            | 512,210               | 676,253           |
| Longline   | 354,868            | 181,424               | 527,293           |
| Sea Urchin                                       | 300,923            | 202,887               | 503,811           |
| Hook-and-Line (live)                             | 295,453            | 198,612               | 494,064           |
| Hook-and-Line                                    | 208,089            | 169,596               | 377,685           |
| Salmon and Albacore                              | 145,021            | 94,886                | 239,907           |
| Prawn Trap                                       | 79,819             | 36,372                | 116,191           |
| All Other  | 47,938             | 67,028                | 114,966           |
| Total  | 10,439,945         | 10,724,723            | 21,164,668        |

Common fixed cost categories include: engine purchase and repair; electrical gear purchase and repair; hull purchase and repair; fishing gear purchase and repair; vessel insurance; storage; interest on payments; federal and state taxes; boat registration, permit, and commercial license fees; and home and transient slip fees. Variable or trip cost categories include: bait, crew wages, food, fuel, harbor, ice, transportation, association membership fees, and landing taxes. Each of the cost categories may potentially be subject to increases or decreases as a result of any new fishing regulations in the study area, including area-specific regulations associated with new marine reserves.

Finding and keeping crew is a common topic of discussion among participants in the North Coast crab fishery. Other nearshore fisheries also require the ongoing assistance of crew, but to a lesser extent. Youthful crew members are reportedly hard to keep employed due to the seasonality of many fisheries and the availability of state unemployment benefits which for some can offset the need to work on a consistent basis.

*Fishing and the Challenges of Weather, Sea, and Oceanographic Conditions.* Weather, sea, and oceanographic factors and conditions are particularly important aspects of fishing across the world's oceans. Environmental conditions can significantly affect patterns of use of California's nearshore marine ecosystems, and this is certainly the case along the North Coast, which is exposed to some of the most powerful storms and swells on the planet. The description is intended to further understanding of the complex nature of the region's marine fisheries and the factors which influence captains' decisions to use or avoid certain ocean areas during certain periods of times when conditions are not optimal.

Weather and sea conditions are an immediate and profound planning consideration for any fishing trip. Seasoned captains with sturdy commercial vessels and reliable engines are more likely to engage and persist in challenging conditions than the average recreational captain. But for many days of the year along the rugged North Coast, even the most experienced and well-equipped captains will stay at port. This constraint can have a profound effect on production, especially since the allowable number of fishing days is often limited to a certain number of days per season or by available quota. Thus, weather and sea conditions can effectively shorten a regulatory season, as is the case, for example, in the commercial hook-and-line rockfish fishery. Avid participants in this fishery and in the nearshore charter fishery estimate that some 25 to 30

percent of allowable fishing days are lost to poor weather and sea conditions. Persons knowledgeable of the area's recreational fisheries, estimate that as many as 40 to 50 percent of the open seasons are lost to poor conditions. Viable seasons for kayakers, divers, and persons who gather in the inter-tidal zone are in effect even shorter seasons given ongoing requirements for calm conditions.

The interaction between wind and wind-influenced sea surface conditions, swell conditions, tide, fog, and orthographic and bathymetric features significantly influence the decision-making processes of North Coast fishermen. Large swells and certain tidal stages can make launching or exiting and entrancing harbors especially difficult, particularly in areas of maximum exposure to the west and northwest (and southwest during southwest swell events). For instance, tidal conditions interacting with swells and winds can make launching at Shelter Cove and exiting and entering Albion Harbor and Humboldt Bay quite difficult, often resulting in cancelled or shortened fishing trips.

Such factors can also lead fishermen to find sheltered areas in which to access the ocean and fish during challenging sea and weather conditions. For example, key informants report that recreational fishermen will often travel from Brookings, Oregon to fish from Crescent City during the winter months, since Crescent City Harbor is relatively well-protected from the west. Similarly, some large commercial crab vessel captains avoid the seasonal travails of entering and exiting Noyo Harbor by mooring in Eureka, and captains of small sea urchin vessels working from Albion typically plan their activities around the challenges of re-entering the harbor.

Small-vessel captains often discuss strategies for adapting to seasonal changes in weather and sea states. In the Crescent City area, many small-boat captains prefer fishing in the lee of Point St. George during certain times of the year. In the Fort Bragg area, sea urchin divers, who typically dive close to shore, seek areas protected from winter southerlies and spring northwesterlies. Eureka-area fishermen note that by the afternoon hours, wind and chop are commonly at their worst between Eel River and Steamboat Rock, or about 10 to 25 nautical miles south of the entrance to Humboldt Bay. This area is often best avoided by small vessels. In the Fort Bragg area, crabbers note that relief from confused seas can often be found at Usal Bight.

Such considerations are important in the MLPA planning process. Placement of MPAs has the potential to redirect typical patterns of use, including use of coastal features for purposes of protection from dangerous sea and weather conditions.

The act of fishing and setting pots should also be considered in terms of the effects of weather and sea conditions. For instance, big storms can further the tendency of crab pots and lines to entangle. Pots can also drift into and mire in muddy areas and kelp beds, often requiring time-consuming and dangerous effort to rectify. For recreational and commercial divers, winter swells often necessitate moving away from the shoreline to avoid surge and swells. Visibility can also be limited during storm and swell events.

Clearly, changing oceanographic conditions also affect fishing and crabbing and the strategies and decisions of participants in the various fleets. Species abundance and the distribution of availability and abundance fluctuate in ways that are not readily predictable. For example, crabbers often assert that crab hot spots shift from year to year and even within a given season.

Likewise, the location of salmon tends to vary during and between seasons. Location of quality sea urchins also tends to vary, depending in part on the variable quality of kelp.

***Important Dimensions of the Recreational Sector.*** Extensive revenue is generated by non-resident recreational fishermen who travel to and stay in North Coast communities to engage in often costly fishing, crabbing, and diving activities. Indeed, from an economic perspective, just as revenue flows through a system of harvesters, buyers, processors, distributors, and commercial fishing support sector businesses, so it also flows through a system of anglers and recreational fishing support sector businesses. Basic components of the North Coast recreational fisheries support sector are depicted in Map 4-6 below.

Much recreational fishing activity is seasonal in nature, and in the warmer, calmer months, North Coast campgrounds, RV parks, and local hotels are often booked to capacity, with many anglers and their families also patronizing local restaurants, stores, gas stations, and laundry services. Charter fishing operations are also widely patronized during good weather months.

Owners of charter operations must address the full range of fixed and trip costs, with many expenditures relating to maintenance of vessels, gear, and crew, and to the safety and enjoyment of the patrons. Charter fishing straddles the commercial and recreational fishing industries and in many ways constitutes its own form of industry.

Pendelton and Rooke (2006) compare recreational fishing expenditures for charter patrons and private boat anglers in California. Average daily expenditures for charter patrons in Northern California were \$128 for residents and \$374 for non-residents. Average daily expenditures for resident and non-resident anglers using their own vessels were \$50 and \$198, respectively (Pendelton and Rooke 2006:12).

A variety of trip-related expenses are incurred when fishing from privately owned recreational vessels. These include: travel to the harbor; food; fuel for the vessel; launching fees where applicable; various fishing gear; bait; and ice. There are also numerous durable goods costs, such as: the fishing vessel; one or more engines; vessel necessities such as anchor, mooring lines, running lights, and safety equipment; marine electronics; mooring fees; vessel registration fees; storage fees; insurance; and maintenance of truck and vessel trailer.










For those fishing enthusiasts who persist in the activity over time, cost categories and expenses tend to expand. For instance, certain Eureka-based anglers contacted during this study discussed their personal angling histories, which typically began with shore- and pier-based fishing during childhood and progressing through a series of boats as they grew older, including small skiffs used in or just outside of Humboldt Bay, to larger, faster, and more expensive vessels that enabled access to offshore tuna grounds.



### Map 4-7

### Recreational Fishing Support Sector

This map depicts area businesses of importance to North Coast recreational harvesters as indicated by key informants through ethnographic interviews. The category of accommodations includes: hotels, motels, bed and breakfasts, and vacation rentals.








-  Charter
-  Marina/Pier/Boat Launch Facility
-  Fuel Dock
-  Boat Sales
-  Vessel Maintenance & Repair
-  Accomodations
-  Campground/RV Park
-  Non-specialized Tackle Store
-  Gear, Bait & Dive Supplier

Crescent City

101

Del Norte County

Siskiyou County

     (numerous)  
      (numerous)

Trinidad

McKinleyville

Arcata

Eureka

      (numerous)  
     (numerous)

   (several)


Trinity County

Shasta County

Rio Dell

Humboldt County

Trinity County

          (several)  
      (numerous)

Shelter Cove










Garberville

   (numerous)  
  

Tehama County

Westport

Mendocino County

          (several)  
          (several)

Fort Bragg









Caspar

Mendocino

Little River

Albion

Manchester

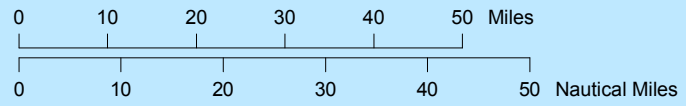
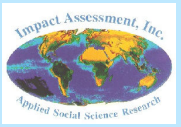
    (numerous)  
   

Glenn County

Lake County

Sonoma County

Yolo County



Key persons knowledgeable of recreational fisheries describe twelve important fishing equipment providers in Humboldt County. These businesses provide a wide range of products for fishermen, divers, and boaters. Informants also noted that many residents and visitors buy fishing supplies through non-specialty retail stores, such as hardware or sporting goods stores.

Recreational fishing businesses vary in terms of specialization and diversification of products, services, and locations. Two firms in the region are highly diversified in terms of products and services offered, and both operate stores in more than one North Coast community. At other end of the continuum are numerous locally owned businesses that specialize in relatively few products and only in one location. There is a high degree of duplication of some products across all goods providers – for example, all twelve businesses sell fishing tackle.

Key informants in the recreational fishing sector discussed a variety of contemporary challenges currently confronting the industry. These include: the deleterious economic effects of the closed and shortened salmon seasons between 2007 and 2009; rockfish seasons that have been abbreviated by new regulations; competition from online and chain store businesses; increased shipping costs; and a general lack of demand and inability to move inventory due largely to the current economic climate. Storeowners contacted during the study estimate that business losses due to the salmon closures were between 20 and 50 percent. Of note, not all business owners received salmon disaster relief funds.

Some recreation-oriented business owners say they have found new opportunities due to the popularization of kayak fishing. A new halibut fishing trend among recreational anglers has also increased sales of certain gear.

The 2009 salmon season, which limited fishing to the KMZ, was reportedly beneficial to numerous recreational fishing businesses in Eureka and Crescent City. Some regulations obviously constrain recreational activity, however. Key recreational regulations are summarized in Table 4-21 below.

**Table 4-21 Key Regulations Affecting Recreational Fishing along the North Coast**

| <b>Species/Gear or Mode</b>  | <b>(Open) Season</b>  | <b>(Closed) Areas</b>   |
|------------------------------|---|---|
| Abalone                      | Open April through November, with the exception of July.  | MacKerricher State Marine Conservation Area and Point Cabrillo State Marine Conservation Area |
| California Halibut           | Open year round   | NA  |
| Dungeness Crab               | Open first Saturday of November through July.   | NA  |
| Pacific Halibut              | Open May 1 through October 31   | Punta Gorda State Marine Reserve  |
| Rockfish complex and Lingcod | Currently open May 15 through August 15 (south of 40°10')/September 15 (north of 40°10') for boat anglers. Open year-round for shore-based anglers and divers targeting rockfish and open April 1 through November 30 for divers and shore-based anglers targeting lingcod. | Closed from 20 fathoms for boat anglers   |
| Salmon                       | Regulations regarding seasons dependent upon the status of the resources and vary by area with KMZ generally being more restricted. The recreational season for the whole coast was closed in 2008 and severely restricted in 2009.   |   |

Finally, it is of obvious importance that adequate marine infrastructure is critical to all North Coast fleets. Notably, public funds have recently been allocated to develop and maintain such infrastructure. For example, the City of Eureka and the Humboldt Bay Harbor, Recreation, and Conservation District have recently funded a new ice plant, a boat yard, and various launch ramps. Public funds are also supporting maintenance of fishing-related infrastructure in Trinidad and Crescent City. Public and private sector funding for the development and maintenance of marine infrastructure is particularly relevant to this study in that new regulatory challenges could end to constrain such investment, thereby leading to cascading economic and social effects in small coastal communities that are, to greater and lesser extents, dependent on commercial and recreational fishing and associated industry.



**Calm Conditions in the Eureka Boat Basin, Autumn 2010**

## **5.0 Summary Analysis and Conclusions**

This concluding chapter provides objective assessment of how, when, where, and why new MPAs are likely to affect fisheries in the study region. We begin by reviewing those aspects of the North Coast region that make it and its communities and fishing-related industries vulnerable to regulatory and other sources of change. This is followed by brief review of the approach and rationale for the assessment, discussion of the MPA siting process, and discussion of the array that was ultimately adopted by the Blue Ribbon Task Force (BRTF) for implementation under the MLPA. The Enhanced Compliance Alternative and the revised North Coast proposal are reviewed in brief. Based on analysis of new and existing primary and secondary source data, we then examine the likely effects of each new reserve for the fleets and shoreside support and distribution sectors that have historically been associated with what will now likely be restricted fishing grounds. Summary review of key study findings concludes the report.

### **5.1 The Regional Context**

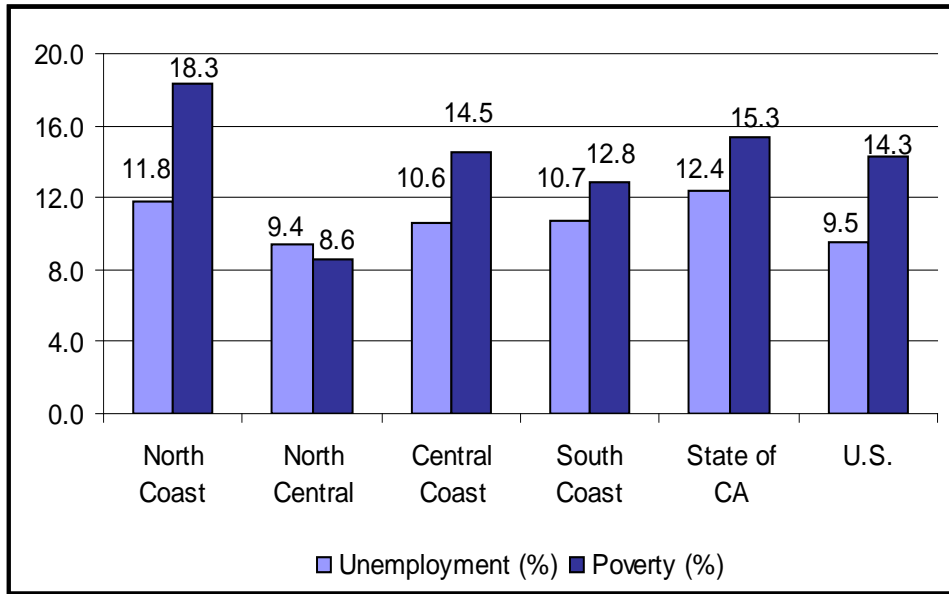
***Sociodemographic Context and Vulnerability.*** The counties and communities of the North Coast are in certain ways significantly different from those in other coastal regions of the state. We assert that population size is an important indicator of differences between the MLPA regions. The North Coast is sparsely populated with relatively extensive engagement in commercial fisheries and relatively limited participation in recreational fishing. Consumption-oriented fishing is particularly important in certain areas. Areas to the south of the North Coast region tend to be relatively densely populated with a much greater level of involvement in recreational fisheries.

As indicated in Table 5-1 below, the study area is indeed the least populous of the four principal MLPA regions, and rates of unemployment and poverty are significantly higher than in the other regions and state as a whole (Figure 5-1). Similarly, household income levels in North Coast communities are significantly below those of the nation, state, and other coastal California regions (Figure 5-2). Among the North Coast counties, rates of unemployment and poverty are highest in Del Norte County (Figure 5-3), with the most challenging conditions noted in Crescent City (Figure 5-4).

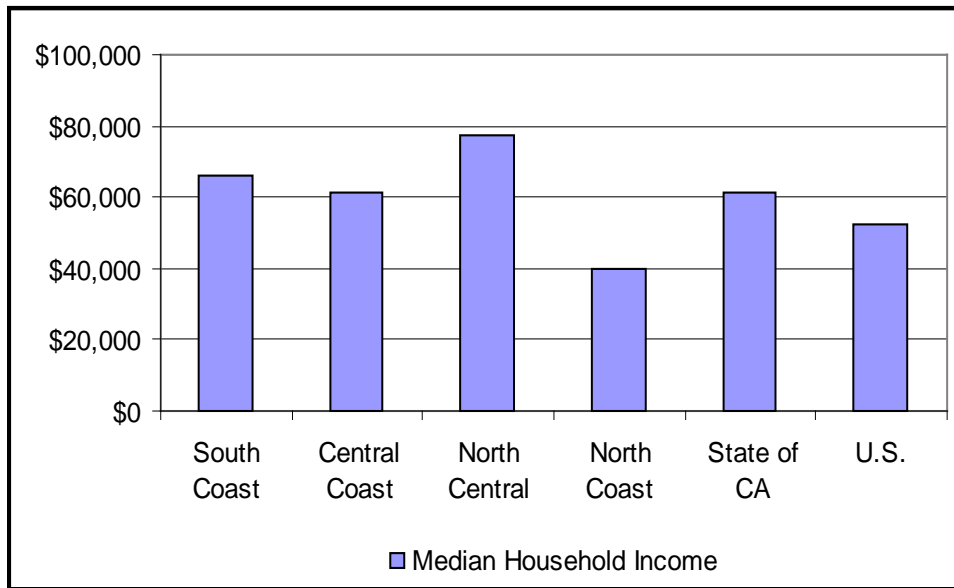
**Table 5-1 Population of MLPA Regions**

| <b>Region</b>       | <b>Total Population</b> |
|---------------------|-------------------------|
| South Coast         | 16,980,516              |
| North Central Coast | 2,291,402               |
| Central Coast       | 918,985                 |
| North Coast         | 164,793                 |

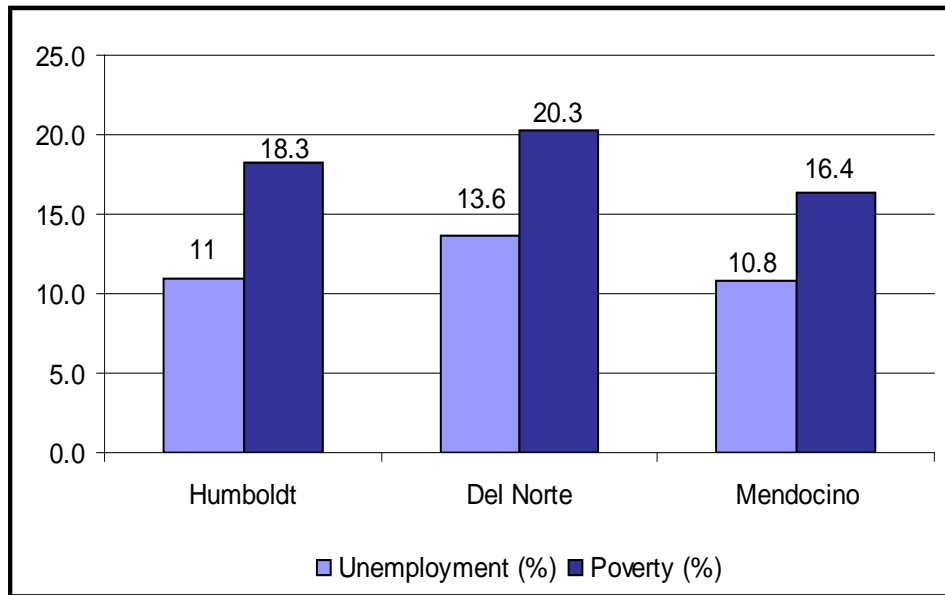
Source: U. S. Census Bureau, 2006-2008 ACS Survey



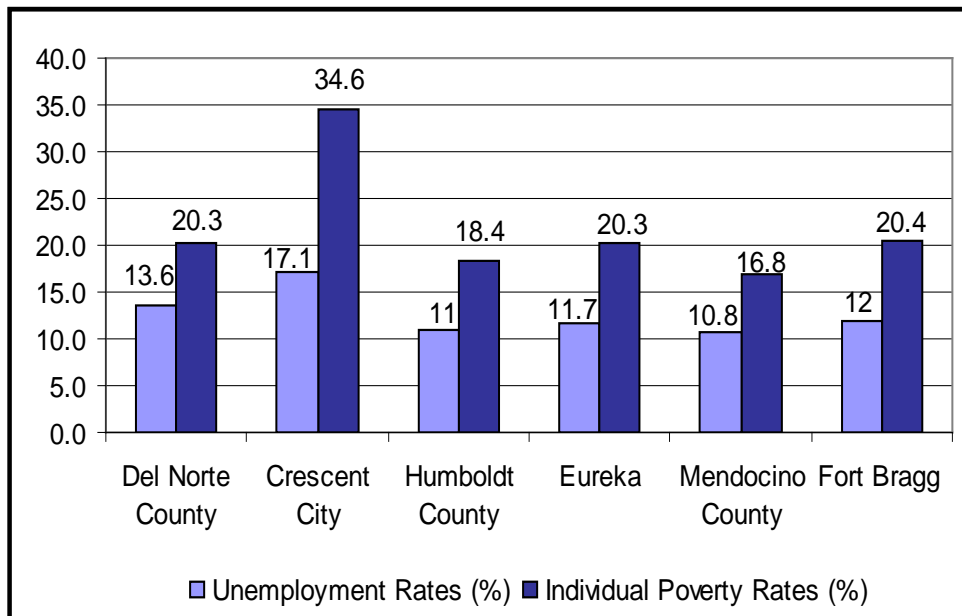
**Figure 5-1 Unemployment and Poverty Rates in 2008**  
 Sources: EDD Labor Market Info 2010; U. S. Census Bureau 2009



**Figure 5-2 Median Household Income: 2008**  
 Source: U. S. Census Bureau 2009, American Community Survey



**Figure 5-3 Unemployment and Poverty Rates among North Coast Counties: 2008**  
Sources: EDD Labor Market Info 2010; U. S. Census Bureau 2009



**Figure 5-4 North Coast Unemployment and Poverty Rates: 2008**  
Sources: EDD Labor Market Info 2010; U. S. Census Bureau 2009

***Fisheries-Specific Context and Vulnerability.*** As noted throughout this document, North Coast communities are extensively involved in and/or dependent on fishing and fishery support activities. As such, each of the study communities is in some manner and to some extent vulnerable to factors which induce changes in the region’s commercial and recreational fisheries. Perhaps the most significant and persistent source of change over the years has been regulation on commercial and recreational fishing activity. Table 5-2 below summarizes key state and federal management measures affecting North Coast fisheries since the mid-1970s. Regulations associated with the new MPAs may be seen as the latest in a long series of regulatory changes and related effects on the region’s fisheries.

**Table 5-2 Principal Regulations Affecting Marine Fisheries in the Study Region**

| <b>Year</b> | <b>Regulation</b>  |
|-------------|--|
| 1976        | Magnuson-Stevens Fishery Conservation and Management Act                 |
| 1979        | Klamath Management Zone (KMZ) Established by State of California         |
| 1982        | State Limited Entry Program for Salmon                                   |
| 1984        | Federal Restrictions on Salmon Fishing in KMZ                            |
| 1993        | Federal Opinion on Salmon Tribal Re-Allocation                           |
| 1994        | Federal Groundfish Restricted Access Program                             |
| 1995        | State Limited Entry Program for Dungeness Crab                           |
| 1996        | Magnuson-Stevens Act (SFA) Reauthorized and Amended                      |
| 1998        | State Marine Life Management Act (MLMA)                                  |
| 1998        | State Nearshore Fisheries Management Act                                 |
| 1976        | Magnuson-Stevens Fishery Conservation and Management Act                 |
| 1979        | Klamath Management Zone (KMZ) Established by State of California         |
| 1982        | State Limited Entry Program for Salmon                                   |
| 1984        | Federal Restrictions on Salmon Fishing in KMZ                            |
| 1993        | Federal Opinion on Salmon Tribal Re-Allocation                           |
| 1998        | State Finfish Trap Limit   |
| 1999        | State Marine Life Protection Act (MLPA)                                  |
| 1999        | State Nearshore Fishery Regulations                                      |
| 2000        | State Nearshore Rockfish FMP   |
| 2002        | State Rockfish Conservation Area (RCAs) Commercial Plan                  |
| 2002        | State Nearshore Fishery Management Plan (NFPM)                           |
| 2003        | Federal Essential Fish Habitat Conservation Areas (EFHCAs)               |
| 2003        | Federal Groundfish Permit Buyback Program (NMFS)                         |
| 2006        | Federal Groundfish FMP & Essential Fisheries Habitat (EFH), Amendment 19 |
| 2007        | Magnuson-Stevens Act (SFA) Reauthorized and Amended                      |

Some regulations adopted over the years have instituted spatial limitations or area-specific closures of commercial and recreational fisheries along the North Coast. As such, the measures have led to a cumulative reordering of the use of ocean space over time. Establishment of marine reserves further conditions use of this space, with positive and negative implications for the adjacent fishery support infrastructure and host fishing communities. Map 5-1 below depicts select regulations affecting the use of ocean space along the North Coast. As depicted in Map 5-2, regulations have also heavily influenced the spatial ordering of recreational marine fisheries along the North Coast and for the state as a whole.





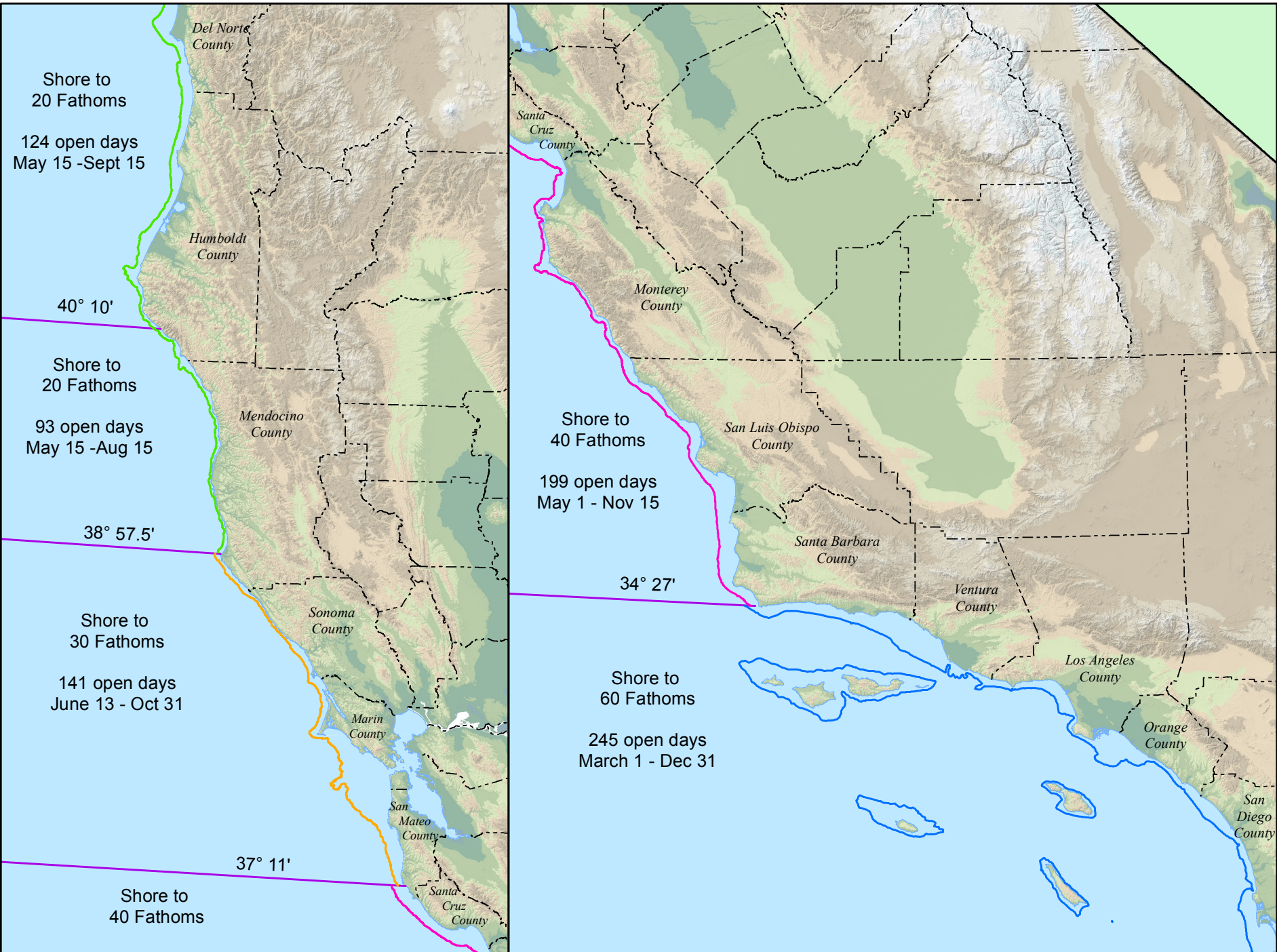
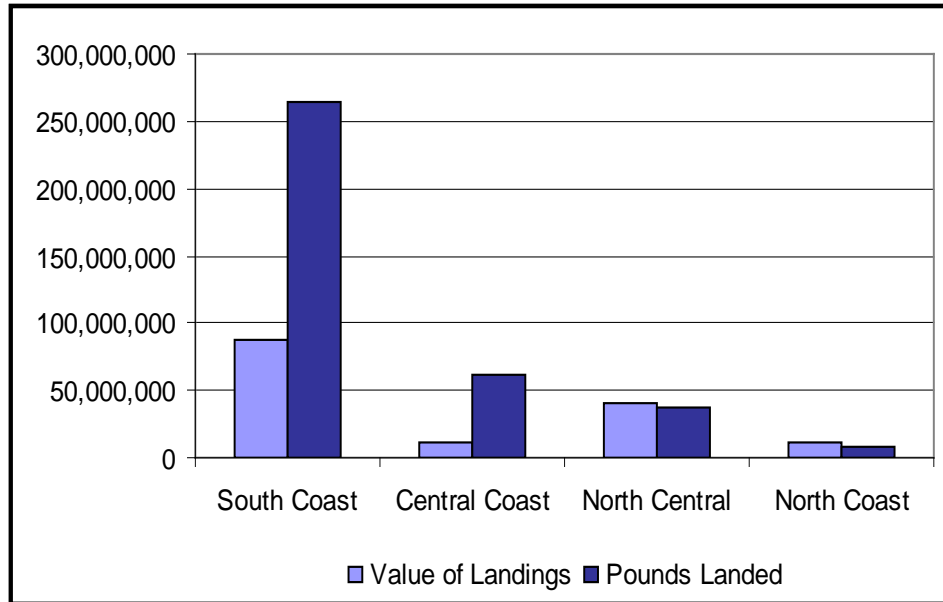
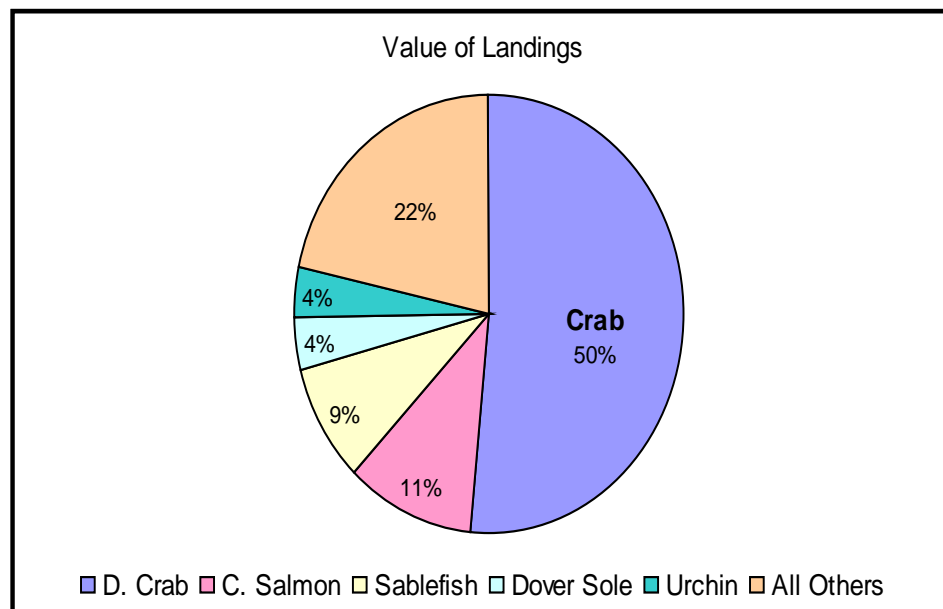


Figure 5-5 below depicts interregional differences in commercial fisheries production. Clearly, the bulk of landings and value is associated with South Coast-based fisheries. While fishing is particularly important to communities along the North Coast in absolute terms, total landings and value of landings are relatively low. At least half of all North Coast landings involve crab (Figure 5-6).



**Figure 5-5 Pounds and Value of Landings across MLPA Regions: 2009**  
Source: CDFG 2010



**Figure 5-6 Percent Value of North Coast Landings by Species: 2000-2008**  
Source: CDFG 2009

Table 5-3 below depicts the relative extent of fishing-related employment in each region. Notably, the North Coast ranks highest among all MLPA regions in terms of: (a) commercial fishermen as percent of labor force, (b) fishing industry workers as percent of labor force, and (c) fishery support businesses as percent of all businesses. Table 5-4 depicts the same variables for North Coast counties only.

**Table 5-3 Key Indicators of Involvement in Fishing-Related Industry by Region: 2008**

| <b>Region</b> | <b>Percent of Commercial Fishermen in Labor Force</b> | <b>Percent of All Fishing Industry Workers in Labor Force</b> | <b>Percent of All Businesses Supporting Fishing Industry</b> |
|---------------|---|---|--|
| North Coast   | 0.6   | 0.7   | 0.9  |
| North Central | 0.03  | 0.2   | 0.2  |
| Central Coast | 0.1   | 0.2   | 0.3  |
| South Coast   | 0.001   | 0.3   | 0.2  |

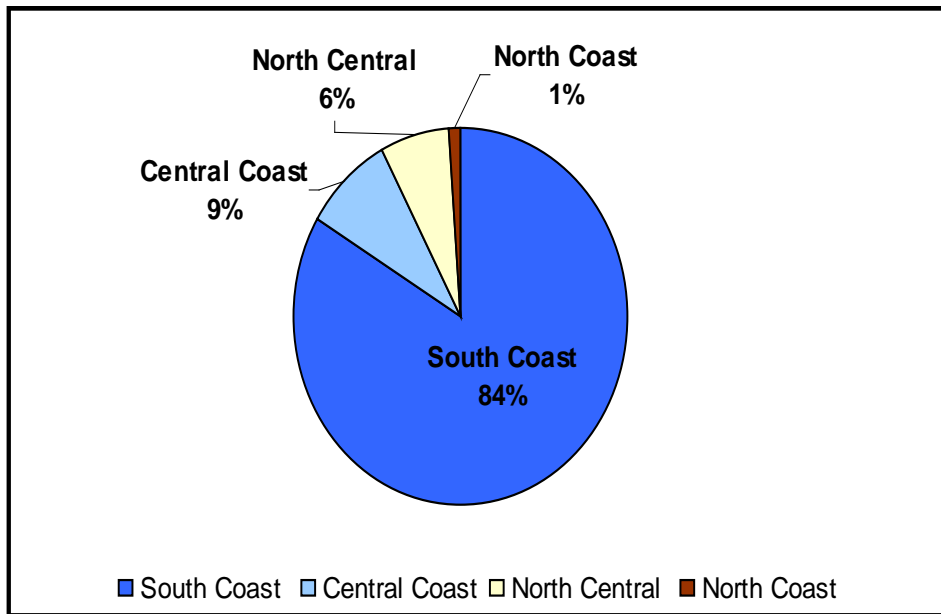
Sources: CDFG Commercial Fisheries Information System 2008; U. S. Census Bureau 2008, County Business Patterns (NAICS)

**Table 5-4 Key Indicators of Involvement in North Coast Fishing Industry: 2008**

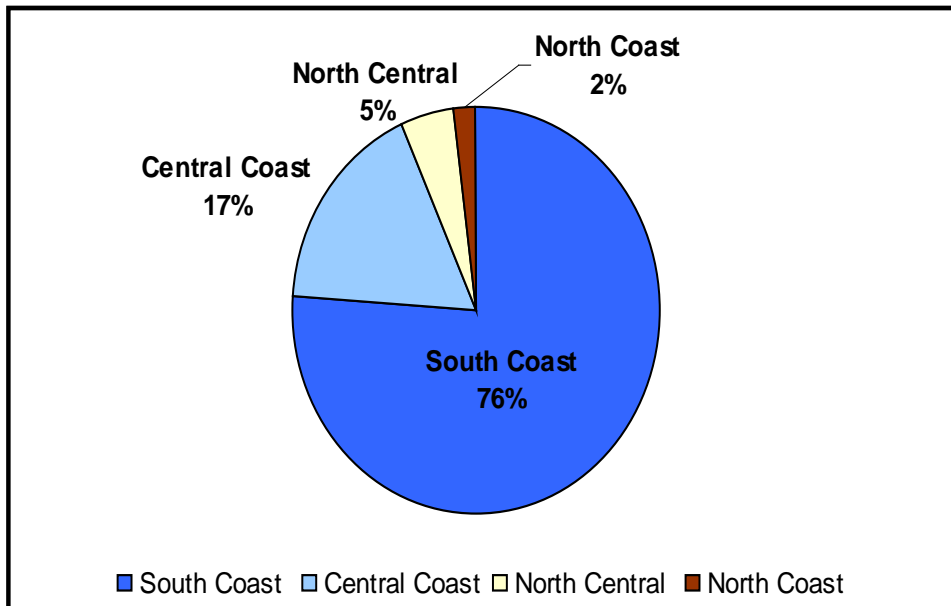
| <b>County</b> | <b>Percent of Commercial Fishermen in Labor Force</b> | <b>Percent of All Fishing Industry Workers in Labor Force</b> | <b>Percent of All Businesses Supporting Fishing Industry</b> |
|---------------|---|---|--|
| Del Norte     | 1.4   | 1.4   | 3.4  |
| Humboldt      | 0.3   | 0.6   | 0.7  |
| Mendocino     | 3.8*  | 0.8   | 0.7  |
| Total Region  | 0.6   | 0.7   | 0.9  |

\* Commercial license data is for Fort Bragg area only; data for Mendocino County south of Fort Bragg is considered by the MLPA as part of the North Central region. Sources: CDFG Commercial Fisheries Information System 2008; U. S. Census Bureau 2008, County Business Patterns (NAICS)

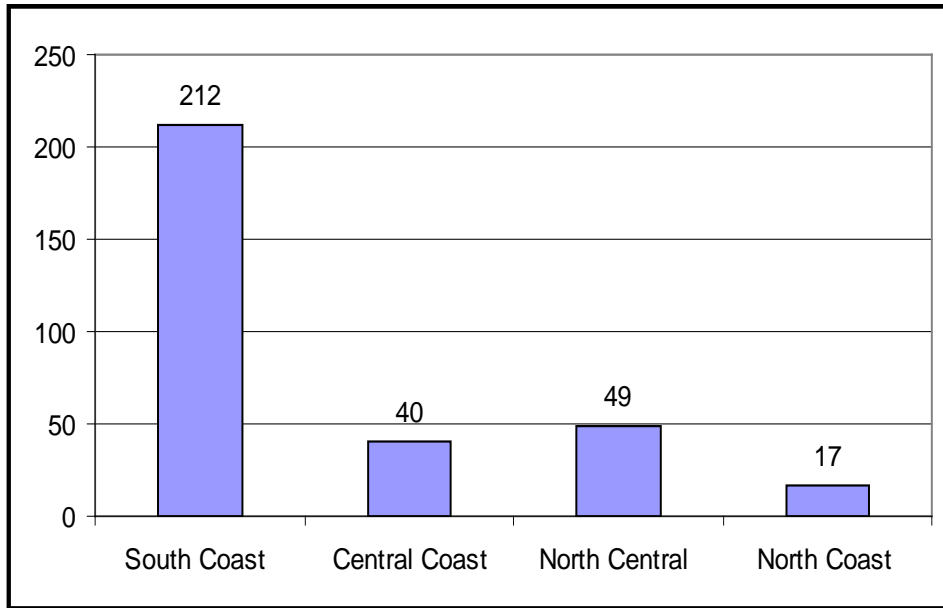
As depicted in Figures 5-7 through 5-10 below, the structure of marine fisheries also varies by MLPA region. Notably, recreational fishing activity along the South Coast region far surpasses that of the remaining regions combined. Such activity along the North Coast is minimal by comparison. For instance, charter fishing patronage and charter-specific landings occur with greatest frequency in Southern California (Figures 5-7 and 5-8), and most charter captains are based in that region (Figure 5-9). A small percentage of charter landings occur along the North Coast, and relatively few charter captains are based in the region. Similarly, most non-commercial vessels are registered to residents in the southern part of the state, and most recreational fishing activity occurs there (Figure 5-10 and Table 5-5). The relatively low level of recreational fishing activity in the North Coast region undoubtedly is an effect of: (a) a population base that is significantly smaller than that of other California coastal regions, (b) a relatively isolated geography, and (c) disproportionately challenging weather and sea conditions.



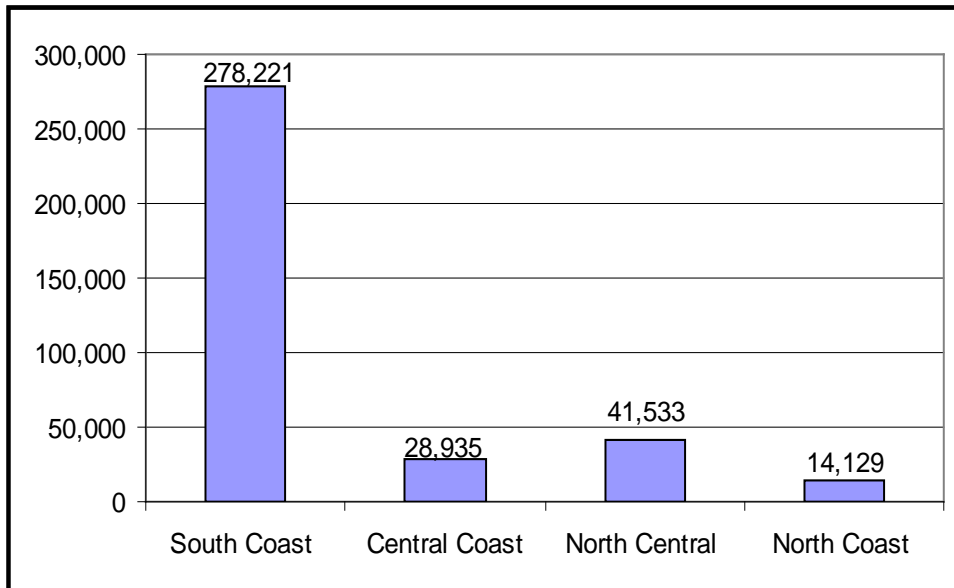
**Figure 5-7 Charter Fishing Patrons by Region: 2008**  
 Source: CDFG CPFV Annual Report 2008



**Figure 5-8 Charter Vessel Landings by Region: 2008**  
 Source: CDFG CPFV Annual Report 2008



**Figure 5-9 Number of Charter Fishing Operations by Region: 2009**  
 Source: CDFG CPFV Annual Report 2008



**Figure 5-10 Number of Registered Non-Commercial Vessels by County: 2009**  
 Source: California Department of Motor Vehicles 2010

**Table 5-5 Estimated Number of Recreational Angler Trips by Region and Mode: 2007**

| Region        | Mode of Fishing        |           |                 |                 | Total     |
|---------------|------------------------|-----------|-----------------|-----------------|-----------|
|               | Jetties and Structures | Shoreline | Private Vessels | Charter Vessels |           |
| South Coast   | 1,341,344              | 766,709   | 240,469         | 236,764         | 2,585,286 |
| North Central | 274,891                | 294,194   | 38,457          | 39,238          | 646,780   |
| Central Coast | 157,502                | 137,256   | 25,245          | 43,166          | 363,169   |
| North Coast   | 56,874                 | 59,793    | 13,983          | 10,149          | 140,799   |
| Total         | 1,830,611              | 1,257,952 | 318,154         | 1,257,952       | 3,736,034 |

Source: California Recreational Fisheries Survey 2007 Annual Review; CDFG

Weather and sea conditions are indeed challenging aspects of recreational and commercial fishing in the North Coast study region. This is illustrated in Maps 5-3 through 5-5 below.

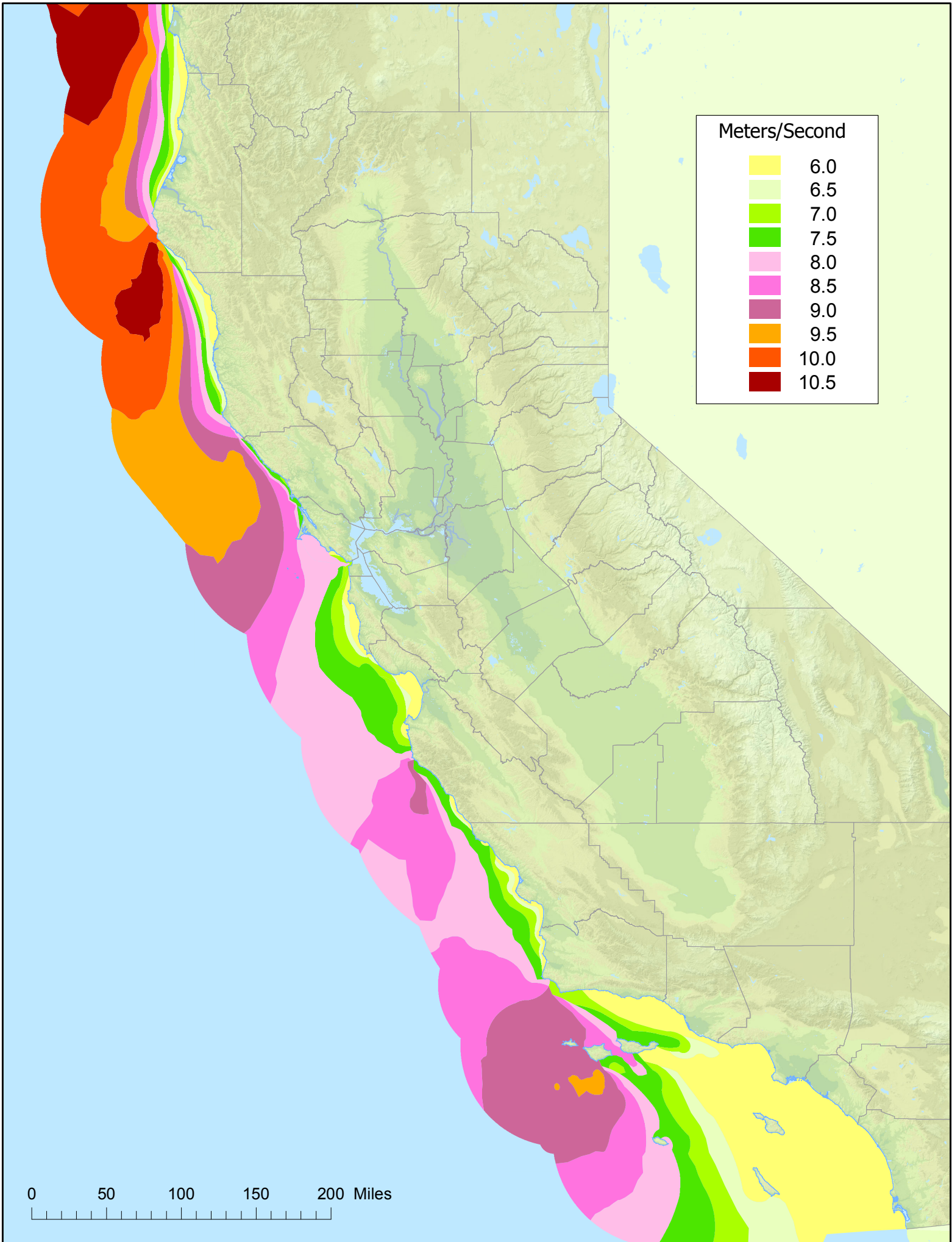
Map 5-3 uses U. S. Department of Energy data to depict average wind velocities along the California Coast.<sup>40</sup> The map clearly indicates the much windier and thus more challenging conditions confronting fishermen who are particularly mindful of weather and sea conditions, which can be highly variable and at times extreme in the northern part of the state, as suggested here.

Map 5-4 depicts safety thresholds perceived by knowledgeable fishermen in the region. The map derives from NOAA weather buoy data and in-depth conversations with commercial and recreational fishermen and fishing experts. Commercial crabbers generally report extensive challenges in winds greater than 25 knots, while recreational fishermen tend to stay at port when winds exceed 15 knots and/or seas exceed six feet. These thresholds are applied to conditions actually measured at nearshore buoys along the North Coast over a three-year period. The graphic indicates the percentage of days per month that would be considered dangerous at the offshore buoys.

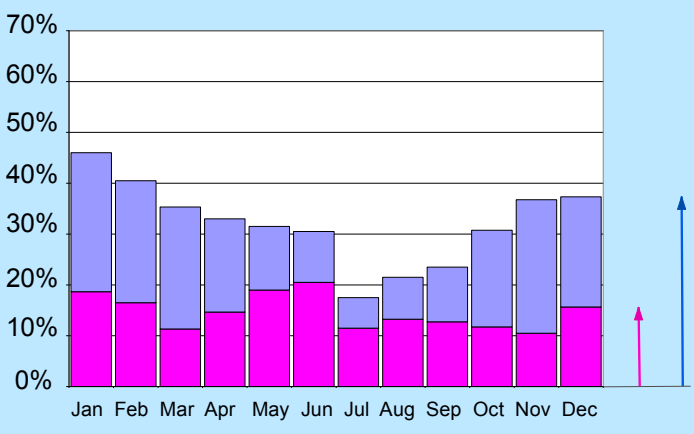
Maps 5-5 uses the same approach to compare safety thresholds vis-à-vis actual offshore conditions between a buoy located outside of Humboldt Bay and two buoys located in the California Bight. The visual underscores the fact that North Coast fishermen are relatively highly constrained by weather and sea conditions. Although there are sheltered areas along the nearshore zone of the North Coast, these are far less significant in effect than are certain nearshore areas in Monterey Bay and the California Bight.


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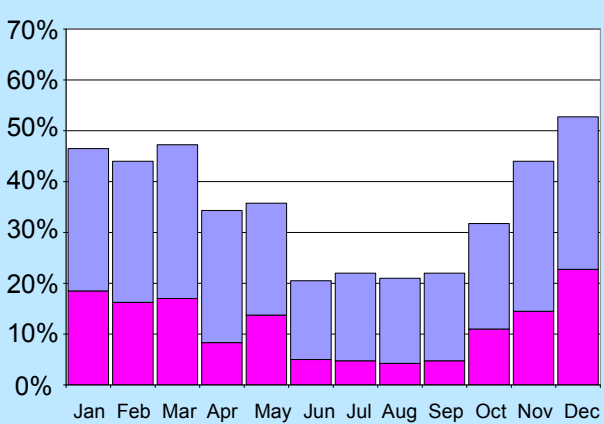
<sup>40</sup> Predicted mean annual velocities at 90 meters above the surface.



46027   
*Point St George*  
 Longitude 124°15' 24"



46022 




*Cape Mendocino*  
 Longitude 124°24' 35"

*Punta Gorda*

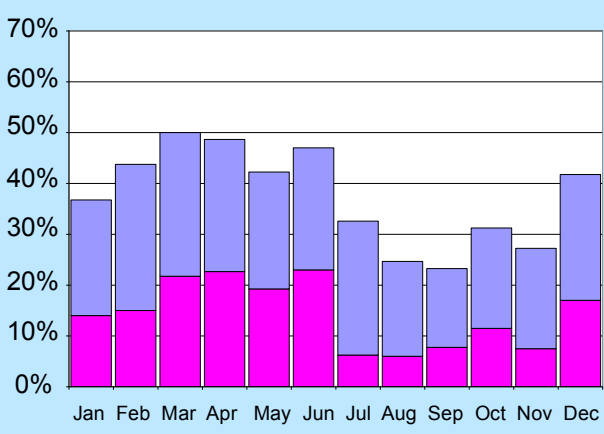
Shelter Cove


Fort Bragg


Mendocino

46014   
*Buoy*  
 Longitude 123°58'10"

*Point Arena*



 Percent of Days per Month Considered Unsafe by Typical Recreational Fishing Captain

 Percent of Days per Month Considered Unsafe by Typical Commercial Crab Vessel Captain

*Siskiyou County*

*Del Norte County*

*Trinity County*

*Humboldt County*

*Mendocino County*

*Lake County*

*Sonoma County*