

## 5.2 Toward Valid Assessment of Vulnerability and Risk

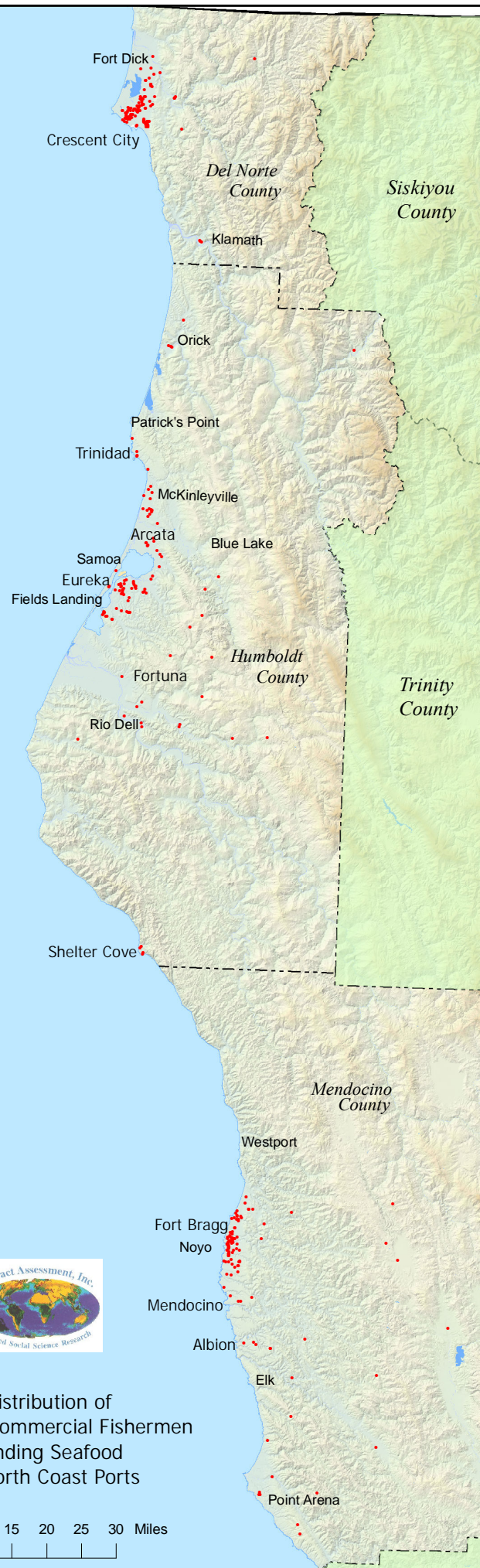
Here we initiate discussion of potential vulnerabilities and risks to the various individuals, fleets, support sectors, ports, and communities that are subject to changes associated with establishment of new MPAs in the study region. As can be noted in Maps 5-6 and 5-7 below, the field of potentially affected persons and businesses is extensive. In fact, the potential effect is significantly larger than is depicted here, since most fishing operations involve not only captains, but also crew members, friends, family members, and other persons who provide some form of direct or indirect support. Similarly, each business in the commercial and recreational fishery service and support sectors tends to involve a number of workers and, in some cases, many scores of employees.

Establishment of new MPAs has the potential to affect individuals and communities involved in marine fisheries across the North Coast. This report has thus far set the stage for analysis of the distribution of potential MPA-induced changes. In the following section, we examine the likely effects of the closures or other spatial restrictions through analysis of various baseline data and consultation with our extensive network of trusted research participants. The analysis focuses especially on: (a) the effects of the new MPAs on individuals and user groups known to use the potentially affected ocean areas for purposes of commerce and/or recreation; (b) potentially affected commercial and recreational fishery support sectors; and (c) potentially affected seafood distribution sector businesses.

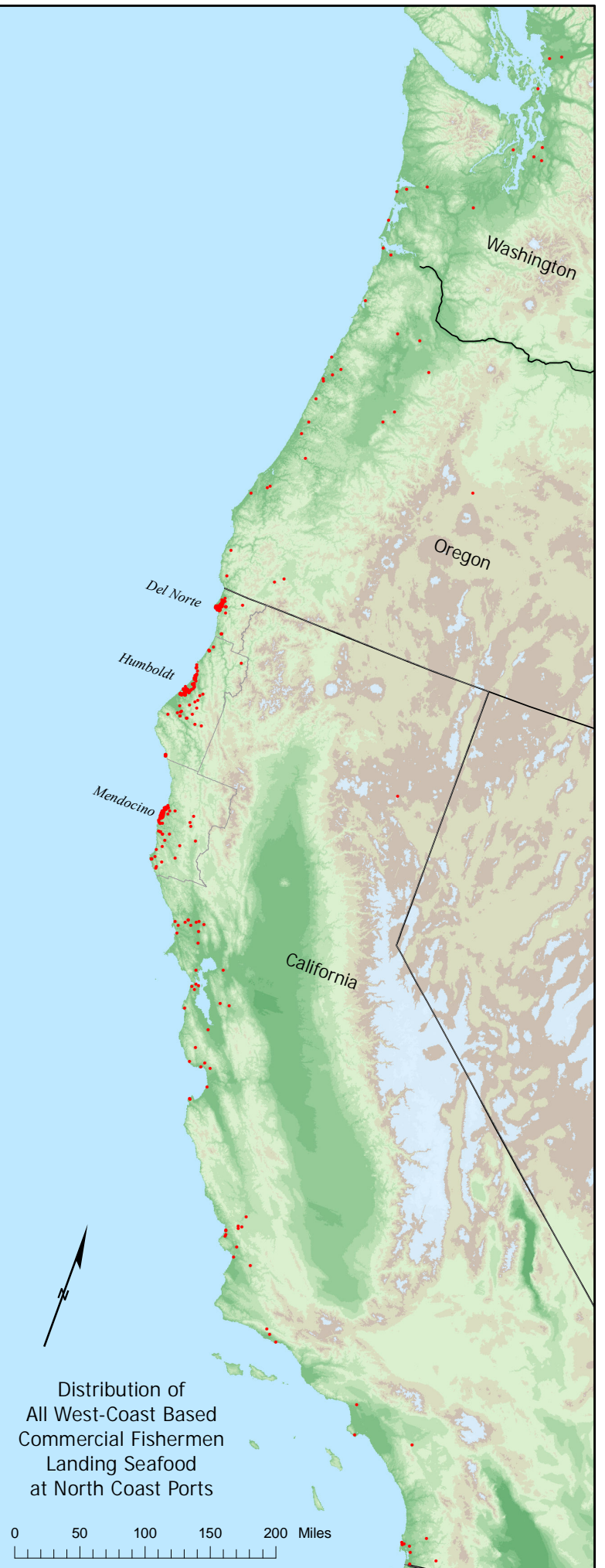
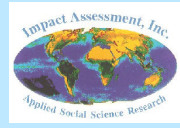
The basic approach is characterized in Map 5-7 below. The map depicts a randomly selected portion of the Eureka and Trinidad area nearshore crab grounds (between 40°57' North and 41°05' 45" North), intended to simulate an area closed to fishing due to marine reserve status. The map also depicts persons recently harvesting crab in that area, and the various support sector businesses known to be patronized by the affected harvest sector.

In short, our database is of sufficient depth and specificity to enable empirical determination of the persons and businesses potentially affected by a given MPA or array of MPAs, and the nature and extent of involvement with and perceived importance of the regulated nearshore grounds. Based on identification and analytical bounding of the affected fisheries, we use existing and newly gathered information to characterize the likely effects of the new spatial regulation in question.

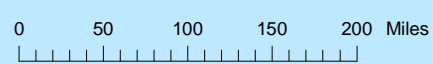
Indicators include, but are not limited to: degree of specialization and/or diversity of operations; presence or lack of alternative grounds; likelihood of displacement to unused or presently used alternative grounds; distance and related cost or safety challenges associated with displacement to alternative grounds; presence or absence of persons and/or businesses on the threshold of leaving the commercial or recreational fishing industries; presence or absence of alternative marketing vectors and opportunities; presence or absence of alternative business in the support sector; and so forth. Notably, the candidate array alternative developed by the BRTF minimizes risk to North Coast fleets, support businesses, and adjacent communities.

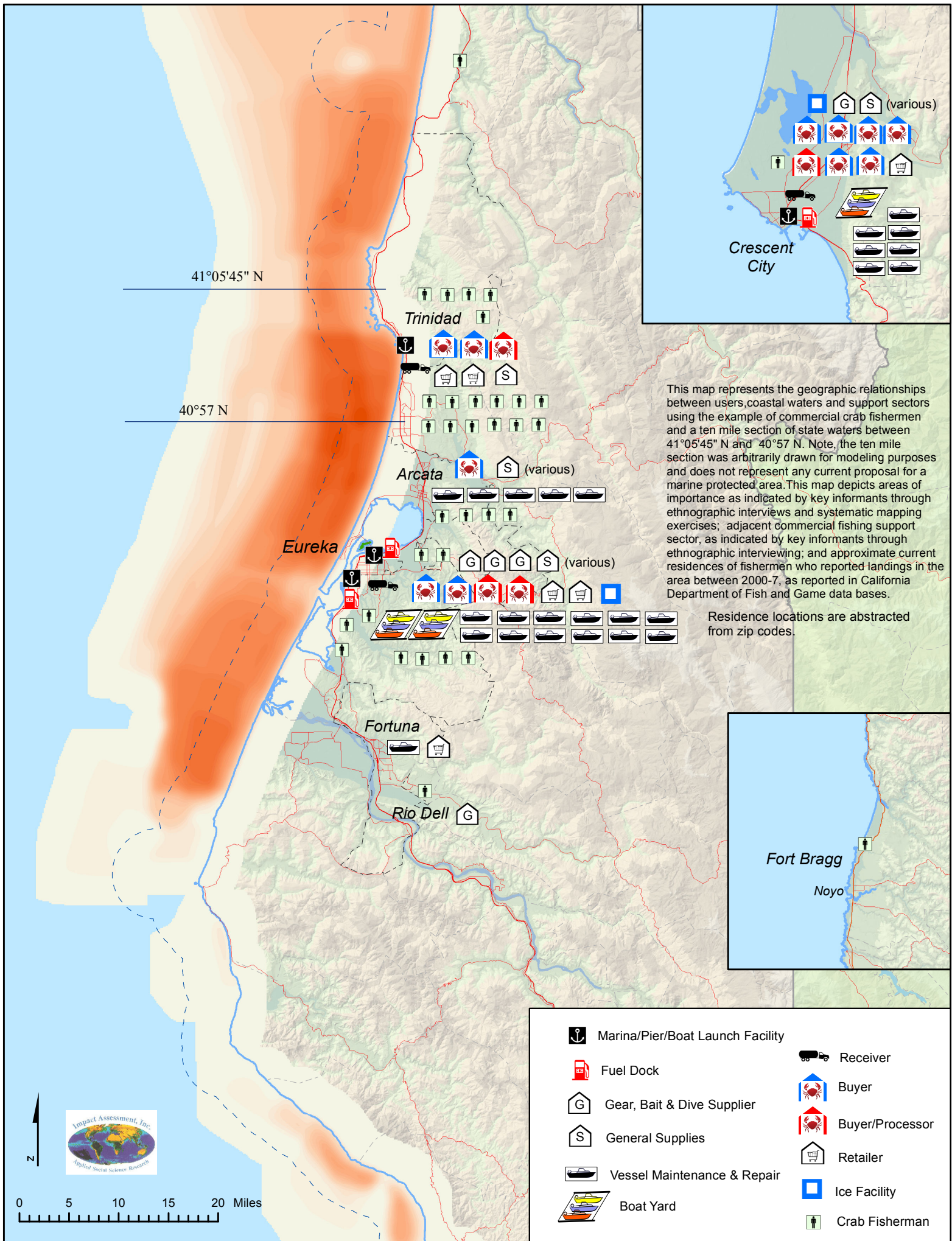


Distribution of Resident Commercial Fishermen Landing Seafood at North Coast Ports















Distribution of All West-Coast Based Commercial Fishermen Landing Seafood at North Coast Ports

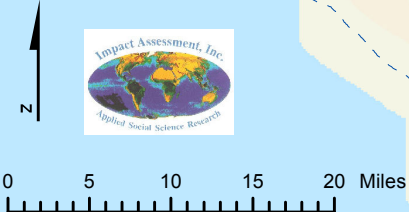




This map represents the geographic relationships between users, coastal waters and support sectors using the example of commercial crab fishermen and a ten mile section of state waters between 41°05'45" N and 40°57' N. Note, the ten mile section was arbitrarily drawn for modeling purposes and does not represent any current proposal for a marine protected area. This map depicts areas of importance as indicated by key informants through ethnographic interviews and systematic mapping exercises; adjacent commercial fishing support sector, as indicated by key informants through ethnographic interviewing; and approximate current residences of fishermen who reported landings in the area between 2000-7, as reported in California Department of Fish and Game data bases.

Residence locations are abstracted from zip codes.

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



### **5.3 Tentative Outcome of the North Coast MLPA Process**

The North Coast Regional Stakeholder Group (RSG) was comprised of 33 representatives from various North Coast agencies and organizations. The RSG convened for a total of seven two-day formal plenary meetings and informal working groups between February and October 2010 in various locations throughout the study region. The intent of the meetings was to collaboratively develop a preferred array for presentation to the Blue Ribbon Task Force (BRTF). The plenary meetings were open to the public and videotaped for simultaneous webcasting and later viewing on the internet. The RSG worked in coordination with a facilitation team, a science advisory team, and staff from the MLPA Initiative, CDFG, and the California Department of Parks and Recreation.

Formulation of draft MPA array proposals was initiated in June 2009. Many participants were later nominated as RSG members and their ideas informed an ongoing process. The RSG continued to develop proposals, each of which was made available to the public for comment. On October 25, the RSG presented a single unified array to the MLPA Initiative, and the BRTF. The proposal was ultimately endorsed by 19 local government agencies, including: Mendocino, Humboldt, and Del Norte Counties; the cities of Monterey, Point Arena, Fort Bragg, Willits, Lakeport, Ukiah, Fortuna, Ferndale, Eureka, Arcata, Blue Lake, Trinidad, and Crescent City; the Shelter Cove Resort Improvement District; the Humboldt Bay Harbor, Recreation, and Conservation District; and Crescent City Harbor District.

After slight modifications were made by the RSG in consultation with MLPA staff during the BRTF meeting of October 25-26, the RSG proposal was unanimously approved by task force members as the Revised Round Three North Coast Regional Stakeholder Group Proposal (RNCP) to be forwarded to the California Fish and Game Commission. Changes involved the renaming of three proposed MPAs and modifications to allowed tribal uses. In addition, the BRTF recommended an alternative proposal termed the Enhanced Compliance Alternative Proposal (ECA). This aims at recognizing some tribal non-commercial uses while increasing the level of overall protection offered by the array. Finally, the BRTF adopted motions including: recommendations for co-management between tribes and tribal communities and relevant state agencies; the retention of three existing MPAs; the inclusion of additional tribal uses in reserves proposed for bays and estuarine areas in the region; and the re-designation of two SMRMAs as SMRs due to the non-presence of waterfowl hunting in the areas.

Scientific evaluation of the two proposals – the Revised Round Three North Coast Regional Stakeholder Group Proposal (RNCP) and the North Coast Enhanced Compliance Alternative Proposal (ECA) - will be discussed and potentially approved on January 13, 2011. On February 2, 2011, the RNCP and ECA will be presented to the California Fish and Game Commission. A state regulatory and environmental review process will be initiated shortly thereafter under the Administrative Procedure Act (APA) and California Environmental Quality Act (CEQA), respectively. A public comment period and/or public hearings will be provided.

Map 5-8 depicts the location and specific form of regulations associated with each candidate reserve, as outlined in the RNCP. Note that proposed regulations accommodate tribal take of various marine fish species, marine invertebrates, and marine aquatic plants. As noted previously, the scope of this study does not include information on tribal uses or assessment of effects on those uses. As such, the following section does not address regulatory exclusions for or impacts to tribal groups for traditional, non-commercial uses as noted in or resulting from the RCNP. The ECA was proposed to recognize (some) traditional non-commercial tribal uses while at the same time increasing the level of protection for MPAs. Insofar as the ECA was not intended to increase regulations on current commercial and recreational uses or user groups, over and above those of RNCP, we are basing our discussion of impacts on the RCNP only.

#### **5.4 Anticipated Effects of the Candidate MPAs**

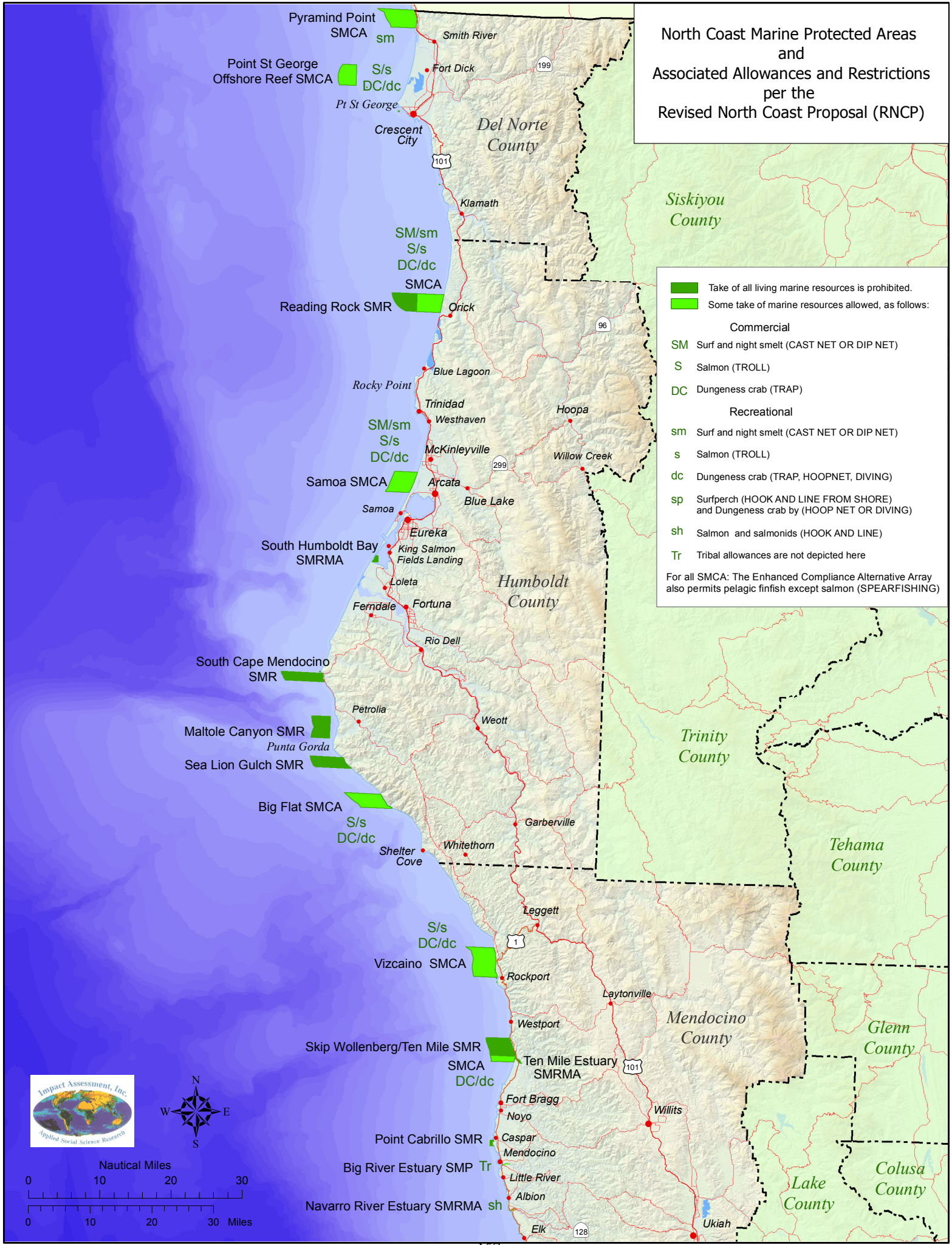
This section examines various risks posed to fleets and communities through establishment of new marine reserves and associated regulations on fishing activity along the North Coast. It is noted at the outset that the various stakeholder groups worked extensively to minimize any undue detrimental socioeconomic impacts that could result from establishment of MPAs in the region, and that this effort was largely successful. Thus, as noted in the following discussion, problematic contemporary effects generally are limited to a few specific cases and fisheries.

However, the process did require that certain historically important fishing grounds and/or potentially important grounds be sacrificed through successive site planning iterations and negotiations. Moreover, while the outcome of stakeholder participation was deemed successful by many in the region in that a unitary candidate MPA array was ultimately identified, the MLPA process itself did generate some measure of social tension within and between stakeholder groups, and it did necessitate the time-consuming participation of many individuals in local government agencies and private sector entities.

This section of the report is organized geographically, with each candidate MPA and its potential implications discussed in geographic sequence, beginning with those in Del Norte County, moving southward through Humboldt County, and progressing finally to the southernmost reserve in Mendocino County. The discussion addresses: (a) the location, size, and important attributes of the reserve in question; (b) the principal fleets and recreational groups known to use the candidate MPAs and adjacent areas; (c) the nature of select physical-environmental, economic, and regulatory factors that have conditioned pursuit or use of marine resources in and around those reserves; and (d) the likely effects of the candidate reserves as reported by user group representatives and as indicated by IAI's empirical research of the affected fleets, fisheries, and communities. Readers are also directed to Appendix A, which supplements the following discussion with maps depicting the typical maximal ranges of the various fleets vis-à-vis the candidate MPAs.

**North Coast Marine Protected Areas  
and  
Associated Allowances and Restrictions  
per the  
Revised North Coast Proposal (RNCP)**

- Take of all living marine resources is prohibited.
  - Some take of marine resources allowed, as follows:
    - Commercial**
    - SM** Surf and night smelt (CAST NET OR DIP NET)
    - S** Salmon (TROLL)
    - DC** Dungeness crab (TRAP)
    - Recreational**
    - sm** Surf and night smelt (CAST NET OR DIP NET)
    - s** Salmon (TROLL)
    - dc** Dungeness crab (TRAP, HOOPNET, DIVING)
    - sp** Surfperch (HOOK AND LINE FROM SHORE) and Dungeness crab by (HOOP NET OR DIVING)
    - sh** Salmon and salmonids (HOOK AND LINE)
    - Tr** Tribal allowances are not depicted here
- For all SMCA: The Enhanced Compliance Alternative Array also permits pelagic finfish except salmon (SPEARFISHING)



## **Anticipated Effects of Candidate MPAs in Del Norte County**

***Pyramid Point SMCA.*** Pyramid Point SMCA is the northernmost of the proposed reserves. Its northern boundary is situated along the California/Oregon border about 2.5 nautical miles south of Brookings, Oregon. The southern boundary of the SMCA is approximately 17 nautical miles north of Crescent City. The small community of Smith River is located about five miles southeast of the SMCA's southern boundary, and the mouth of the Smith River is located less than one nautical mile south. U. S. Highway 101 is adjacent to the MPA.

The Pyramid Point SMCA encompasses nearly 14 square miles of ocean, with a shoreline span of 2.9 miles. The reserve is some 124 feet in depth at its deepest point offshore. The ocean floor here is primarily a soft bottom substrate of sand and mud. Similar habitat extends south of the proposed SMCA and west into federal waters. Wide swaths of relatively flat, soft bottom which are fed by sediment from the Smith River, make the area a prime location for commercial crabbing. The SMCA also contains some hard bottom and offshore rocks. More extensive hard bottom and offshore rocks are also found approximately eight nautical miles south at Point St. George.

The user group most likely to be directly affected by the new designation involves the ~30 small-boat crabbers based in nearby Brookings, Oregon. The principal risk in this case is displacement of the fleet to areas immediately south of the SMCA where some 30 to 40 captains and crew of small- and medium-sized vessels based in Crescent City are often already active. Reportedly, there is thus some potential for increased crowding and gear entanglement south of the MPA. Repair or replacement of lines and/or pots and re-baiting would incur time and materials costs and safety considerations for the affected participants.

A highly mobile fleet of large crab vessels from Crescent City and other ports in the larger region also use the area on occasion and thus may be affected. Such effects would occur in lesser fashion than for the small boat crab fleet given more extensive range and spatial options available to captains of large crab vessels. Because the Dungeness crab fishery is relatively lucrative and thus highly competitive, respondents believe that any diminished volume of crabs resulting from loss of grounds around Pyramid Point would be readily replaced with crabs caught in adjacent waters.

Inshore areas of the candidate SMCA provide habitat for rockfish. Boat anglers and charter operators based in Brookings Harbor will likely move to other favorable areas north of the MPA and around Brookings Harbor. The recreational fleet based at Crescent City enjoys better and closer options for rockfish fishing and would not be significantly affected.

Pyramid Point SMCA contains popular grounds for recreational and commercial take of surf smelt. Surf smelt are commonly targeted from the beach in areas of pea gravel sand. The fish are taken by net during spawning periods: these are May through September for day smelt, and January through June for night smelt. Buyers sell the product to aquariums, zoos, and animal parks as food for captive marine mammals. Reportedly, less than 20 fishermen in the



Eureka/Del Norte areas are currently permitted for commercial take of smelt. Commercial participation has varied over time in relation to levels of abundance and market prices. Over the last decade, fishing activity reportedly has diminished. Both recreational and commercial smelt fishing have been constrained in recent years by restrictions on vehicular beach access. Given SMCA allowances for continued recreational and commercial smelt fishing, no impact to this sector can be anticipated.

Regulations restricting the season and quota for commercial salmon trolling in the KMZ, coupled with the prohibitive distance of the MPA from Crescent City Harbor, do not make the candidate SMCA important for today's commercial or recreational salmon fleets. As such, significant impacts to the local salmon fleets cannot be anticipated at this point in time.

***Point St. George Offshore SMCA.*** The Point Saint George Offshore SMCA is located approximately 12 nautical miles northwest of Crescent City Harbor. The SMCA encompasses an area of nearly 9.5 square miles and includes waters from 176 to 399 feet in depth. The area is characterized by soft bottom substrate (sand and mud), with more limited hard bottom and rocky reef habitat. Notably, rocky reefs are attractive to various fish species and the soft substrate enables easy trawling and setting of crab pots. However, the offshore location of the SMCA and adjacent environs is disadvantageous to fishermen in that localized currents and winds are generally stronger than those typically found along the immediate coastline.

Commercial fleets known to use the area in and around the candidate Point St. George Offshore SMCA include: salmon trollers, crabbers, pink shrimp and groundfish trawlers, and rockfish and cod hook-and-line fishermen. The fleets most likely to be affected by reserve status are the groundfish and pink shrimp trawl fleets, as both the commercial and recreational take of salmon and Dungeness crab will be permitted.

Potential effects of the SMCA to the groundfish trawl fishery are reportedly overshadowed by regulations currently being implemented as part of an Individual Fishing Quota (IFQ) program. Under the parameters of the program, quotas on protected fish species would effectively result in a significant decrease in available inshore grounds irrespective of closures associated with the SMCA or other new MPAs.

Effects of the Point St. George Offshore SMCA on the pink shrimp trawl fishery would reportedly be minimal, given extensive alternative pink shrimp trawl grounds and the small size of the fleet (~12) and hence limited competition for use of those alternative grounds. Vessel operators reportedly would likely respond to the closure by trawling the boundaries of the SMCA *should* pink shrimp appear in the general area. Notably, handling trawl gear can be difficult, particularly in high winds and rough sea conditions, and thus some fishermen believe a buffer zone might be needed to prevent vessels and gear from drifting over reserve boundaries.

The Point St. George area has been important for rockfish and lingcod hook-and-line commercial fisheries in years past. Both permitted and open access fishermen harvested here. But limited quotas and current depth restrictions associated with the RCAs have significantly limited the economic viability of the area. Fleet size has decreased accordingly to 13 permitted fishermen. However, key discussants believe that new regulations associated with SMCA status would

impact the future potential of this historically important fishery if and when RCA limitations are lifted.

Recreational rockfish anglers and charter businesses have also periodically fished in and around the candidate SMCA. As with the case of the commercial rockfish fishery, establishment of RCAs have precluded the use of this area since the year 2000. Given that extensive rockfish grounds are available in other areas closer to shore, and given historic recreational preferences for salmon fishing, the future potential effects of closure would not likely be highly significant.

### **Anticipated Effects of Candidate MPAs in Humboldt County**

***Reading Rock SMCA and SMR.*** The proposed Reading Rock MPAs are located approximately 25 nautical miles south of Crescent City and about 16 nautical miles north of Trinidad. As such, the area lies beyond what is considered the standard ten-mile safe harbor zone for both Crescent City and Trinidad. The mouth of Redwood Creek is immediately south of the MPA boundary. The small community of Orick is situated approximately two miles south. The adjacent land areas are Redwood National and State Park lands. Road access to this area is limited.

The proposed Reading Rock SMCA encompasses approximately 12 square miles of ocean, with a shoreline span of 2.9 miles and offshore depths up to 165 feet. The bottom is comprised of sand and mud substrate with some offshore rocks. The Reading Rock SMR encompasses approximately 9.5 square miles of ocean, with depths ranging from 147 to 253 feet. Habitats include both soft and hard bottom, with the former predominating.

User groups potentially affected by the Reading Rock SMCA include: commercial, recreational and charter rockfish fleets from Trinidad, and participants in the recreational and commercial hook-and-line red tail perch fishery. Some 20 fishermen from Orick, Trinidad, and Eureka participate in the shore-based commercial perch fishery, typically earning around \$5,000 each year. Many also participate in the winter crab fishery. Red tail perch is sold to a Eureka-based buyer. The prospective SMCA designation is likely to displace shoreline effort immediately north and south of the closed areas. As is the case for the shore-based smelt fishery, limited vehicular beach access has constrained participation in the fishery. The combination of restricted beach access and displacement to adjacent areas has the potential to exacerbate crowding despite the limited number of participants.

Groups potentially affected by the candidate Reading Rock SMR include: the groundfish and pink shrimp trawl fleets; the large vessel commercial crab fleets from Crescent City, Trinidad, and Eureka; and commercial, recreational, and charter rockfish fleets from Trinidad. The principal effect on the commercial, recreational, and charter fleets would be loss of black rockfish grounds. However, it is anticipated that these effects would be minimal given: (1) considerable distances between the Reading Rock area and the ports of interest; (2) the availability of alternative grounds for the same rockfish species closer to the ports of interest; and (3) the fact that the RCAs have already limited rockfish fishing possibilities in the ocean areas adjacent to the candidate SMR.

For charter operators, the distance to viable grounds around Reading Rock translates into added fuel costs and transit time. Some charter operators generally ceased operating in the vicinity following establishment of the 20-fathom RCA. Fishing grounds closer to port allows operators to offer two half-day trips, reportedly a more lucrative arrangement than single full-day trips. One charter operator reported that the Reading Rock area provided for uncrowded fishing and that this opportunity would be missed by some of his patrons. Charter operators report that closure of this area will likely result in displacement of the remaining commercial, recreational, and charter fishing activity to available grounds in the Trinidad area.

Given an abundance of groundfish and the relative calm of inshore areas, the Reading Rock area has long been of interest to trawl captains. As is the case with the candidate SMCA at Point St. George, impacts to the groundfish and pink shrimp trawl fleets will likely be minimal in the current context of other pending regulations, the extensive nature of alternative grounds, and the small number of fishermen using those grounds (~12).

Reading Rock is generally considered a good area for pursuing Dungeness crab and at least 15 vessels from Crescent City, Eureka, and Trinidad regularly crab there. One respondent estimated that several thousand pots could potentially be set in the general area. Closures would reportedly result in displacement of effort to adjacent ocean areas with similarly favorable habitat. Due to the shape of the proposed reserve, displaced crabbers would likely set their pots along an east-west trajectory in immediately adjacent areas. Under this scenario, predominate current patterns have the potential to increase the rate of gear entanglement. Buoy lines with longer scope would be required, adding some cost to the fishery. Some captains state they would seek to avoid having their pots drift into the MPA by setting pots some distance away.

RCA regulations currently preclude rockfish fishing in the candidate Reading Rock SMR and adjacent areas. Respondents say that if the RCAs were ever lifted, the reserve designation would preclude the future potential of this historically important fishery.

***Samoa SMCA.*** The proposed Samoa SMCA is approximately ten nautical miles south of Trinidad and eight nautical miles north of the entrance to Humboldt Bay. The area encompasses nearly 13 square miles, a shoreline span of 3.6 miles, and depths up to 158 feet. The area is characterized by particularly sandy soft substrate. Shoreline access to the SMCA requires hiking in on the beach, though persons with commercial smelt licenses may use vehicles.

The area in and around the candidate SMCA is used extensively by commercial crabbers from Trinidad and Eureka. The area is also within range of larger vessels home ported in Crescent City and Fort Bragg. In contrast to similar areas south of the entrance to Humboldt Bay, this area is considered ideal for setting crab pots given the nature of the substrate and minimal currents.

The area in and around Samoa SMCA is also utilized by commercial, recreational, and charter fishermen targeting salmon, especially during mid-season when the fish generally move to inshore areas. Historically the area has also been used for commercial and recreational pursuit of smelt. Because the proposed SMCA would allow crabbing and salmon fishing (by troll) to continue, there would be little effect on the user groups.

The SMCA designation does have the potential to affect commercial and recreational red tail perch fishermen and recreational salmon moochers. “Mooching” is a hook-and-line drift fishing method often used late in the season for catching salmon.

Closure of the red tail perch fishery would likely result in displacement of fishing activity to the immediate north and south of the SMCA. The commercial red tail perch fishery tends to require use of vehicles to access the fishing area, and such access is limited. Potential closure of an important beach access site south of the entrance to Humboldt Bay has the potential to exacerbate crowding. Shoreline fishermen may experience some confusion regarding SMCA boundaries since: (1) such persons generally do not use GPS, and (2) because the homogenous nature of the Samoa area coastline does not provide clear landmarks by which to locate offshore boundaries.

Salmon moochers will likely be displaced outside the SMCA. This is likely to generate minimal impact given the extensive nature of alternative grounds.

***South Humboldt Bay SMRMA.*** This candidate SMRMA is located in south Humboldt Bay adjacent to the South Jetty Road. There are relatively few points of access here and the surrounding area is minimally populated. The SMRMA encompasses approximately 0.8 square mile and includes coastal marsh and eel grass habitat, which provides important habitat for eels and sharks and serves as a nursery area for various marine and estuarine species.

Historically important commercial fisheries in the bay have included California halibut, shark, and lampara and purse seine fisheries for sardine, anchovies, and herring. Currently, the commercial fishery is primarily limited to anchovies and herring. However, in recent years herring have not been abundant enough to support a commercial fishery. Recreational fishermen primarily target clams, Chinook salmon, California halibut, leopard sharks, bat rays, surfperch, rockfish, lingcod, greenling and cabezon.

Farmed oysters and clams are a particularly important product of Humboldt Bay, and there is a long history of disease-free mariculture activity here. Five firms currently hold mariculture leases. Oyster and clam spat are currently sold to growers in the United States, Canada, Mexico and Europe. Some 60 West Coast businesses receive spat from Humboldt Bay growers. The overall outlook for mariculture in the bay is reportedly good as there is stable demand. Some 400 acres are currently farmed and as much as 2,600 acres of the bay could feasibly be cultivated (Carter-Griffen 2010).

Commercial herring fishing is an important Humboldt Bay fishery, though productivity has been relatively low in recent years. Most herring is exported to Japan. The four permit holders are based in Eureka.

An anchovy bait fishery is conducted with lampara nets in the bay. One resident commercial fisherman sells live catch to commercial and recreational tuna fishermen, and numerous tuna fishermen net their own bait in the bay. This opportunity is important given a paucity of live bait sellers in the larger region.

None of the above user groups have been identified as likely to be impacted by the candidate Samoa SMRMA. Recreational uses such as those associated with pursuit of rockfish, Chinook salmon, lingcod, sharks, rays, and clams occur mainly outside of the proposed SMRMA. Some concern has been expressed about the potential difficulty users might experience in identifying boundary lines, due to a lack of clearly distinguishable landmarks in the area. However, the Humboldt Bay Harbor, Recreation and Conservation District has offered to establish and maintain landmarks for the SMCA.

***South Cape Mendocino, Mattole Canyon, and Sea Lion Gulch SMRs.*** We group discussion of the SMRs in this region. The sites are in fairly close proximity, and each candidate MPA is similar in terms of the human and physical geography of the adjacent land areas, and as regards local oceanographic and climatic conditions.

South Cape Mendocino SMR is approximately 27 nautical miles south of Eureka and 30 nautical miles north of the Shelter Cove. Sea Lion Gulch SMR is approximately 18 nautical miles north of Shelter Cove. Mattole Canyon SMR lies between its sister SMRs just north of Punta Gorda and west of the community of Petrolia.

South Cape Mendocino SMR encompasses approximately nine square miles, with a shoreline span of 1.4 miles and depths up to 277 feet. The boundaries of the candidate MPA envelop soft and hard bottom substrate, offshore rocks, and rocky shorelines. Mattole Canyon SMR encompasses approximately 9.8 square miles and depths ranging from 82 to 1,646 feet. Soft and hard bottom substrate, offshore reefs, canyons, and upwelling zones characterize the area. Sea Lion Gulch SMR encompasses 10.4 square miles with a shore span of two miles and depths up to 375 feet. Habitats are similar to those described above: soft and hard bottom substrate, offshore reef structure, and rocky shorelines.

The region in question is sparsely populated and remote from significantly sized population centers. The road system is challenging and the ocean is not easily accessed. The coastal Mattole Road is immediately adjacent to the candidate South Cape Mendocino SMR and allows for some limited access to the SMR. Other points of access occur just north of Punta Gorda and Sea Lion Gulch SMR.

Most of the adjacent lands in the northern portion of the region are privately owned. Much of the land in the southern portion is the federally managed 68,000 acre King Range National Conservation Area (NCA). King Range NCA extends along 35 miles of coast between Mattole River and Sinkyone Wilderness State Park. The region is known as the Lost Coast.

Although upwelling associated with Mendocino and Mattole Canyons makes for abundant marine life, many small-boat captains are discouraged from making the trip to fish here given the considerable distances from both Shelter Cove and Eureka and frequently challenging local winds and currents. Captains of large or well-equipped vessels are more typically apt to use the area. Kayaks are occasionally launched from remote access points along the shoreline.

Occasional users of the South Cape Mendocino SMR include: boat-based recreational anglers; three Eureka-based charter operators; abalone gatherers/divers; and recreational kayak anglers and spear fishermen who target rockfish. South Cape Mendocino was formerly also the site of a

Eureka-based commercial hook-and-line rockfish fishery. Up to 20 recreational captains and three charter operators may fish for rockfish and Pacific halibut in the Mendocino area during fair weather conditions.

SMR-related effects on rockfish fishing around the South Cape Mendocino SMR will reportedly be minimal given extensive rockfish grounds in adjacent areas, more favorable wind and sea conditions in areas closer to port, and the prohibitive costs of regular travel to the areas in and around the candidate SMR.

Effects on recreational Pacific halibut fishing is uncertain given that the fishery has only just developed and grown in popularity following the recent statewide salmon closures. Independent boat anglers and charter operators targeting Pacific halibut report that the species is not yet well known in terms of distribution in the region. Boat based anglers who target rockfish and/or Pacific halibut will likely continue to concentrate on areas north of the SMR due to distance considerations and more favorable conditions closer to home. Charter operators with fast and efficient vessels will reportedly fish north and south of the SMR.

South Cape Mendocino is considered an advanced pinnacle dive site requiring ideal weather conditions. Access is by boat only. The offshore location is conducive to high visibility, but also entails exposure to dangerous currents and sharks. As such, diving in the area is infrequent and undertaken by skilled divers and mariners only. Moreover, alternative dive spots such as Blunts Reef are said to provide similar visibility and substrate. As such, restrictions associated with the candidate SMR are expected to generate negligible impacts to the region's extractive divers and related businesses.

The South Cape Mendocino area is locally well-known among abalone gathers and divers. Closure of grounds at the candidate SMR reportedly could constrain future potential growth of such activity, especially as internet sites have increased public awareness of abalone grounds along the North Coast. Small businesses in Petrolia and Fortuna known to provide abalone divers with specialized gear, food, fuel, and other goods and services could lose some revenue stream upon establishment of the reserve.

Kayak angling has become increasingly popular among visitors and residents of the Cape Mendocino area. The closure reportedly would displace kayakers and kayak anglers south to an area that is afforded leeward protection from wind and sea. No loss of business opportunity is anticipated to occur following the establishment of the reserve.

Cape Mendocino was historically used by the Eureka-based commercial rockfish fleet. Following the establishment of a limited entry program in the 1990s, between six and ten fishermen used the area on a regular basis. Ensuing NFMP quotas, increased fuel prices, and the loss of a live-fish market have led to diminished activity in the areas. In the event the live-fish market returns and/or quotas increase, closure of the area would constrain fishing effort that might otherwise have been undertaken by the commercial hook and line rockfish fleet.

Approximately five large-vessel commercial crabbers use the Mattole Canyon SMR. Although the area reportedly is not a critically important crabbing area for Eureka-based fishermen, weather permitting, it is sometimes used late in the season when market prices for crab are

increasing. Fort Bragg-based captains reportedly use the areas in and around the candidate Mattole and Sea Lion SMRs on an irregular basis, and usually only on the way home from early season crabbing in the Eureka area. The wide shelf outside of the candidate Mattole SMR allows some room for displacement. The overall impact of the closure is likely to be minimal given: availability of similarly productive grounds in the larger region; prohibitive distances from ports in the region; challenging wind and sea conditions in the area; and the relatively small number of captains who have historically frequented Mattole Canyon fishing grounds.

User groups potentially impacted by the candidate Sea Lion Gulch SMR include abalone divers who access the area by boat or on foot, and 30 to 40 avid recreational boat anglers and two charter business operators from Shelter Cove. The area in and around the candidate Sea Lion Gulch SMR provides opportunities for catching rockfish in the nearshore zone and Pacific halibut further offshore. Parts of the nearshore area are well-protected. Notably, the grounds are distant from ports in the area and generally can be accessed only in appropriate weather conditions or by captains with large or well-equipped vessels, good navigation skills, and a measure of fortitude. Thus, use of the area is naturally limited.

Charter operators do sometimes use the area around the proposed Sea Lion Gulch SMR to provide their patrons with uncrowded conditions. Particularly during the month of September, after the salmon season has ended and when the recreational rockfish season is limited to areas north of 40° 10' N, the Sea Lion Gulch area provides suitable grounds for both Pacific halibut and rockfish. A likely effect of the prospective closure would be displacement of captains that do periodically use Sea Lion Gulch area to an area known as Rogers Break. This spot is closer to port and provides leeward protection and opportunities for halibut and rockfish fishing. Given limited use of the candidate reserve area, and alternative grounds closer to port, projected effects of the SMR are minimal, though some seasonal crowding can be expected to occur at Rogers Break. Crowding may be exacerbated by recent RCA measures which reportedly have decreased the available rockfish zone in the general region by some 25 percent.

Given limited access and distance from port, impacts to abalone divers will reportedly be minimal. Punta Gorda, which lies north of the Sea Lion Gulch SMR, is generally considered to be a more preferable diving location.

**Big Flat SMCA.** The candidate Big Flat SMCA is approximately 10.5 nautical miles north of Shelter Cove. As with Sea Lion Gulch SMR, the adjacent land area is part of the King Range NCA. Big Flat SMCA encompasses approximately 11.5 square miles with a shoreline span of 2.5 miles and depths up to 1,110 feet. The area is characterized by soft bottom substrate, canyon (approximately 1.5 miles of the distal end of the Spanish Canyon), and rocky shoreline. Access by land is constrained by steep topography and lack of an improved road system.

The stretch of coast from Punta Gorda to Shelter Cove includes two deep water canyons known as Spanish and Delgada Canyons. The bottom contours here are very steep and depths of 70 fathoms are common within three miles of land. Big Flat SMCA is leeward of Cape Mendocino/Punta Gorda and is thereby relatively protected from north and northwest winds and swells. However, it is exposed to south and southwest winds and swells.

Historically, the Big Flat area was used primarily by commercial, recreational, and charter salmon trollers. The area is now within the KMZ, and commercial salmon trolling is no longer permitted. The sandy bottom shelves near the canyons attract commercial crabbers from Shelter Cove and Noyo Harbor. Crabbers generally access Big Flat during the early part of the crab season, between December and mid-to-late February. As the season progresses, the number of active crabbers declines. Big Flat is accessed almost exclusively by captains of mid- to large-sized vessels, and is generally considered a highly productive area by fishermen working from Noyo Harbor. However, Noyo Harbor-based fishermen emphasize that productive crabbing here often requires long trips to pull pots before the arrival of storms. Although the area is closer to Shelter Cove than to Noyo Harbor, small-vessel fishermen working from Shelter Cove are more likely to use productive areas closer to port. The proposed regulations for the Big Flat SMCA would permit commercial and recreational take of salmon and crab and thus no effects on these fisheries can be anticipated.

The Big Flat area is also known for its productive halibut grounds and is often used when weather and/or sea conditions do not permit travel further north. Shelter Cove-based charter captains and recreational fishermen who pursue Pacific halibut here would likely be affected by the new regulations, and some secondary effects can be expected among businesses that serve visiting anglers. The Pacific halibut fishery is a developing fishery and as such the extent of grounds and potential for growth are unclear. Pacific halibut fishermen are likely to respond to the prospective closure by shifting their attention to grounds further south. Some respondents believe many fishermen will attempt to fish near the SMCA boundaries and express concern about pressure on a resource that is not well-known.

The SMCA is used on an occasional basis by abalone divers. However, because the Big Flat area is hard to access and requires a considerable long voyage, key respondents believe that the effects of new restrictions will be minimal. Abalone is more commonly gathered to the south of the SMCA between Shubrick Rock and Horse Mountain.

### **Anticipated Effects of Candidate MPAs in Northern Mendocino County**

**Vizcaino SMCA.** This candidate MPA is situated some 20 nautical miles north of Noyo Harbor and 16 nautical miles south of Shelter Cove along a section of rugged coastline that is not readily accessible by vehicle. The proposed MPA encompasses some 18.5 square miles, a shoreline span of nearly five miles, and depths 391 feet. The shoreline habitat includes some 2.85 miles of sandy beach.

Vizcaino MPA is the second largest MPA in the study area, after Reading Rock SMR/SMCA. The area is characterized by soft sand bottom reaching from seven to fifty fathoms, with some hard bottom and rocky substrate in the nearshore area out to about seven fathoms. Lying inshore between Vizcaino and Noyo Canyons, and dominated by extensive sandy bottom, the area supports rich Dungeness crab habitat. The rocky inshore region, particularly that in the southern part of the MPA, provides habitat for various rockfish species.

Commercial fleets using the area historically have targeted rockfish, cabezon, greenling, lingcod crab, and salmon. Dungeness crab fishermen have generally worked the sandy bottom areas of the candidate reserve from five to seventy fathoms. Rockfish fishermen have tended to work the



nearshore and deeper nearshore areas, targeting blue, black, china, and vermilion rockfish and cabezon, greenling, and lingcod. Recreational fishermen have historically targeted abalone, rockfish, and Pacific halibut.

The neighboring ports of Shelter Cove, Fort Bragg, and Albion are considerable distances from Vizcaino SMCA. This tends to minimize usage by small vessel operators. For charter captains, distance from port translates into a decreased profit margin that is determined by the number of passengers traveling, the cost of fuel, and distance to and from the fishing grounds. In the current economic climate, charter operators are tending to seek out ways to minimize costs and thus many are fishing closer to port than in years past. As such, the areas in and around the proposed Vizcaino SMCA currently are not typically accessed for charter fishing. Moreover, given the considerable distance from adjacent ports and challenging access by road, shore-based recreational fishing, abalone diving, and spear fishing tend to be undertaken primarily by local fishermen only.

Regulatory changes in the rockfish fishery have had a pronounced effect on fleet size and intensity of effort over the past decade. Presently, less than five commercial fishermen actively pursue rockfish in the candidate SMCA area using traps or hook and line gear. Given increasingly stringent regulations, fishermen are tending to maximize profit potential by selling their catch for distribution in the Bay area live fish market.

Regulatory changes in the salmon fishery over the past twenty years have also diminished fishing effort in the area. Recent spatial and temporal closures have resulted in the gradual transition of the Noyo Harbor salmon fleet to a fleet focused primarily on crab. As such, the area in and around the candidate Vizcaino SMCA has come to support an increasing number of crab fishermen. Due to SMCA allowances for the commercial harvest of crab and salmon, these fisheries would not be affected by the new designation.

Noyo and Albion-based commercial hook and line rockfish fishermen are most likely to be affected by the candidate reserve. As noted above, the SMCA is accessed by a handful of commercial rockfish fishermen during reasonable weather conditions in summer and fall. Although any effects would likely be minimized by prohibitive distances from harbor and the fact that the candidate SMCA is located in a relatively exposed location, rockfish fishermen point out that the area does provide an alternative to the more frequently used rocky areas south of Noyo Harbor. At least one Noyo Harbor receiver and several seafood retail businesses located in the Bay Area could potentially be affected by loss of fishing activity in the area. A more likely scenario has commercial fishermen displaced south of the SMCA and north of the Skip Wollenberg/Ten Mile SMR, with increased effort in this region to compensate for the loss of seafood product from the Vizcaino SMCA.

Although commercial sea urchin divers may be impacted by the candidate SMCA, such impacts would be mitigated by the fact that the area is not heavily used given prohibitive distances from port and visibility problems in the area.

Similarly, recreational fishermen and shoreline gatherers could also be affected by the new designation. However, key discussants believe such effects would be mitigated by the fact that the Vizcaino area is not heavily used at present given its remote location and limited access.

Moreover, the increased number of great white shark sightings and incidents in this area have led many local residents to fish south of Ten Mile Beach.

***Skip Wollenberg/ Ten Mile SMR, SMCA and SMRMA.*** The northern boundary of the Skip Wollenberg/Ten Mile SMR and southern boundary of the SMCA are located approximately 11.5 and 8.5 nautical miles north of Noyo Harbor, respectively. Highway 1 is adjacent to the coastline, connecting Fort Bragg to the small communities of Newport and Kibesillah, which are immediately adjacent to the MPA complex.

The Skip Wollenberg/Ten Mile SMR encompasses nearly 12 square miles, with a small shoreline and maximum depths of 343 feet. Most of the shoreline is rocky, with high bluffs above. The Skip Wollenberg/Ten Mile Beach SMCA encompasses 3.5 square miles, a one-mile sandy shoreline, and nearshore depths reaching 288 feet. The area is situated at the northern edge of McKerricher State Park and abuts a small residential neighborhood.

Skip Wollenberg/Ten Mile SMRMA is an estuary that extends from the mouth of Ten Mile River inland to the west bank of the south fork of the Ten Mile River. The area encompasses 0.2 square miles of water and a shoreline span of 3.2 miles, 2.3 miles of which is coastal marsh.

The candidate MPA complex contains a diversity of habitats. The SMR and SMCA are largely comprised of soft bottom habitat favored by Dungeness crab. The SMR also contains substantial areas of hard bottom, offshore rocks, and extensive kelp forests that lend to rich rockfish, abalone, and urchin habitats. The estuary is home to a variety of birds, invertebrates, and fish. Historically, the Ten Mile River system has served as a nursery area for salmon and steelhead trout.

With its rich and varied habitat and short distance to Noyo Harbor, the waters in and around the proposed Skip Wollenberg/Ten Mile SMR and SMCA are of significance to fleets operating from Noyo Harbor. Commercial fleets accessing the candidate reserve and adjacent areas include those pursuing crab, salmon, sea urchin, and rockfish. Recreational pursuit of salmon, rockfish, surfperch, crab, and abalone also occurs here. Mussels are sometimes gathered along the beaches. The principal user groups of these candidate areas are: recreational and commercial crabbers, recreational and commercial rockfish fishermen, commercial urchin divers, and recreational abalone divers.

The proximity of Skip Wollenberg/Ten Mile Beach SMR and SMCA to Noyo Harbor, coupled with extensive soft bottom habitat lend to favorable conditions for Noyo's commercial and recreational crab fleets. Crab is harvested in waters from 30 to 50 fathoms in depth along the outer reaches of the SMR. The shelf here is of sufficient width to set numerous pots. Medium and large-sized commercial vessels tend to travel past the Ten Mile SMCA area and crab in more northerly locations that are deemed to be relatively more productive and involve less potential for conflict with recreational crabbers, who predominantly fish the Ten Mile SMCA area. Commercial crabbers using smaller vessels are able to work in tight inshore areas around the proposed reserves, such as those between exposed nearshore rocks and sea stacks, and in the Ten Mile SMCA area.

Charter boat captains tend to prefer areas close to port since they must carefully manage running time and fuel costs. Some charter operators and private vessel fishermen say the areas in and around SMCA are particularly important during the first several weeks of the crab opener. Captains and crew continue to fish in the area through mid-July, weather and sea conditions permitting. Some initiate combination crab/rockfish trips in the area when conditions warrant. When running combination trips, captains often set their crab gear on the sandy bottom off Ten Mile Beach, then pursue rockfish around Kibesillah Rock and the Newport area while the pots soak, retrieving them during the return trip to port. It is said that the Ten Mile SMR area is typically accessed for rockfish only on combination trips. For rockfish-only trips, waters closer to Noyo Harbor are preferred since fuel costs are thereby reduced.

Noyo-based commercial salmon fishermen have historically accessed areas in around the SMR and SMCA. The seasonal closures of 2008 and 2009, and the restricted 2010 season reportedly served to diminish the size of the fleets currently on hand to troll in and around the candidate reserve and surrounding areas.

Commercial rockfish fishermen and urchin divers readily access the rocky nearshore portions of the Skip Wollenberg/Ten Mile SMR. A variety of rockfish species are available here, including blue, black, and vermillion. China cod, lingcod, greenling, and cabezon are harvested with hook and line and trap in the area. Although the rockfish fleet that accesses this area is small, it is said to contribute significantly to the shoreside support sector and overall economy of the Noyo area. Moreover, it is said that fishing activity here assists in relieving pressure from other rockfish habitats.

Urchin divers also access the candidate reserve areas. Extensive kelp beds here are conducive to urchin growth, and the area is somewhat protected from northeast winds. However, the area is primarily accessed only in the late summer and fall months once visibility increases. As with the rockfish fishery, the area is thought to absorb fishing pressure from other areas.

The waters of the candidate Skip Wollenberg/Ten Mile SMR are important to certain boat-based and shore-based recreational anglers. The beaches south of Westport are well-known for surf-fishing, spear fishing, and abalone diving. A recent shark attack has led to diminished use of the area by divers. Because this area lies outside the normative ten-mile radius for safe travel, the number of vessel-based recreational fishermen accessing the areas is relatively small compared to areas further south. Many recreational fishermen keep in mind that the shoreline north of Noyo Harbor offers few safe areas in which to moor, should their vessels lose power or in they event they encounter deteriorating sea conditions.

Because the waters in and around the Skip Wollenberg/Ten Mile SMR are used fairly regularly, closure of the area would likely affect some fishermen. A portion of the commercial crab fleet, approximately five fishermen, operating from Noyo Harbor would be impacted, mostly likely resulting in displacement of fishing effort to areas north of the candidate Ten Mile SMR. It is unlikely that this group will work further south, since charter captains tend to “pick over” the area during the recreational Dungeness crab opener in late November.

At least four participants in the Noyo charter fleet would also likely be affected by the prospective closure. Captains who now use the area would likely fish in areas south of Ten Mile

beach. The result would likely be a higher concentration of fishermen working in relatively more confined areas in that region. In an industry already subject to a variety of restrictions, there is indication that this closure could pose some challenges to certain participants. One potential effect would involve the need to pursue alternative species, such as Pacific halibut. There is also some potential for loss of clientele, which could result in detrimental economic impact to shoreside businesses such as campgrounds, hotels, and restaurants.

Similarly, between three and five urchin divers would likely displace their efforts, seeking new locations and/or increasing the level of use of areas that are known to be productive during the summer and fall months. This secondary impact of increased effort in a confined area could be felt by no other 20 to 25 divers, though only during certain times of year. Some key respondents suggest that if no urchin harvest occurs in the Skip Wollenberg/Ten Mile SMRMA, then “urchin barrens” (areas dominated by sea urchins) could result, similar to what a number of fishermen report has occurred around the Point Cabrillo Reserve. An adaptive management program for sea urchins is being considered for the Skip Wollenberg/Ten Mile SMRMA.

Abalone divers / shore-gathers and finfish spear fishermen would likely be displaced south of the SMR, to Point Laguna and points south. Waters to the north have a bad reputation for sharks. Extensive effects on local businesses are not anticipated.

As indicated above, the primary users of the Skip Wollenberg/Ten Mile Beach SMCA are recreational and commercial crabbers, almost all of whom use traps. Given that such activity would be allowed to continue, no major direct effects on this group can be anticipated. However, because commercial crabbers displaced from the adjacent SMR could use this area with greater frequency, some crowding and increased localized pressure on the resource may result. Because many commercial crab fishermen perceive that the area in and around Ten Mile SMCA is already overcrowded, the probability of displacement is reduced.

The Ten Mile River area has never supported highly productive commercial or recreational fisheries. Approximately 2.30 square miles of the waterway is comprised of coastal marsh, with a bottom of silt and organic matter. The area is relatively shallow. The area is now often used by a small number of kayakers and recreational boaters. Bird watching is popular here.

The SMRMA cannot be anticipated to generate effects on user groups or shoreside service infrastructure. Long term effects could be beneficial for future salmon stocks.

***Point Cabrillo SMR.*** Point Cabrillo SMR is approximately five nautical miles south of the Noyo Harbor and eight nautical miles north of Albion Harbor. Point Cabrillo SMR is the smallest proposed MPA in the study area, encompassing only 0.44 square miles and a shoreline span of about one mile. Waters of the SMR reach a maximum depth of 40 feet. The area is characterized by a mix of rocky reef, soft mud or sand bottom, and extensive kelp beds. The rocky inshore region provides habitat to a number of rockfish species and urchins.

The principal fleets known to have used the area in the past include the commercial and recreational rockfish, urchin, and crab fleets, and recreational abalone divers. The use of waters offshore of Point Cabrillo was restricted upon establishment in 1975 of a state park underwater lease program designed to protect the *Frolic* shipwreck site. The designation restricted

extractive uses in the area. The Point Cabrillo SMR will extend the boundaries of the lease site. Given existing regulations regarding use of waters in the Point Cabrillo area, no significant impact on user groups or associated shore side infrastructure can be anticipated following establishment of the new SMR.

***Big River Estuary SMP.*** The Big River Estuary SMP is located within the Mendocino Woodlands State Park south of the City of Mendocino. Its seaward boundary is the east side of the Highway One bridge, and the inland boundary abuts that of the state park. From the late 1880s until 2002, when the state park was created, the Big River region was largely inaccessible since it was bordered by privately-owned timber lands. Since this time, there has been concerted effort to conserve the biodiversity of the river while permitting various recreational activities, including kayaking, canoeing, hiking, and fishing. As the Big River estuary lies within walking distance of Mendocino and within driving distance of Fort Bragg, the river has since served as an important leisure destination for locals and visitors alike.

The candidate Big River Estuary SMP encompasses 0.12 square miles of habitat, half of which is coastal marsh. Tidal flats and rocky shores also characterize this prospective MPA. The tidal-influenced river provides conducive habitat for over 20 species of fish, including surfperch, flatfish, surf smelt, salmon, and over 130 species of birds.

Recreational anglers are the principal user group, traditionally targeting surfperch from shore with hook and line, and Dungeness crab with hoop net. Given that the proposed SMP regulations would allow for the recreational take of surfperch by hook and line from shore, and Dungeness crab by hoop net and diving, no effects can be anticipated.

***Navarro River Estuary SMRMA.*** The candidate Navarro River Estuary SMRMA is located ten miles south of Mendocino between the mouth of the estuary to the west side of the Highway One bridge. The proposed reserve encompasses 0.06 square miles of habitat. The area is characterized by coastal marsh, tidal flats, and rocky shoreline, with a bottom comprised of gravel, rubble and sand. The marsh and mud flats provide habitat for a number of species. Up-river habitat is conducive to Chinook, coho, and steelhead, though numbers reportedly have declined in the past decades.

Upriver development, farming, and timber production in nearby Anderson Valley have resulted in diminished riverine water quality in the area. Runoff, erosion and the accumulation of sediment have contributed to the degradation of local habitat, which reportedly have affected salmon and steelhead populations. Use of the river is said to have declined in recent years, due in part to water quality issues. The Navarro River Redwoods State Park and Beach abuts the proposed SMRMA. A primitive campground is available for visitors who enjoy angling, though most visiting anglers fish from the ocean shoreline. River fishing, while popular around an upriver campground, is restricted in the summer months.

Historically, the primary users of the area around the Navarro River SMRMA have been small vessel sport and consumptive-oriented recreational anglers. The proposed reserve will not affect existing regulations and thus cannot be anticipated to affect the activities of these user groups.

**Special Closures.** In addition to the candidate MPAs, seven special closures have been proposed through the MLPA process. They are as follows: Southwest Seal Rock, Castle Rock and False Klamath Rock in Del Norte County; Sugarloaf Island and Steamboat Rock in Humboldt County; and Rockport Rocks and Vizcaino Rocks in Mendocino County. The purpose of special closures is to protect important marine mammal and bird rookeries. Year-round or seasonal exclusion zones of 300 feet are proposed around all or most sides the various sites. The largest closure, around Castle Rock, encompasses .05 square miles. Five of the proposed sites encompass .02 square miles. Allowances for traditional, non-commercial tribal uses have been proposed.

Due to the nature of the habitat being protected, persons targeting abalone, sea urchin, seaweed and rockfish in the proposed areas are potentially most affected. In so far as the special closures regulate transit, non-consumptive users are also potentially impacted.

Concerns have been expressed by kayak guides and surfers regarding restricted access to False Klamath Rock and Castle Rock. Other concerns regard perceived need for transit to retrieve lost fishing and crab gear, and to enable passage during hazardous weather and other emergencies. Generally speaking, however, the potential impact of the seven closures is mitigated given that: the proposed sites are small; seasonal allowances are often proposed for certain uses; most sites are significant distances from area ports; numerous sites are adjacent to areas with limited access; there is an existing pattern of avoidance by prospective user groups given the presence of marine mammals, and; the prevailing sea conditions in the areas of interest are typically dangerous.

## **5.5 Summary Characterization of Impacts**

This section briefly summarizes the potential effects of the candidate marine reserves and associated regulations as stipulated in the RNCP. Based on review and analysis of archival and primary source data collected during the course of the project, and especially data from follow-up interviews conducted with knowledgeable fishermen and public officials during the fall months of 2010, potential and anticipated effects resulting from establishment of MPAs can be broadly categorized into four types and levels of fisheries impacts. These are as follow:

- 1) *Moderate impacts* if: (a) the fleet using the candidate MPAs or adjacent areas is relatively large; (b) the new closures combined with existing regulations pose inordinate constraints on normal fishing activities ; and (c) particularly important resources or habitat characteristics are no longer available as a result of the new closures;
- 2) *Minimal impacts* where there are disincentives to use a candidate reserve area, such as: (a) the existence of alternative fishing grounds; (b) challenging weather or sea conditions in the area of interest; (c) prohibitive distances from port, with associated time and fuel costs; or (d) pre-existing or soon to be enacted regulations that also preclude use of the area in question;
- 3) *Potential future impacts* if the new regulations preclude development of new fisheries or revival of historic fisheries in the area of interest;

- 4) *Negligible impacts* due to minimal interest in or use of the area in question; in the case of shoreside sector impacts, this would involve availability of seafood products from other areas.

Tables 5-6 and 5-7 summarize the anticipated effects of the candidate MPAs based on these definitions and the preceding effects analysis. This summary information concludes the report.

**Table 5-6 Summary of Anticipated Effects on North Coast Commercial Fisheries**

MPA		Anticipated Harvest Sector Effects	Anticipated Shoreside Effects
Dungeness Crab	Pyramid Point SMCA	Potentially moderate impact due to increased crowding and gear conflict in areas south of SMCA	Negligible effect given competitive nature of crab market, demand for crab, and availability of resource elsewhere.
	Reading Rock SMR	Potentially moderate impact due to increased crowding and gear conflict; potential gear handling difficulties with resulting increased loss of workable space; increased time and costs associated with baiting	Bait companies could experience some increased demand as fishermen attempt to encourage crab out of closed areas.
	Mattole Canyon SMR	Likely minimal impact due to prohibitive local weather conditions, displacement possibilities, distance factors, and small size of user group	Negligible
	Skip Wollenberg/ Ten Mile SMR	Potentially moderate impact given possible displacement north of closure with increased crowding, gear conflict, and gear handling conflicts possible	Negligible effect given competitive nature of crab market, demand for crab, and availability of resource elsewhere.
Groundfish (Trawl)	Point Saint George Offshore SMCA	Minimal impact given concurrently established quota regulations	Negligible
	Reading Rock SMR		

Pink Shrimp (Trawl)	Point Saint George Offshore SMCA	Minimal impact given extensive adjacent grounds, and small fleet size	Negligible
	Reading Rock SMR		
Rockfish Complex and Lingcod (Hook-and-line and trap)	Point Saint George Offshore SMCA	Significant potential future impact if regulatory environment changes	Potential impact to local offloader and small buyers
	Reading Rock SMCA	Minimal current and minor future potential future if regulatory environment changes Encourages displacement to already crowded area	Negligible due to small number of permitted fishermen
	Reading Rock SMR	Minimal current and minor future potential impact (if regulatory environment changes) Due to distance from harbor Encourages displacement to already crowded area	Negligible due to small number of permitted fishermen
	South Cape Mendocino SMR	Potential future impact if market and/or regulatory changes occur	Potential impact to local offloader and small buyers
	Vizcaino SMCA	Minimal impact due to distance of port Likely displacement south and possible displacement to other species	Potential impact on local specialized offloader
	Skip Wollenberg/ Ten Mile SMR	Moderate (cumulative) impact due to proximity to port; Likely displacement to areas south of area and likely displacement to other species	Potential impact on local specialized offloader
Red tail Perch (Shore-based hook-and-line)	Reading Rock SMCA	Minimal impact Potential shift of effort north and south possibly complicated by limited vehicle access	Negligible
	Samoa SMCA	Minimal impact Displacement with possible increased crowding Confusion over boundary locations	Negligible
Salmon (Troll)	Pyramid Point SMCA	Minimal current impact due to longstanding and current KMZ regulations	None
	South Cape Mendocino SMR	Minimal current impact due to longstanding and current KMZ regulations	None
	Mattole SMR	Minimal current impact due to longstanding and current KMZ regulations	None
	Sea Lion Gulch SMR	Minimal current impact due to longstanding and current KMZ regulations	None
	Skip Wollenberg/ Ten Mile SMR	Potential minor impact to return fishery mitigated by extensive adjacent grounds	Negligible
Sea Urchin (Dive)	Vizcaino SMCA	Minimal impact to due to distance from port and visibility issues	Negligible
	Skip Wollenberg/ Ten Mile SMR	Moderate (cumulative) impact due to loss of area with good visibility and other MPA closures in North Central Coast region Displacement north and south to remaining grounds with consequent concentration of effort	Negligible immediate impacts  Potential long term (cumulative) impact to two shore side processors due to loss of product



**Table 5-7 Summary of Anticipated Effects on North Coast Recreational Fisheries**

	<b>MPA</b>	<b>Anticipated Harvest Sector Effects</b>	<b>Anticipated Shoreside Effects</b>
Rockfish, Cabezon, Greenling complex and Lingcod (Hook-and-Line)	Point Saint George Offshore SMCA	Minor potential future impact if regulations change	Negligible
	Reading Rock SMCA	Minimal current impact due to distance from ports/harbor Encourages displacement to already crowded area Minor potential future impact if regulatory environment changes	Negligible
	Reading Rock SMR	Minimal current impact due to distance from ports/harbor Encourages displacement to already crowded area Minor potential future impact if regulatory environment changes	Negligible
	South Cape Mendocino SMR	Minimal impact due to extensive rockfish grounds in vicinity, more favorable weather related conditions in closer grounds, and distance from port. Displacement north likely for recreational anglers and north and south for charter operators with fast vessels.	Negligible
	Sea Lion Gulch SMR	Minimal impact due to distance and prevailing weather conditions Displacement south with resulting concentration of effort	Negligible
	Vizcaino SMCA	Minimal impact due to distance from port Displacement south of Ten Mile with resulting concentration of effort	Negligible
	Skip Wollenberg/ Ten Mile SMR	Moderate (cumulative) impact for charter operations Displacement south with resulting concentration of effort and possible displacement of effort to other, new fisheries (e.g. Humboldt squid and/or Pacific halibut). Minimal impact to boat-based recreational anglers Due to distance from port	Long term potential loss of revenue to shore side hotels, campgrounds, and vacation rental properties
Pacific Halibut	South Cape Mendocino SMR	Long term impact to developing fishery unknown	Negligible
	Sea Lion Gulch SMR	Impact to developing fishery Impact mitigated by distance and weather conditions especially for recreational anglers. Potentially significant for charter operators due to confluence of regulatory factors and demand for multispecies trips.	Potential loss of future revenue to local businesses that serve the remote area
	Big Flat SMCA	Potential impact to developing fishery	Likely loss of future potential revenue to local businesses that serve the remote area

Recreational Surf Perch (and other shore-based hook-and-line fisheries)	Reading Rock SMCA	Minimal impact due to distance from port and alternative grounds Potential displacement north and south	Negligible
	Samoa SMCA	Minimal impact due to distance from port and alternative grounds Potential displacement north and south Potential confusion about boundaries	Negligible
	Skip Wollenberg/ Ten Mile SMR	Minimal impact given limited use Potential displacement to areas south of Ten Mile River	Negligible
Salmon (troll and/or mooch)	Pyramid Point SMCA	Minimal impact due to distance from port, extent of other grounds, and current regulations	Negligible
	Samoa SMCA (mooching)	Minimal impact due to extent of other grounds	Negligible
	South Cape Mendocino SMR	Minimal impact Due to distance from port, extensiveness of other grounds, and current regulations	Negligible
	Sea Lion Gulch SMR	Minimal impact Due to distance from port, extensiveness of other grounds, and current regulations	Negligible
	Skip Wollenberg/ Ten Mile SMR	Minimal current and future potential impact	Negligible
Abalone (dive and/or shore picking)	South Cape Mendocino SMR	Minimal current impact Unknown impact to future potential growth	Likely loss of future potential revenue to local businesses that serve the remote area
	Sea Lion Gulch SMR	Minimal impact due to distance from ports, access difficulties, and other preferred areas of use	Negligible
	Big Flat SMCA	Minimal impact due to distance from ports, access difficulties, and other preferred areas of use	Negligible
	Vizcaino SMCA	Minimal impact due to distance from port, access difficulties, and reputation for sharks	Negligible
	Skip Wollenberg/ Ten Mile SMR	Minimal impact due to presence of other abalone grounds Likely displacement to the south	Negligible
Finfish (spear fishing)	South Cape Mendocino SMR	Minimal impact Possible displacement to the immediate north	Negligible
	Vizcaino SMCA	Minimal impact due to distance from port, access difficulties, sharks	Negligible
	Skip Wollenberg/ Ten Mile SMR	Minimal impact Possible displacement to areas south	Negligible
Dungeness Crab	Skip Wollenberg/ Ten Mile SMR	Minimal impact due to distance from port and availability of other grounds	Negligible
	Skip Wollenberg/ Ten Mile SMCA	Minimal impact Possible displacement of crabbers from SMR	Negligible

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## **Appendix A**

### **Ranges of Fleets vis-à-vis the Candidate MPAs**

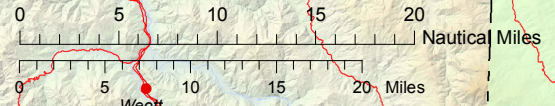
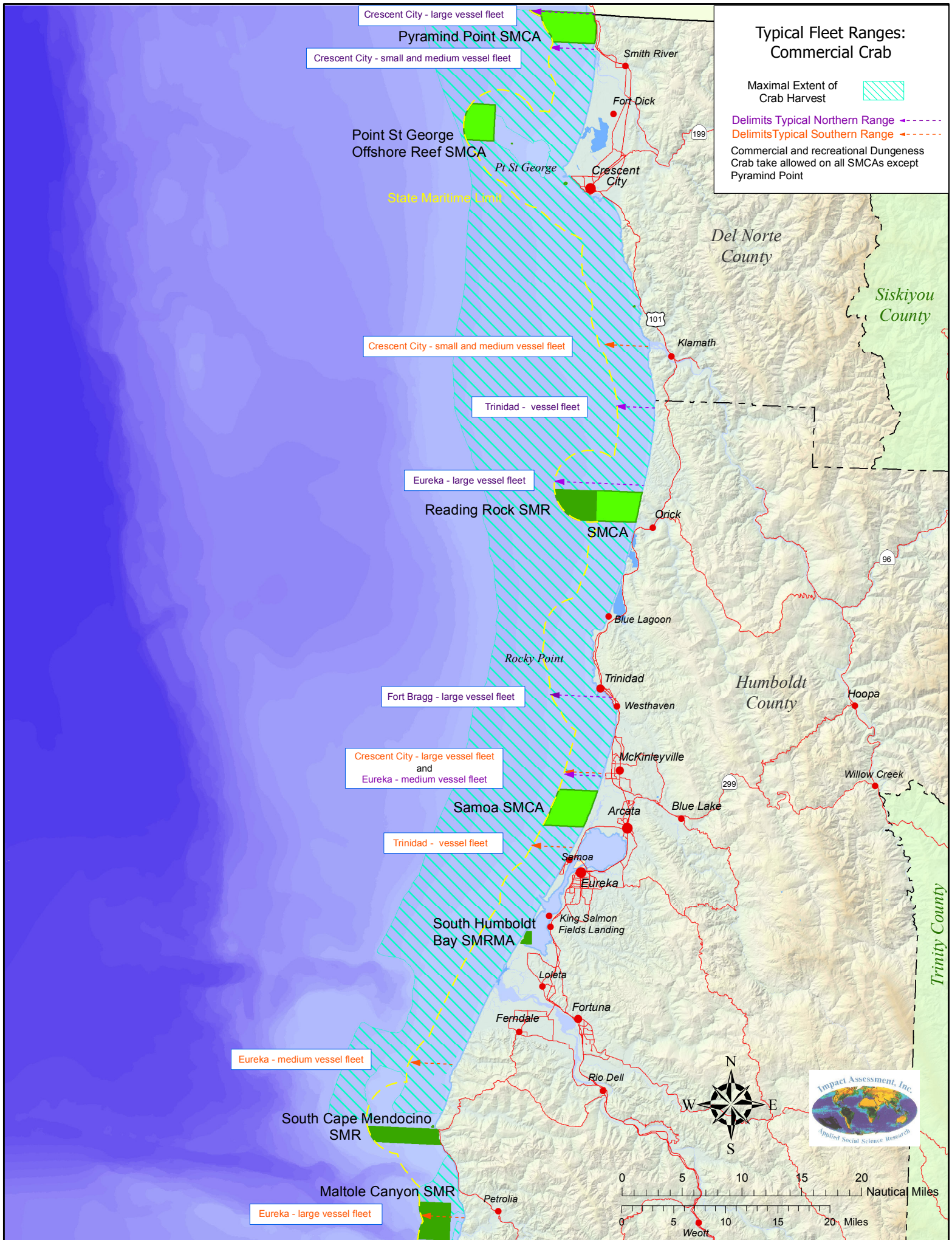
### Typical Fleet Ranges: Commercial Crab

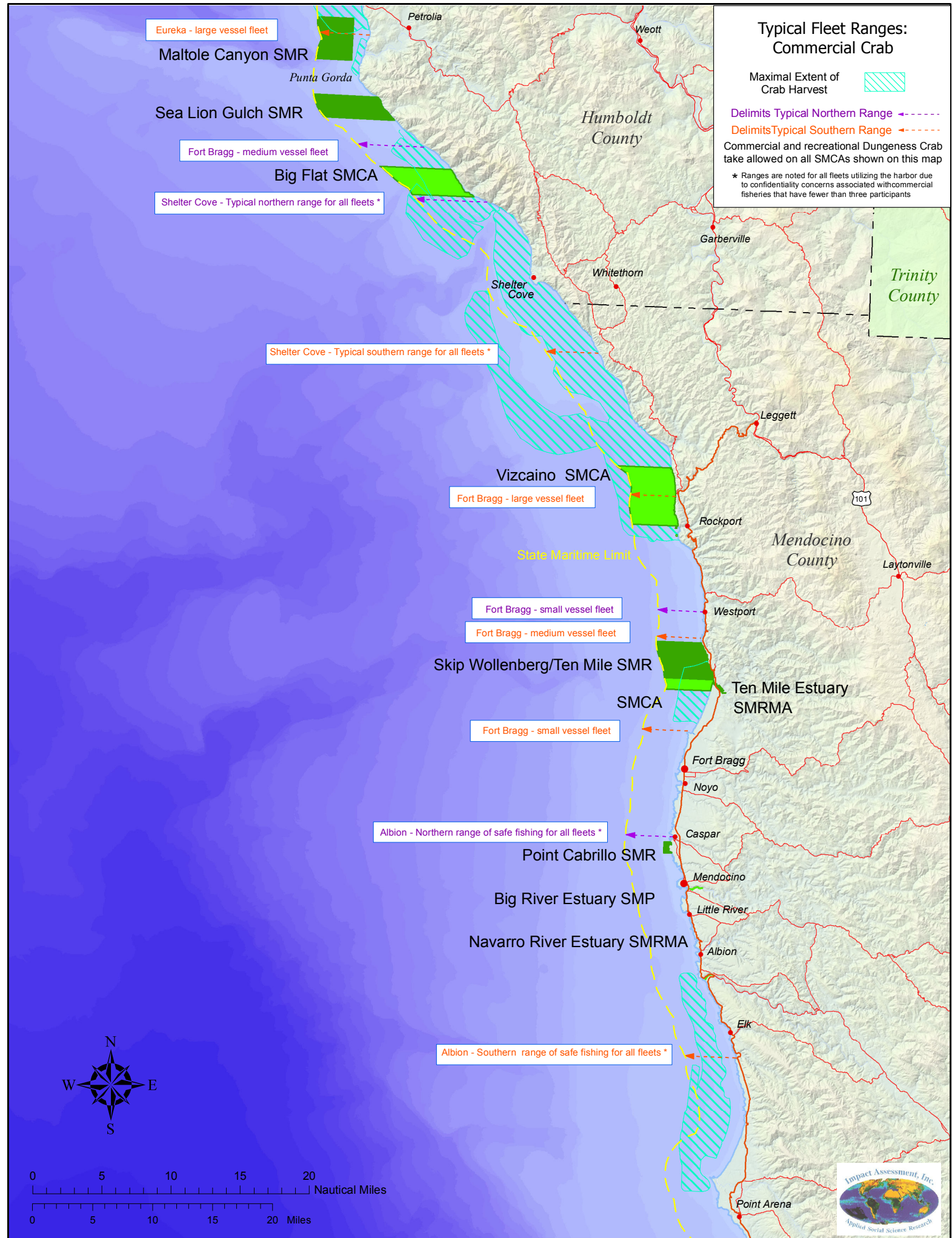
Maximal Extent of  
Crab Harvest 

Delimits Typical Northern Range 





Delimits Typical Southern Range 

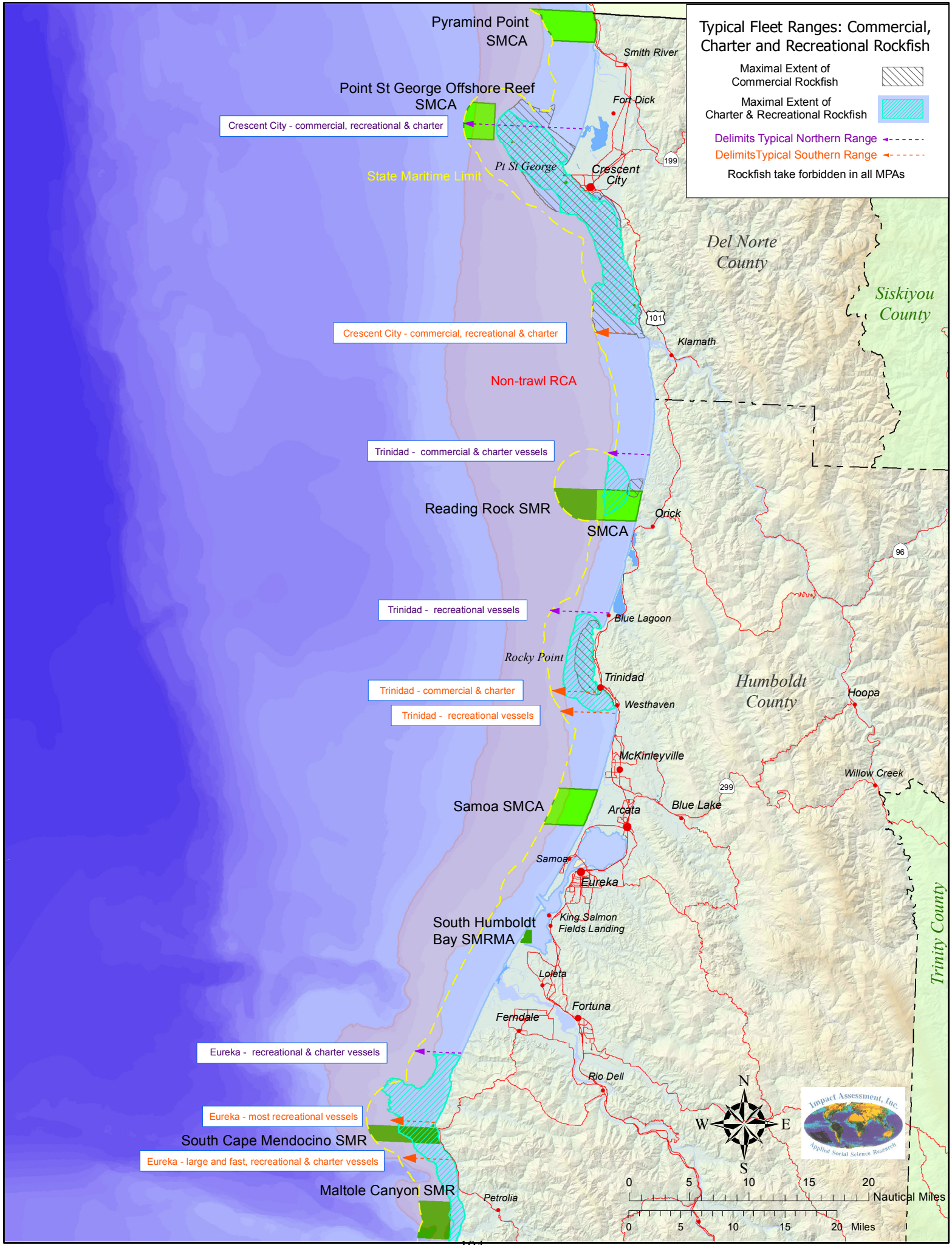
Commercial and recreational Dungeness  
Crab take allowed on all SMCAs except  
Pyramid Point





**Typical Fleet Ranges: Commercial, Charter and Recreational Rockfish**

- Maximal Extent of Commercial Rockfish 
- Maximal Extent of Charter & Recreational Rockfish 
- Delimits Typical Northern Range 
- Delimits Typical Southern Range 
- Rockfish take forbidden in all MPAs



Crescent City - commercial, recreational & charter

Crescent City - commercial, recreational & charter

Trinidad - commercial & charter vessels

Trinidad - recreational vessels

Trinidad - commercial & charter

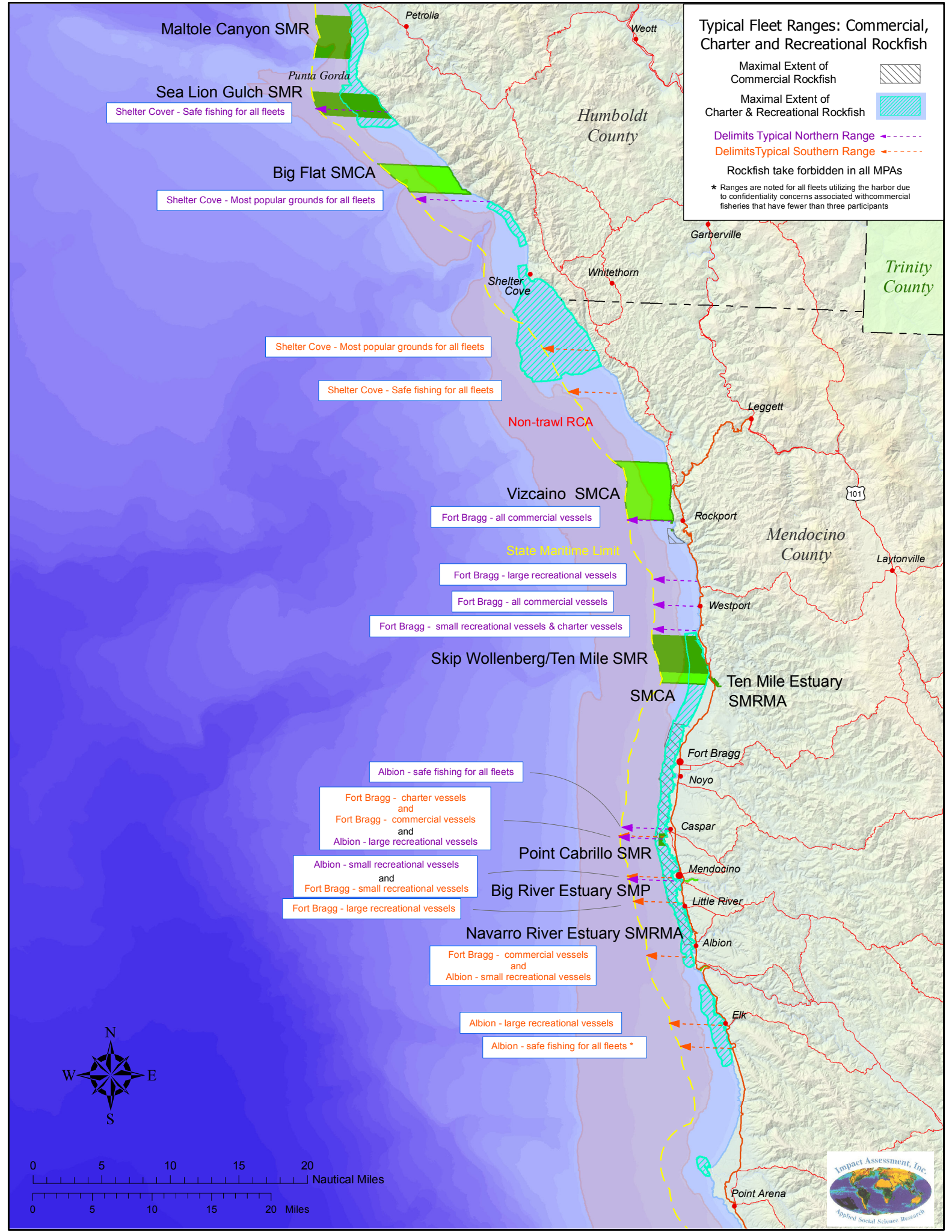
Trinidad - recreational vessels

Eureka - recreational & charter vessels


Eureka - most recreational vessels


Eureka - large and fast, recreational & charter vessels







**Typical Fleet Ranges: Commercial, Charter and Recreational Rockfish**

Maximal Extent of Commercial Rockfish 

Maximal Extent of Charter & Recreational Rockfish 

Delimits Typical Northern Range 

Delimits Typical Southern Range 

Rockfish take forbidden in all MPAs

\* Ranges are noted for all fleets utilizing the harbor due to confidentiality concerns associated with commercial fisheries that have fewer than three participants

Shelter Cove - Safe fishing for all fleets

Shelter Cove - Most popular grounds for all fleets

Shelter Cove - Most popular grounds for all fleets

Shelter Cove - Safe fishing for all fleets

Fort Bragg - all commercial vessels

Fort Bragg - large recreational vessels

Fort Bragg - all commercial vessels

Fort Bragg - small recreational vessels & charter vessels

Albion - safe fishing for all fleets

Fort Bragg - charter vessels and  
Fort Bragg - commercial vessels and  
Albion - large recreational vessels

Albion - small recreational vessels and  
Fort Bragg - small recreational vessels

Fort Bragg - large recreational vessels

Fort Bragg - commercial vessels and  
Albion - small recreational vessels

Albion - large recreational vessels

Albion - safe fishing for all fleets \*

