

**California Marine Life Protection Act Initiative**  
**Preliminary Evaluation of Existing State Marine Protected Areas in the**  
**MLPA North Central Coast Study Region**  
*Revised September 24, 2007*

## **1.0 Introduction**

The existing marine protected areas (MPAs) in the MLPA North Central Coast Study Region have been preliminarily evaluated by MLPA staff using the same framework that was used for the central coast MLPA process, with the addition of an assessment relative to California Department of Fish and Game (DFG) feasibility criteria. This preliminary evaluation will be reviewed and refined by the MLPA Master Plan Science Advisory Team (SAT) and will provide a framework for the evaluation of alternative MPA proposals for the study region. The existing state MPAs in the north central coast represent the “no action alternative” in this portion of the MLPA planning process, and constitute a baseline package of MPAs to which future packages developed through the MLPA process can be compared.

During the Marine Life Protection Act (MLPA) Initiative’s Central Coast Project, the SAT and MLPA staff developed a process for evaluating proposed MPA packages against the scientific guidelines outlined in the *California Marine Life Protection Act Draft Master Plan for Marine Protected Areas* (CDFG 2006), which are based on the goals of the MLPA. For the purposes of the MLPA Central Coast Project evaluation, the MLPA goals were divided into four groups:

- Goals pertaining to protection of habitats (MLPA goals 1 and 4)
- Goals pertaining to connectivity among MPAs in a network (MLPA goals 2 and 6)
- Goals pertaining to recreational, educational, and study opportunities provided by MPAs, including replication of MPAs (MLPA goal 3)
- Goals not requiring scientific evaluation (MLPA goal 5)

A preliminary evaluation of all existing state MPAs in California, including the thirteen MPAs in the MLPA North Central Coast Study Region, was conducted by DFG in 2004. The 2004 document is not current and has some errors, but provides some background information on the existing MPAs. A portion of that DFG statewide evaluation that focused on the 13 MPAs in this study region is provided in Appendix A, and includes the date each MPA was established, and the primary objectives and a basic evaluation for each MPA.

A map showing the 13 existing north central coast MPAs in the study region is included as Appendix B. Maps of each existing state MPA in the study region are included as Appendix C.

## 2.0 Key Characteristics of Existing MPAs

Key characteristics of existing state MPAs in the study region, including area covered, alongshore span, depth range, and habitats represented are summarized in tables 1, 2, and 3.

**Table 1. Overall Summary for Existing State MPAs in the MLPA North Central Coast Study Region**

Type of MPA	# of MPAs	Area (mi <sup>2</sup> )	% of Study Region
State Marine Reserve (SMR)	1	0.28 mi <sup>2</sup>	0.04%
State Marine Park (SMP)	3	1.49 mi <sup>2</sup>	0.19%
State Marine Conservation Area (SMCA)	9	25.12 mi <sup>2</sup>	3.29%
All MPAs combined	13	26.88 mi <sup>2</sup>	3.52%

**Table 2. Existing State MPAs in the MLPA North Central Coast Study Region (from North to South)**

MPA Name	Size (mi <sup>2</sup> )	Along-shore Span (mi) <sup>A</sup>	Depth Range (ft)
Manchester and Arena Rock SMCA	6.68 mi <sup>2</sup>	3.0 mi	0-141 ft
Del Mar Landing SMP	0.09 mi <sup>2</sup>	0.3 mi	0-55 ft
Salt Point SMCA	1.63 mi <sup>2</sup>	2.2 mi	0-182 ft
Gerstle Cove SMCA	0.01 mi <sup>2</sup>	0.1 mi	0-42 ft
Fort Ross SMCA	0.11 mi <sup>2</sup>	0.9 mi	0-32 ft
Sonoma Coast SMCA	0.89 mi <sup>2</sup>	3.3 mi	0-14 ft
Bodega SMR	0.28 mi <sup>2</sup>	1.1 mi	0-30 ft
Tomales Bay SMP	0.63 mi <sup>2</sup>	1.2 mi	0-3 ft
Point Reyes Headlands SMCA	0.79 mi <sup>2</sup>	3.1 mi	0-80 ft
Estero de Limantour SMCA	0.86 mi <sup>2</sup>	3.1 mi	0-3 ft
Duxbury Reef SMCA	0.66 mi <sup>2</sup>	3.0 mi	0-6 ft
James V. Fitzgerald SMP	0.76 mi <sup>2</sup>	3.4 mi	0-31 ft
Farallon Islands SMCA <sup>B</sup>	13.51 mi <sup>2</sup>	5.1 mi	0-244 ft

A. Alongshore span measured as direct line from one end of the MPA to the other

B. Most of this area has no additional restrictions on take beyond normal fishing regulations. Small nearshore portions of the MPA are closed to vessel access during specific seasons.

**Table 3. Habitat Representation in Existing State MPAs in the MLPA North Central Coast Study Region**

Habitat Type	Percentage of habitat area in the study region within existing MPA designations <sup>1</sup>				Data Source
	SMR	SMP	SMCA	Total, all MPAs	
Intertidal					
Sandy or gravel beaches	0.12%	1.44%	8.38%	9.93%	NOAA-ESI 2002
Rocky intertidal and cliff	0.89%	2.46%	12.82%	16.17%	NOAA-ESI 2002
Coastal marsh	0.00%	11.82%	10.99%	22.81%	NOAA-ESI 2002
Tidal flats	0.00%	4.56%	12.71%	17.27%	NOAA-ESI 2002
Seagrass beds (0-30m): Surfgrass	1.80%	5.46%	14.83%	22.09%	Tenera/Minerals Management Service
Seagrass beds (0-30m): Eelgrass	0.00%	0.00%	12.70%	12.70%	Morro Bay National Estuary Program; Elkhorn Slough Foundation; CDFG Tomales Bay data; Humboldt GIS Atlas
Estuary	0.00%	3.24%	3.88%	7.12%	National Wetlands Inventory; California Natural Diversity Database; NOAA-ESI 2002; USGS Topos
Soft bottom					
0-30 meters	0.00%	0.28%	3.71%	3.99%	Kvitek et al 2007; Greene et al 2004
30-100 meters	0.00%	0.00%	0.86%	0.86%	Kvitek et al 2007; Greene et al 2004
100-200 meters	0.00%	0.00%	0.00%	0.00%	Kvitek et al 2007; Greene et al 2004
>200 meters	NP	NP	NP	NP	Kvitek et al 2007; Greene et al 2004
Hard bottom					
0-30 meters	0.00%	0.00%	9.95%	9.95%	Kvitek et al 2007; Greene et al 2004
30-100 meters	0.00%	0.00%	9.13%	9.13%	Kvitek et al 2007; Greene et al 2004
100-200m	NP	NP	NP	NP	Kvitek et al 2007;

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<b>Habitat Type</b>	<b>Percentage of habitat area in the study region within existing MPA designations <sup>1</sup></b>				<b>Data Source</b>
	<b>SMR</b>	<b>SMP</b>	<b>SMCA</b>	<b>Total, all MPAs</b>	
					Greene et al 2004
>200 meters	NP	NP	NP	NP	Kvitek et al 2007; Greene et al 2004
Unknown					
0- 30 meters	0.00%	0.68%	6.00%	6.68%	
30- 100 meters	0.00%	0.00%	0.00%	0.00%	
100- 200 meters	0.00%	0.00%	0.00%	0.00%	
>200 meters	0.00%	0.00%	0.00%	0.00%	
Kelp forest					
Average kelp ('89, '99, '02, '03)	0.00%	0.08%	5.28%	5.36%	CDFG 2005 aerial survey
Submarine canyon					
0-30 meters	NP	NP	NP	NP	NOAA
30-100 meters	NP	NP	NP	NP	NOAA
100-200 meters	NP	NP	NP	NP	NOAA
>200 meters	NP	NP	NP	NP	NOAA

1 = Based on currently available mapping data  
NP = Habitat not present in study region

### 3.0 Protection Levels of Existing MPAs

The level of protection afforded by an MPA varies according to its specific regulations, particularly on allowed take of marine resources. Preliminary levels of protection for existing MPAs have been assigned by staff, based on the criteria established in the central coast process (Table 4) into the following categories: state marine reserve (SMR), state marine conservation area (SMCA) high, SMCA moderate, SMCA low, and state marine park (SMP) low.

The highest SAT protection level is “SMR” and corresponds to those MPAs that do not allow any take of marine life. “SMCA high” is the next highest protection level and generally includes SMCAs that only allow take of pelagic finfish and prohibit bottom contact of any fishing gear. MPAs designated as “SMCA high” only allow the take of pelagic finfish in waters deeper than 50 meters, to help prevent interactions between the surface take and benthic ecosystems. SMCAs that allow some bottom contact, such as spot prawn traps, and may also allow some small scale hand harvest of giant kelp were categorized as “SMCA moderate”. The remaining categories, “SMCA low” and “SMP low,” are the lowest levels of protection and may allow take of groundfish, mechanical kelp harvest, or other activities that may have significant effects on marine ecosystems.

**Table 4. Names, Regulations, and Preliminary Protection Levels for Existing MPAs in the MLPA North Central Coast Study Region (from North to South)**

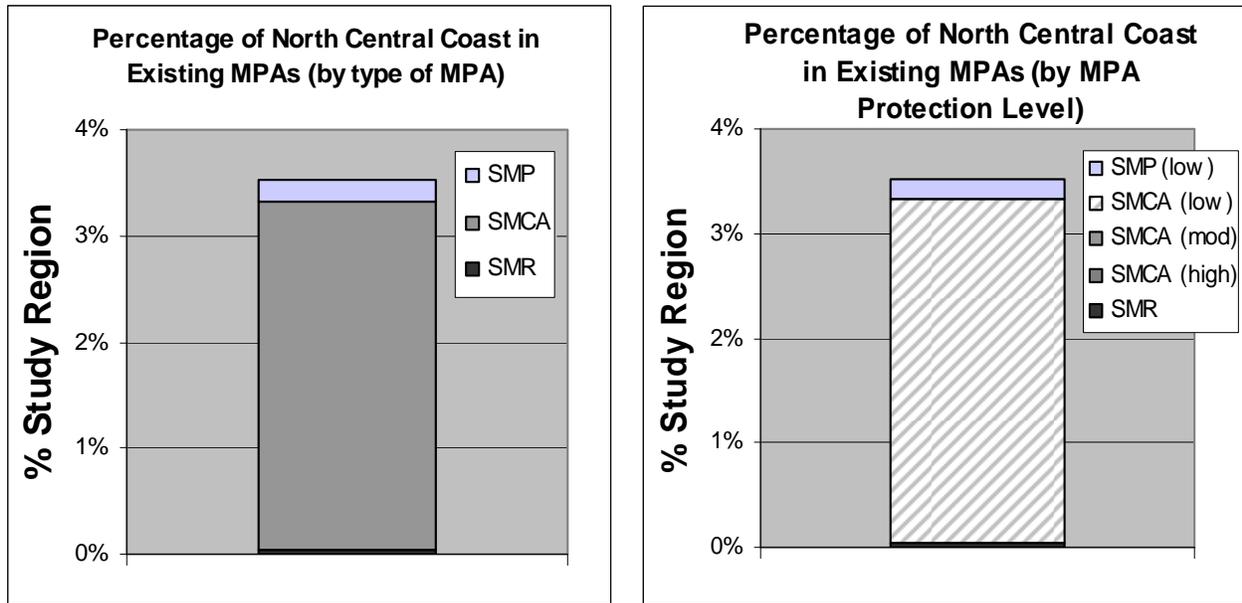
MPA Name	Allowed Take	Preliminary Protection Level
Manchester and Arena Rock SMCA	Allows recreational and commercial take of finfish and some invertebrates including red abalone, chiones, clams, cockles, rock scallops, native oysters, crabs, lobsters, ghost shrimp, sea urchins, mussels, and worms. Allows commercial take of some algae.	SMCA Low
Del Mar Landing SMP	Take of all living marine resources is prohibited except the recreational take of finfish by hook and line or spear.	SMP Low
Salt Point SMCA	<p>Only the following species may be taken recreationally: finfish, red abalone, chiones, clams, cockles, rock scallops, native oysters, crabs, lobsters, ghost shrimp, sea urchins, mussels and marine worms except that no worms may be taken in any mussel bed unless taken incidentally to the take of mussels.</p> <p>Only the following species may be taken commercially: finfish, crabs, ghost shrimp, jackknife clams, sea urchins, algae (except giant kelp and bull kelp) and worms except that no worms may be taken in any mussel bed, nor may any person pick up, remove, detach from the substrate any other organisms, or break up, move or destroy any rocks or other substrate or surfaces to which organisms are attached.</p>	SMCA Low
Gerstle Cove SMCA	Take of all living marine resources is prohibited except the commercial take of finfish and algae (except giant kelp and bull kelp).	SMCA Low

*California Marine Life Protection Act Initiative  
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<b>MPA Name</b>	<b>Allowed Take</b>	<b>Preliminary Protection Level</b>
Fort Ross SMCA	<p>No recreational take of living or non-living marine resources is allowed except: finfish, red abalone, chiones, clams, cockles, rock scallops, native oysters, crabs, lobsters, ghost shrimp, sea urchins, mussels and marine worms except that no worms may be taken in any mussel bed unless taken incidentally to the take of mussels.</p> <p>Commercial take of species other than giant kelp and bull kelp is allowed.</p>	SMCA Low
Sonoma Coast SMCA	<p>No recreational take of living or non-living marine resources is allowed except: finfish, red abalone, chiones, clams, cockles crabs, ghost shrimp, mussels, native oysters, rock scallops, sea urchins and marine worms except that no worms may be taken in any mussel bed unless taken incidentally to the take of mussels.</p> <p>Commercial take of species other than giant kelp and bull kelp is allowed.</p>	SMCA Low
Bodega SMR	All commercial and recreational take prohibited.	SMR
Tomales Bay SMP	Take of all living marine resources is prohibited except the recreational hook and line take of species other than marine aquatic plants. Only lightweight, hand-carried boats may be launched or operated within the Park.	SMP Low
Point Reyes Headlands SMCA	Take of all living marine resources is prohibited except the commercial take of finfish and algae other than giant kelp and bull kelp.	SMCA Low
Estero de Limantour SMCA	Take of all living marine resources is prohibited except the commercial take of finfish and algae other than giant kelp and bull kelp.	SMCA Low
Duxbury Reef SMCA	<p>Only the following species may be taken recreationally: red abalone, Dungeness crab, rock crabs, rockfish (family Scorpaenidae), lingcod, cabezon, surfperch (family Embiotocidae), halibut, flounder, sole, turbot, salmon, kelp greenling, striped bass, steelhead, monkeyface-eel, wolf-eel, smelt, and silversides.</p> <p>Commercial take of species other than giant kelp and bull kelp is allowed.</p>	SMCA Low
Farallon Islands SMCA	Area closures prevent take in certain nearshore locations from March 15 through August 15 of each year. Otherwise all take is allowed.	SMCA Low
James V. Fitzgerald SMP	Take of all living marine resources is prohibited except the recreational take by hook and line or spear of: rockfish (family Scorpaenidae), lingcod, surfperch (family Embiotocidae), monkeyface eel, rock eel, white croaker, halibut, cabezon, kelp greenling, and smelt (Families Osmeridae and Atherinidae).	SMP Low

Using these protection levels, it is possible to compare the percentage of the total area of the study region within existing MPAs, as grouped by the three MPA designations and as grouped by protection levels (Figure 1). Less than 4% of the study region is currently within existing MPAs; most of that area is in relatively low protection MPAs.

**Figure 1. Percentage of Study Region Area Covered by Existing MPAs by Designation and Protection Level**



#### 4.0 Evaluation of Existing MPAs with Regard to MLPA Goals

##### 4.1 Habitat Protection of Existing MPAs (Goals 1 and 4)

The evaluation of goals 1 and 4 of the MLPA focused on representation of available habitats in existing MPAs of different designation and protection levels. The degree to which existing MPAs include representative habitats within the north central coast was evaluated by determining the percentage of available habitat in the study region and each subregion and evaluating how much of that available habitat is included in MPAs. Coverage of habitats within various levels of protection is assessed for thresholds between 5% and 30% (Figure 2). Each column represents a different threshold, with the threshold amount increasing from left to right. More filled boxes in each column represents more habitats protected to that threshold level of the total amount available. It is important to note that these thresholds do not indicate any preference or recommended amount of habitat to include in MPAs; rather, they are used to compare across potential MPA alternatives.

**Figure 2. Analysis of Habitat Protection in Existing MPAs in the MLPA North Central Coast Study Region by Subregion**

	Existing MPAs >= 5%	Existing MPAs >= 10%	Existing MPAs >= 15%	Existing MPAs >= 20%	Existing MPAs >= 30%	
<b>Subregion 1</b>						SMR
Sand Beach						SMCA High
Rocky Intertidal						SMCA Mod
Estuary						SMCA Low/SMP Low
Shallow Sand						N/A
Deep Sand						
Shallow Rock						
Deep Rock						
Kelp						
<b>Subregion 2</b>						
Sand Beach						
Rocky Intertidal						
Estuary						
Shallow Sand						
Deep Sand						
Shallow Rock						
Deep Rock						
Kelp						
<b>Subregion 3</b>						
Sand Beach						
Rocky Intertidal						
Estuary						
Shallow Sand						
Deep Sand						
Shallow Rock						
Deep Rock						
Kelp						
<b>Subregion 4</b>						
Sand Beach						
Rocky Intertidal						
Estuary						
Shallow Sand						
Deep Sand						
Shallow Rock						
Deep Rock						
Kelp						
<b>Subregion 5</b>						
Sand Beach						
Rocky Intertidal						
Estuary						
Shallow Sand						
Deep Sand						
Shallow Rock						
Deep Rock						
Kelp						
<b>Subregion 6</b>						
Sand Beach						
Rocky Intertidal						
Estuary						
Shallow Sand						
Deep Sand						
Shallow Rock						
Deep Rock						
Kelp						

#### 4.2 Size and Spacing of Existing MPAs (Goals 2 and 6)

Size and spacing of representative habitats within MPAs will influence the degree of biological connectivity among MPAs. Size and spacing guidelines were established by the SAT, and adopted by the California Fish and Game Commission in the *California Marine Life Protection*

*Act Initiative Master Plan Framework* and have been carried forward to the current draft master plan (CDFG 2006). In general terms, larger MPAs are more likely to protect a greater proportion of the adult home-range of species of interest and thus create areas where individuals can produce larvae that might be exported outside of the MPA. The distance between each habitat type within MPAs helps to determine whether these exported larvae are likely to travel to another MPA with the appropriate habitats.

Considering the known adult home-ranges and larval dispersal distances of all species of interest, the 2005-2006 SAT determined guidelines for size and spacing of MPAs:

- For an objective of protecting the diversity of species that live at different depths and to accommodate the ontogenetic movement of individuals to and from nursery or spawning grounds to adult habitats, MPAs should extend from the intertidal zone to deep waters offshore.
- For an objective of protecting adult populations, based on adult neighborhood sizes and movement patterns, MPAs should have an alongshore span of 5-10 kilometers (3-6 miles or 2.5- 5.4 nautical miles) of coastline, and preferably 10-20 kilometers (6-12.5 miles or 5.4-11 nautical miles). Larger MPAs would be required to fully protect marine birds, mammals and migratory fish.
- For an objective of facilitating dispersal and connectedness of important bottom dwelling fish and invertebrate groups among MPAs, based on currently known scales of larval dispersal, MPAs should be placed within 50-100 kilometers (31-62 miles or 27-54 nautical miles) of each other.

(See "Considerations in the Design of MPAs" in the *California MLPA Master Plan for Marine Protected Areas*, CDFG 2006)

Evaluation of the size of the existing MPAs according to these criteria appears in Table 5; most existing MPAs are below the minimum size guideline. Note that minimum size was converted to an area measurement by using the SAT recommended offshore extent of three miles and the minimum alongshore span of three miles, resulting in a minimum MPA area of nine square miles (or a minimum preferred size of eighteen square miles using a six mile minimum preferred alongshore span). MPAs that are adjacent to one another are evaluated together as an MPA "cluster." In some cases, existing MPAs were created with overlapping boundaries. Gerstle Cove SMCA and Salt Point SMCA, as well as Sonoma Coast SMCA and Bodega SMR have boundaries that overlap, in which case the more stringent regulations were assumed to apply in the overlapping area.

**Table 5. Size Analysis for Existing MPAs in the MLPA North Central Coast Study Region**

Size Category	# of MPA Clusters	Below Minimum	At Minimum	Above Minimum
Length (all MPA clusters)	11	36%	64%	0%
Length (high protection clusters)	1	100%	0%	0%
Area (all MPA clusters)	11	91%	9%	0%
Area (high protection clusters)	1	100%	0%	0%

Table 6 displays the distance between each MPA in the study region, so that distances between any two MPAs can be compared to recommendations of the SAT (described above). The SAT recommendations for spacing are based upon different species that require different habitats. Thus, a full analysis would include not only spacing between MPAs, but spacing between the habitats they protect in “high protection” MPAs. This evaluation has not yet been completed for existing MPAs in part because there is only one existing MPA (Bodega SMR) that is considered high protection and the guidelines were designed in large part to evaluate spacing between high protection MPAs. Distances in Table 6 were calculated using the straight Euclidian distance between the centroids of each MPA. Distance around headlands was calculated using points offshore of each headland.

**Table 6. Distance Between North Central Coast MPAs (miles)**

MPA	Manchester and Arena Rock	Del Mar Landing	Salt Point	Gerstle Cove	Fort Ross	Sonoma Coast	Bodega	Tomales Bay	Point Reyes Headlands	Estero de Limantour	Duxbury Reef	James V Fitzgerald	Farallon Islands *
Manchester and Arena Rock	0.0	22.4	38.0	37.8	43.0	59.2	59.0	80.3	81.9	88.1	98.1	123.3	92.1
Del Mar Landing	22.4	0.0	15.3	15.4	21.3	36.6	37.5	58.1	60.1	67.5	76.3	101.6	76.9
Salt Point	59.2	15.3	0.0	0.4	6.1	21.3	22.1	42.7	45.0	51.0	61.5	86.5	56.4
Gerstle Cove	37.8	15.4	0.4	0.0	5.9	21.2	22.0	42.7	45.1	50.9	61.4	86.7	56.4
Fort Ross	43.0	21.3	6.1	5.9	0.0	15.4	16.3	36.9	40.1	46.1	55.8	82.2	51.8
Sonoma Coast	59.2	36.6	21.3	21.2	15.4	0.0	1.2	21.8	26.3	32.0	42.8	67.8	39.1
Bodega	59.0	37.5	22.1	22.0	16.3	1.2	0.0	20.6	25.1	32.2	41.4	67.1	38.2
Tomales Bay	80.3	58.1	42.7	42.7	36.9	21.8	20.6	0.0	35.2	40.5	51.7	76.8	48.3
Point Reyes Headlands	81.9	60.1	45.0	45.1	40.1	26.3	25.1	35.2	0.0	5.7	16.3	42.5	16.5
Estero de Limantour	88.1	67.5	51.0	50.9	46.1	32.0	32.2	40.5	5.7	0.0	14.3	42.7	21.8
Duxbury Reef	98.1	76.3	61.5	61.4	55.8	42.8	41.4	51.7	16.3	14.3	0.0	29.2	21.0
James V. Fitzgerald	123.3	101.6	86.5	86.7	82.2	67.8	67.1	76.8	42.5	42.7	29.2	0.0	30.1
Farallon Islands *	92.1	70.5	56.4	56.4	51.8	39.1	38.2	48.3	16.5	21.8	21.0	30.1	7.3 *

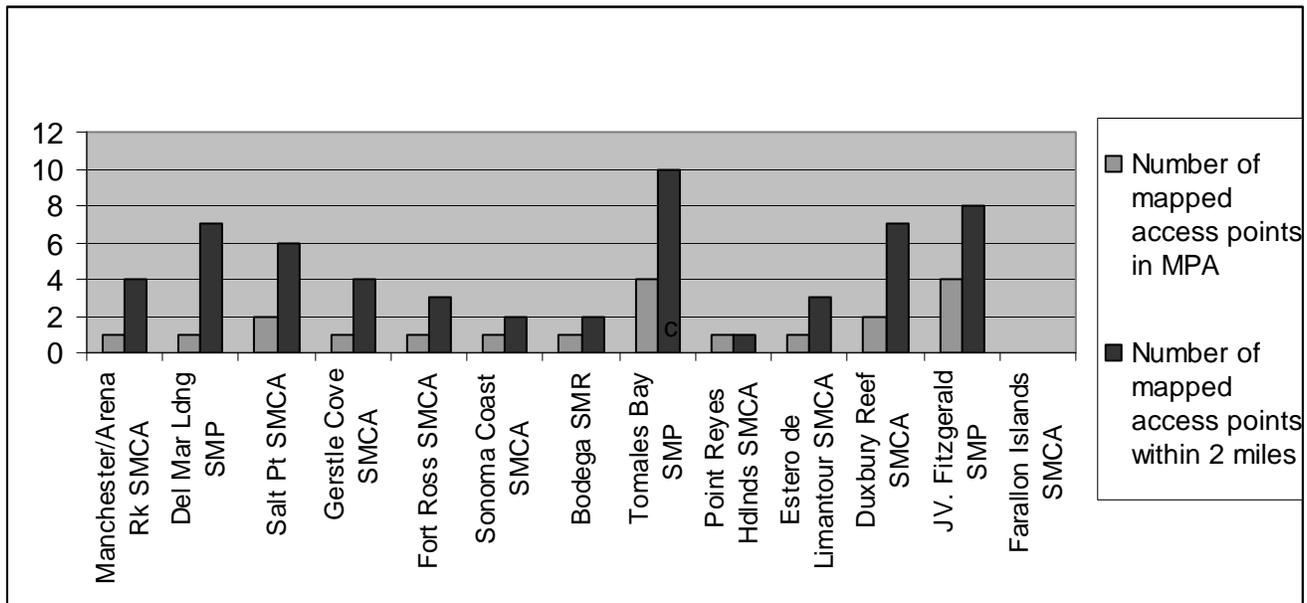
\* The Farallon Islands SMCA has two distinct sections. Distances between the Farallon Islands and MPAs north of Point Reyes were measured from the northern Farallon Islands section. Likewise, distances between the Farallon Islands and MPAs south of Point Reyes were measured from the southern Farallon Islands section. The distance between these two sections, 7.3 mi, is listed as the distance from the North Farallon Islands to the South Farallon Islands.

### 4.3 Recreational, Educational, and Study Opportunities (Goal 3)

The creation of recreational, educational, and study opportunities is difficult to directly assess, but can be approximated by considering the proximity of access points to an MPA, as well as the distance to boat ramps/launches and ports and research institutions.

Figure 3, below, displays how many mapped access points lie within the boundaries of MPAs and how many are close enough (2 miles) to access by kayak, boat, or other means. In this figure, Tomales Bay SMP has a large number of access points that are both within the MPA and close by, whereas Farallon Islands SMCA has no access points within or near the MPA.

**Figure 3: Mapped Access Points in or Near Existing MPAs**



Vessel access is also important for increasing recreation, education, and study opportunities. Table 7 shows the distance from each existing MPA to both smaller boat ramps/launches and major ports (Bodega Bay, San Francisco, and Princeton (Half Moon Bay)). In this table, Fitzgerald SMP and Bodega Bay SMR are nearest to vessel access locations, while the Farallon Islands SMCA is the most distant.

**Table 7: Distance to Boat Launch Locations and Ports**

Existing State MPA	Distance to Boat Ramp/Launch Site	Distance to Major Port
Manchester/Arena Rock SMCA	5 mi (Point Arena)	64 mi (Bodega Bay)
Del Mar Landing SMP	6 mi (Anchor Bay)	43 mi (Bodega Bay)

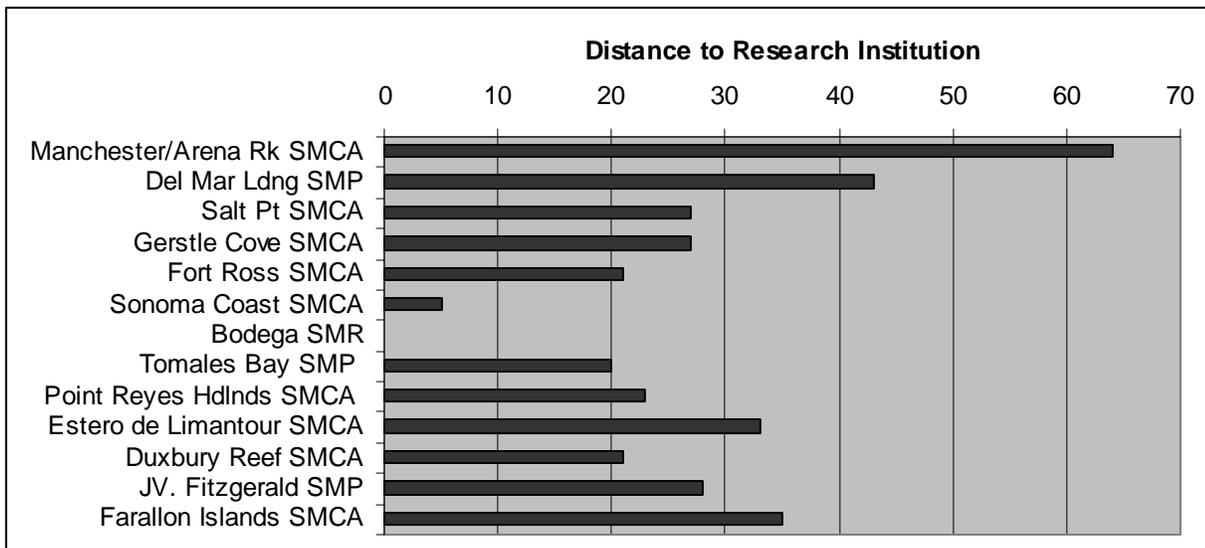
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Salt Pt SMCA	3 mi (Timber Cove)	27 mi (Bodega Bay)
Gerstle Cove SMCA	4 mi (Timber Cove)	27 mi (Bodega Bay)
Fort Ross SMCA	2 mi (Timber Cove)	21 mi (Bodega Bay)
Sonoma Coast SMCA	5 mi (Bodega Bay)	5 mi (Bodega Bay)
Bodega SMR	3 mi (Bodega Bay)	3 mi (Bodega Bay)
Tomales Bay SMP	1 mi (Inverness)	20 mi (Bodega Bay)
Point Reyes Headlands SMCA	19 mi (Bollinas)	23 mi (Bodega Bay)
Estero de Limantour SMCA	19 mi (Bollinas)	33 mi (Bodega Bay)
Duxbury Reef SMCA	2 mi (Bollinas)	18 mi (San Francisco)
James V. Fitzgerald SMP	1 mi (Princeton)	1 mi (Princeton)
Farallon Islands SMCA	22 mi (Bollinas)	31 mi (Princeton)

Note: These distances represent the straight-line distance along shore from the edge of the MPA to the vessel access location.

Increasing study opportunities may be partially evaluated by comparing the distance from MPAs to major research institutions (in this case, Bodega Bay Marine Lab (University of California, Davis) and Romberg Tiburon Center for Environmental Studies (San Francisco State University)). Figure 4 displays these distances, showing that Bodega SMR is nearest to a research institution (0 miles) and Manchester/Arena Rock SMCA is most distant.

**Figure 4: Distance to Major Marine Biological Research Institution**



#### 4.4 Replication of Habitats in Existing MPAs

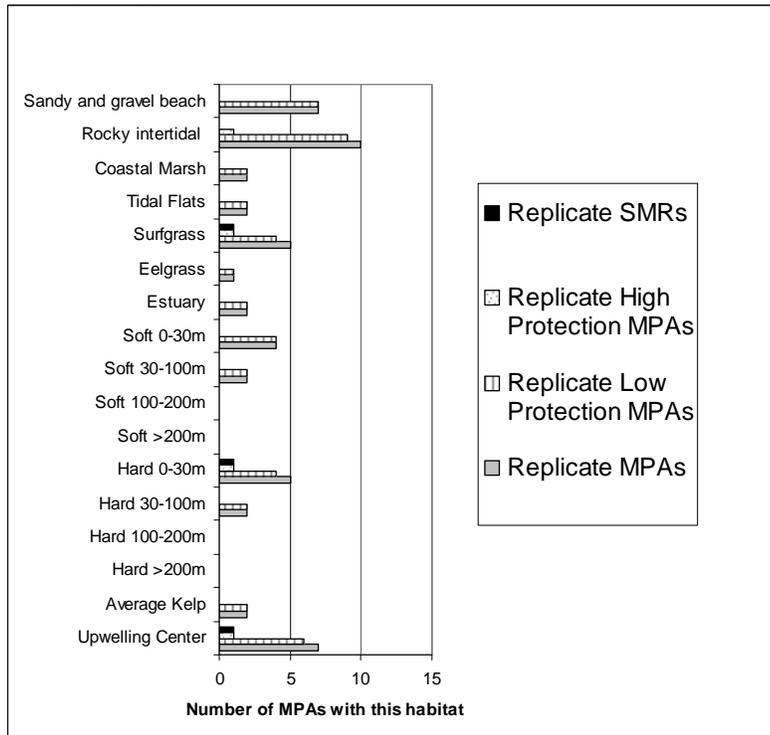
The draft *California Marine Life Protection Act Master Plan for Marine Protected Areas* (July 2006) recommends that habitats be replicated within MPAs:

For an objective of providing analytical power for management comparisons and to buffer against catastrophic loss of an MPA, at least three to five replicate MPAs should be designed for each habitat type ... within a biogeographical region."

(See "Considerations in the Design of MPAs" in the *California Marine Life Protection Act Master Plan for Marine Protected Areas*, CDFG 2006)

Note that the MLPA North Central Coast Study Region is only part (approximately one-third) of the biogeographical region that extends from the Oregon border to Point Conception. Figure 5 shows the replication of habitats within existing state MPAs in the study region. For this evaluation, the guidelines used in the central coast process were employed to determine if a habitat should be considered present in a MPA. A habitat is considered to be present and counting towards replication if it covers more than 20% of the MPA (for common habitats). For some habitats that are more rare in the study region, such as rocky habitat, deep sandy habitats, and kelp habitats, the habitat is considered replicated at a lower threshold (15% or 10%, depending on the habitat). If more that two square miles of any habitat is included in an MPA, then that habitat is considered present and counting towards replication.

**Figure 5. Replicate Habitats in Existing State MPAs in the MLPA North Central Coast Study Region**



## **5.0 Feasibility Analysis of Existing MPAs in the MLPA North Central Coast Study Region**

The boundary design of MPAs has a strong influence on whether they can be feasibly implemented, understood by the public, and enforced. The use of basic boundary design guidelines when siting MPA boundaries increases the likelihood of success for individual marine protected areas as well as the network as a whole. These boundary design guidelines are outlined in a DFG memo regarding feasibility criteria (Ugoretz 2007).

Several design elements were identified in DFG's feasibility criteria to increase MPA feasibility. These include:

- Boundaries
  - Straight lines
  - Easily recognizable landmarks
  - Multiple zoning of adjacent areas
- Regulations' simplicity
- Accessibility
- Siting within, adjacent to, or near special management areas

Table 8 provides a preliminary assessment of feasibility for existing state MPAs in the study region based on these criteria.

## **6.0 Summary of Findings**

The existing state MPAs in the MLPA North Central Coast Study Region do not meet the size and spacing guidelines and have a relatively small amount of most habitats represented in high protection MPAs.

None of the existing marine protected areas in the MLPA North Central Coast Study Region meet all of the feasibility criteria outlined in the DFG memo (see Table 8 for details of each MPA). A variety of "design elements that decrease MPA feasibility" are found in the suite of existing MPAs in the region. These include the use of depth contours and distance offshore as boundary delineations, the use of complex regulations, the use of different levels of protection sited within a protected area (i.e. doughnut holes), poor accessibility, and the siting of boundary points at areas which are not readily recognizable (such as at easily recognizable landmarks or at points of whole number latitude and longitude). In addition, a majority of the existing MPAs are either intertidal or nearshore in nature and do not extend protection into the adjacent subtidal waters, as outlined in the DFG memo regarding feasibility criteria and as recommended in the scientific guidelines for MPA design. Should any of these MPAs be included in alternative proposals, adjustments to boundary delineations should be considered to conform to the feasibility criteria as well as the scientific guidelines.

**Table 8. Compliance of Existing MPAs in the MLPA North Central Coast Study Region to Feasibility Criteria**

MPA	Design Criteria			
	Boundaries <sup>1</sup>	Simplicity of Regulations <sup>1</sup>	Accessibility <sup>2</sup>	Adjacent Special Management Areas <sup>2</sup>
Manchester & Arena Rock SMCA	<ul style="list-style-type: none"> <li>+ northern boundary aligns with an easily recognizable landmark</li> <li>- southern boundary does not use an easily recognizable landmark</li> <li>- does not follow whole minute lines of latitude</li> <li>- the western boundary does not follow a north/south orientation</li> </ul>	<ul style="list-style-type: none"> <li>- a long list of excepted species to the general regulation makes it difficult to understand and enforce the regulation.</li> </ul>	Appears to have access to beach area in some areas via Manchester State Park. Park has campsites but limited facilities.	Located adjacent to Manchester State Park
Del Mar SMP	<ul style="list-style-type: none"> <li>- boundaries do not follow a N/S E/W orientation</li> <li>- irregular shape</li> <li>- boundaries do not use easily recognizable landmarks</li> </ul>	Simple, however take by means other than hook and line or spear is prohibited.	Not easily accessed. Viewable via trail.	None adjacent
Salt Point SMCA	<ul style="list-style-type: none"> <li>+ boundaries generally follow a N/S E/W orientation</li> <li>+ boundaries appear to use easily recognizable landmarks with the exception of the south eastern boundary</li> <li>- Gerstle Cove SMCA sits inside Salt Point SMCA –creates a doughnut design</li> <li>- boundaries do not follow latitude and longitude lines and create irregular shape</li> </ul>	<ul style="list-style-type: none"> <li>- a long list of excepted species to the general regulation makes it difficult to understand and enforce the regulation.</li> <li>- doughnut design creates change in regulations over a small spatial area and can reduce public understanding and enforceability</li> </ul>	Appears highly accessible with parts viewable from Highway 1. The adjacent state park has numerous trails which increase accessibility. A visitor's center is located at Gerstle Cove.	Located adjacent to Salt Point State Park

*California Marine Life Protection Act Initiative  
Draft Preliminary Evaluation of Existing State Marine Protected Areas in the  
MLPA North Central Coast Study Region  
Revised September 24, 2007*

MPA	Design Criteria			
	Boundaries <sup>1</sup>	Simplicity of Regulations <sup>1</sup>	Accessibility <sup>2</sup>	Adjacent Special Management Areas <sup>2</sup>
Gerstle Cove SMCA	<ul style="list-style-type: none"> <li>+ boundaries appear to use easily recognizable landmarks</li> <li>- Gerstle Cove SMCA sits inside Salt Point SMCA –creates a doughnut design</li> <li>- boundaries do not follow latitude and longitude lines and create irregular shape</li> </ul>	<ul style="list-style-type: none"> <li>Regulation is simple, but allows commercial take and prohibits recreational take.</li> <li>- doughnut design creates change in regulations over a small spatial area and can reduce public understanding and enforceability</li> </ul>	<ul style="list-style-type: none"> <li>Appears highly accessible with parts viewable from Highway 1. The adjacent state park has numerous trails in creating accessibility. Site has a visitor's center which can enhance public awareness.</li> </ul>	<ul style="list-style-type: none"> <li>Located adjacent to Salt Point State Park</li> </ul>
Fort Ross SMCA	<ul style="list-style-type: none"> <li>- boundaries defined by irregular shaped lines using points of latitude and longitude as well as depth contours</li> <li>- boundaries do not appear to use easily recognizable landmarks</li> <li>boundaries do not follow N/S or E/W</li> </ul>	<ul style="list-style-type: none"> <li>- regulations do not extend into the adjacent subtidal waters and a long list of excepted species to the general regulation makes it difficult to understand and enforce the regulation.</li> </ul>	<ul style="list-style-type: none"> <li>Beach access via trail to MPA area. Adjacent Fort Ross State Park has many facilities including a visitor center and state park staff offices.</li> </ul>	<ul style="list-style-type: none"> <li>Located adjacent to Fort Ross State Park</li> </ul>
Sonoma Coast SMCA	<ul style="list-style-type: none"> <li>+ boundaries appear to use easily recognized landmarks</li> <li>- boundaries are defined by points of latitude and longitude as well as depth contours</li> <li>- has overlapping boundaries with Bodega SMCA</li> </ul>	<ul style="list-style-type: none"> <li>- appears to have overlapping boundaries with Bodega SMR which may decrease public understanding and enforceability</li> <li>- regulations do not extend into the adjacent subtidal waters</li> <li>- a long list of excepted species to the general regulation makes it difficult to understand and enforce the regulation.</li> </ul>	<ul style="list-style-type: none"> <li>Some of the MPA area is accessible and is easily viewable from Highway 1. Access points also lie along the Sonoma coast State Beach</li> </ul>	<ul style="list-style-type: none"> <li>Partially adjacent to Sonoma Coast State Beach</li> </ul>

*California Marine Life Protection Act Initiative  
Draft Preliminary Evaluation of Existing State Marine Protected Areas in the  
MLPA North Central Coast Study Region  
Revised September 24, 2007*

MPA	Design Criteria			
	Boundaries <sup>1</sup>	Simplicity of Regulations <sup>1</sup>	Accessibility <sup>2</sup>	Adjacent Special Management Areas <sup>2</sup>
Bodega SMR	<ul style="list-style-type: none"> <li>- boundaries are defined by points of latitude and longitude as well as depth contours</li> <li>- boundaries do not use easily recognizable landmarks</li> <li>- has overlapping boundaries with Sonoma Coast SMCA</li> </ul>	<ul style="list-style-type: none"> <li>- appears to have overlapping boundaries with Sonoma Coast SMCA which may decrease public understanding and enforceability</li> <li>- regulations do not extend into the adjacent subtidal waters</li> </ul>	<p>Parts of the SMR are accessible by the Adjacent Bodega Bay Marine Lab. Access is limited by marine lab regulations.</p>	<p>Partially adjacent to Sonoma Coast State Beach and UC Davis' Bodega Bay Marine Lab</p>
Tomales Bay SMP	<ul style="list-style-type: none"> <li>+ western boundary appears to use easily recognizable landmarks</li> <li>- eastern boundary does not appear to use easily recognizable landmarks</li> </ul>	<p>Boating regulations are not well defined and potentially inconsistent with desired uses</p>	<p>Appears to be easily observable via Highway 1 and Sir Francis Drake Boulevard. Several access points exist around Tomales Bay.</p>	<p>Located adjacent to Tomales Bay State Park and the Point Reyes National Seashore. Located within Gulf of Farallones National Marine Sanctuary (NMS)</p>
Point Reyes Headlands SMCA	<ul style="list-style-type: none"> <li>+ boundaries appear to use easily recognizable landmarks</li> <li>- boundaries are defined by points of latitude and longitude as well as distance offshore</li> </ul>	<ul style="list-style-type: none"> <li>- regulations do not extend into the adjacent subtidal waters</li> </ul>	<p>MPA seems to be observable though may be difficult to physically access. A visitor's center is located nearby at the lighthouse.</p>	<p>Located adjacent to the Point Reyes National Seashore. Located within Gulf of Farallones NMS</p>
Estero de Limantour SMCA	<ul style="list-style-type: none"> <li>+ boundaries appear to use easily recognizable landmarks</li> </ul>	<ul style="list-style-type: none"> <li>- Commercial take is allowed in an area not likely subject to commercial take</li> </ul>	<p>Accessibility appears limited, some hiking trails are nearby and an unpaved road that goes near the southern end of the MPA</p>	<p>Located within the Point Reyes National Seashore.</p>
Duxbury Reef SMCA	<ul style="list-style-type: none"> <li>+ boundaries appear to use easily recognizable landmarks</li> <li>- boundaries are defined by points of</li> </ul>	<ul style="list-style-type: none"> <li>- A long list of excepted species to the general regulation makes it difficult to</li> </ul>	<p>Accessibility appears limited, some hiking trails are nearby, and access to southern portion</p>	<p>Located partially within the Point Reyes National Seashore and</p>

*California Marine Life Protection Act Initiative  
Draft Preliminary Evaluation of Existing State Marine Protected Areas in the  
MLPA North Central Coast Study Region  
Revised September 24, 2007*

MPA	Design Criteria			
	Boundaries <sup>1</sup>	Simplicity of Regulations <sup>1</sup>	Accessibility <sup>2</sup>	Adjacent Special Management Areas <sup>2</sup>
	latitude and longitude as well as distance offshore	understand and enforce the regulation	via Agate Beach	adjacent to US Coast Guard facility. Located partially within Gulf of Farallones NMS.
James Fitzgerald SMP	+ southern boundary appears to use easily recognizable landmark; northern boundary does not use easily recognizable landmark - boundaries are defined by points of latitude and longitude as well as distance offshore	- regulations do not extend into the adjacent subtidal waters and a long list of excepted species to the general regulation makes it difficult to understand and enforce the regulation	Highly accessible to the public	Located adjacent to the Point Montara Light Station.
Farallon Islands SMCA	- boundaries are defined by points of latitude and longitude as well as distance offshore	- regulations are confusing and some are only in effect for certain periods of time throughout the year	Only accessible via boat	Located within the Gulf of the Farallones National Marine Sanctuary and adjacent to the Farallon National Wildlife Refuge.

<sup>1</sup> Aspects with a plus (+) are considered factors which increase feasibility, while aspects with a minus (-) are considered factors which decrease feasibility.

<sup>2</sup> These factors are not rated as increasing or decreasing feasibility because they may reflect advantages or disadvantages to feasibility depending on a variety of factors.

## **7.0 References**

California Department of Fish and Game (CDFG) July 2006. California Marine Life Protection Act Master Plan for Marine Protected Areas.

Ugoretz, John. June 11, 2007. Memorandum to the MLPA Initiative Blue Ribbon Task Force, Master Plan Science Advisory Team, and North Central Coast Regional Stakeholder Group. Statement of feasibility criteria for use in analyzing siting alternatives during the second phase of the Marine Life Protection Act Initiative.

**Appendix A. Year established, primary objectives for establishment, and a basic evaluation of existing MPAs in the NCCR. Information taken from the 2004 DFG evaluation of California's existing MPAs.**

<b>MPA Name</b>	<b>Year Established</b>	<b>Primary Objectives for Establishment</b>	<b>Basic Evaluation</b>
Manchester and Arena Rock SMCA	1970	This site was originally designated as a State Park and State Underwater Park. State parks are designated to preserve outstanding natural, scenic, and cultural values, indigenous aquatic and terrestrial fauna and flora, and the most significant examples of such ecological regions (Public Resources Code 5019.53 and Title 14, Section 4752).	The subtidal habitat consists of primarily sandy bottom, with the exception of the Arena Rock area. The primary objective in originally establishing this site as a state park was to preserve a significant example of the geomorphology within this ecological region. This goal, separate from any biological goal, is met under the current designation.
Del Mar Landing SMP	1972	This area was originally designated as an ecological reserve. Fish and Game Code Section 1580 (ecological reserves) states that "The policy of the state is to protect threatened or endangered native plants, wildlife, or aquatic organisms or specialized habitat types, both terrestrial and non-marine aquatic, or large heterogeneous natural gene pools for the future use of mankind through the establishment of ecological reserves." Although the language does not specifically refer to ecological reserves in marine areas, the Fish and Game Commission has extended this policy to those areas.	There are no current studies that speak to the efficacy of this site as an MPA.
Salt Point SMCA	1970	This site was originally designated as a State Park. State parks are designated to preserve outstanding natural, scenic, and cultural values, indigenous aquatic and terrestrial fauna and flora, and the most significant examples of such ecological regions	Salt Point is a highly utilized recreational and commercial fishing area. Due to the number of people frequenting the area that are aware of the limited restrictions currently in

*California Marine Life Protection Act Initiative  
Draft Preliminary Evaluation of Existing State Marine Protected Areas in the  
MLPA North Central Coast Study Region  
Revised September 24, 2007*

<b>MPA Name</b>	<b>Year Established</b>	<b>Primary Objectives for Establishment</b>	<b>Basic Evaluation</b>
		(Public Resources Code 5019.53 and Title 14, Section 4752, CCR). The Department of Parks and Recreation's General Plan states "the primary purpose of Salt Point State Park is to preserve the outstanding scenic, scientific, natural, and cultural values found on the Sonoma Coast, including offshore areas...".	place, the MPA functions to the extent of those regulations. Anecdotal references to increased numbers and size of individual species have varied from year to year, but in general speak to a positive effect relative to areas outside the MPA. Commercial Passenger Fishing Vessels commonly anchor in the MPA, shore-based anglers frequent the access points, and commercial urchin fishing activity also occurs in this area.
Gerstle Cove SMCA	1971	Protection of an area representative of the ecological characteristics and aquatic organisms of the region.	Anecdotal information suggests that current protection within the Gerstle Cove has enhanced and provided for increased abundance of individuals of a variety of species. Qualitative surveys conducted shortly after (3 years) the MPA was established indicated an increase in the abalone population within the MPA.
Fort Ross SMCA	1970	This site was originally designated as a State Historic Park and State Underwater Park. State historic parks are established to preserve objects of historical, archaeological, and scientific interest, historic sites and places commemorating important persons or historic events (Public Resources Code 5019.59 and Title 14, Section 4751, CCR).	The primary objective in originally establishing this state historic park was the preservation of the various shipwreck sites in the area; preservation of these sites is achieved under the current status. The current regulations provide limited protection for the invertebrate species listed above, however this area does not function as a biological reserve. Fort

*California Marine Life Protection Act Initiative  
Draft Preliminary Evaluation of Existing State Marine Protected Areas in the  
MLPA North Central Coast Study Region  
Revised September 24, 2007*

<b>MPA Name</b>	<b>Year Established</b>	<b>Primary Objectives for Establishment</b>	<b>Basic Evaluation</b>
			<p>Ross Cove is utilized regularly by Commercial Passenger Fishing Vessels. Two long-term diving rangers have reported substantial declines in rockfish populations over the past 20 years. Commercial urchin fishing currently occurs within the MPA boundaries, and could continue as it has had a positive effect on kelp establishment and overall biodiversity.</p>
<p>Sonoma Coast SMCA</p>	<p>1970</p>	<p>This site was originally designated a State beach. State beaches are designed in areas with frontage on the ocean or bays designed to provide swimming, boat, fishing, and other beach-oriented activities (Public Resources Code 5019.56 and Title 14, Section 4753, CCR).</p>	<p>The primary objective in establishing this site was to provide for recreational activities, including fishing. The site fulfills this objective. However Sonoma Coast State Marine Conservation Area does not function as a marine protected area other than providing limited protection for invertebrate species. Commercial Passenger Fishing Vessels frequently utilize this area of coastline.</p>
<p>Bodega SMR</p>	<p>1965 (full protection established in 1999)</p>	<p>Protection of marine plants and invertebrates.</p>	<p>This MPA is relatively small and is the only existing MPA in the between Humboldt and Monterey counties which is entirely marine and which has complete protection for all marine organisms. Complete protection has only been afforded to this MPA, originally established as a Marine Life Refuge, since 1999, a relatively short time period in which to access its</p>

*California Marine Life Protection Act Initiative  
Draft Preliminary Evaluation of Existing State Marine Protected Areas in the  
MLPA North Central Coast Study Region  
Revised September 24, 2007*

<b>MPA Name</b>	<b>Year Established</b>	<b>Primary Objectives for Establishment</b>	<b>Basic Evaluation</b>
			function as a no-take MPA. However, several studies utilize the MPA as a comparative baseline for species protected from the effects of fishing (i.e., urchins, crab, and abalone). The current boundaries of the MPA are honored and generally accepted by users groups.
Tomales Bay SMP	1973	This area was originally designated as an ecological reserve. Fish and Game Code Section 1580 (ecological reserves) states that "The policy of the state is to protect threatened or endangered native plants, wildlife, or aquatic organisms or specialized habitat types, both terrestrial and non-marine aquatic, or large heterogeneous natural gene pools for the future use of mankind through the establishment of ecological reserves." Although the language does not specifically refer to ecological reserves in marine areas, the Fish and Game Commission has extended this policy to those areas.	There are no current studies that speak to the efficacy of this site as an MPA.
Point Reyes Headlands SMCA	1972	Protection of invertebrates.	There are no current studies that speak to the efficacy of this site as an MPA; the existing regulations provide limited protection for invertebrates in the nearshore (primary objective).
Estero de Limantour SMCA	1971	To protect estuarine habitat.	There are no studies reporting the efficacy of this area as an MPA. Although this MPA technically permits some commercial take, it functions as a defacto

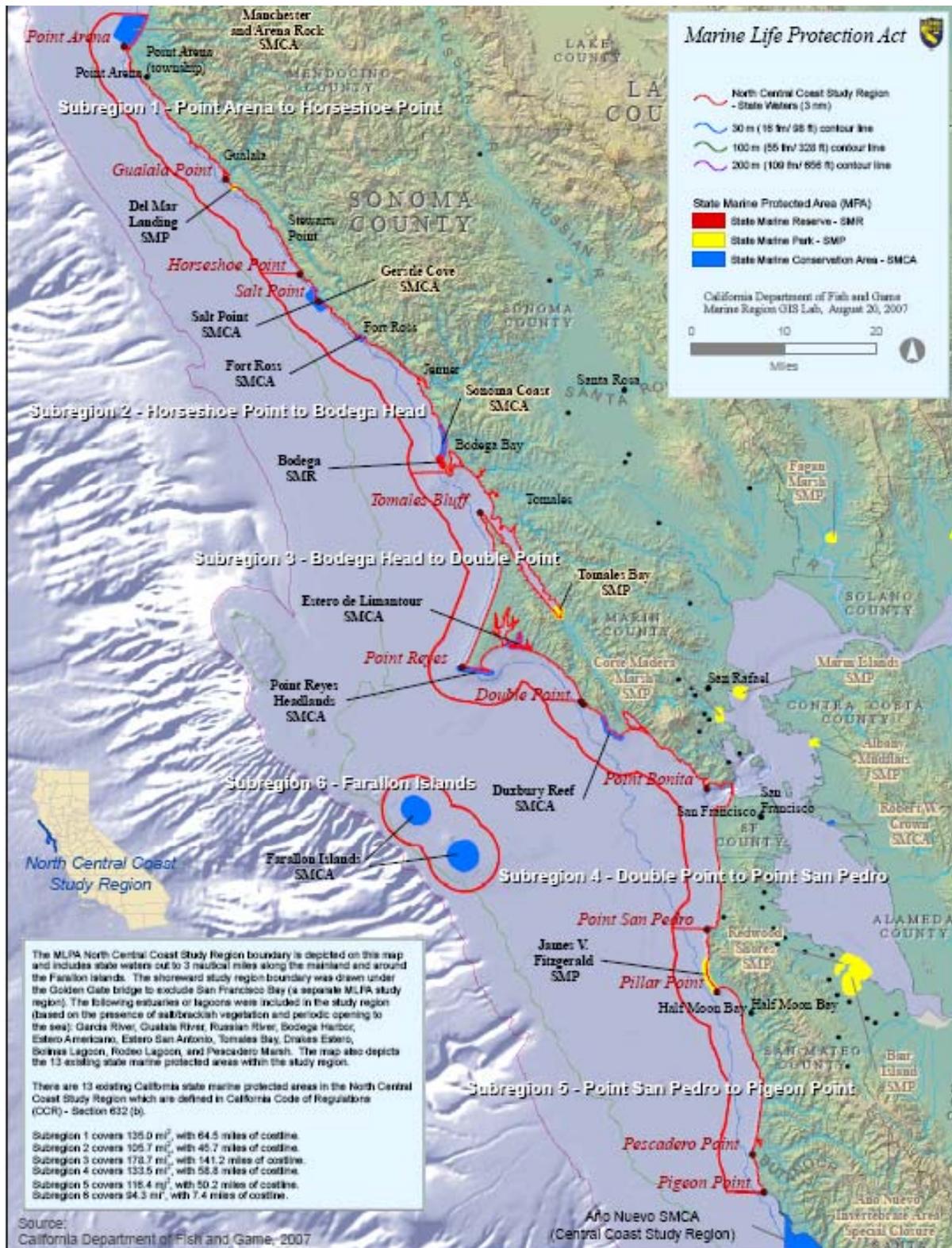
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Draft Preliminary Evaluation of Existing State Marine Protected Areas in the  
MLPA North Central Coast Study Region  
Revised September 24, 2007*

<b>MPA Name</b>	<b>Year Established</b>	<b>Primary Objectives for Establishment</b>	<b>Basic Evaluation</b>
			fully protected area from consumptive use.
Duxbury Reef SMCA	1971	Protect communities of a Monterey shale outcrop, especially the intertidal biota.	The primary objective in establishing this area was to provide protection for invertebrate species while allowing hook-and-line fishing from shore. Due to local conservation education efforts, this MPA fulfills its initial objective to prohibit recreational take of invertebrate species except red abalone. Use of the area has evolved since the MPA designation and commercial harvest occurs on the reef and near the reef, possibly affecting the populations the original designation was designed to protect.
Farallon Islands SMCA	1991	This area was originally designated as an ecological reserve. Fish and Game Code Section 1580 (ecological reserves) states that "The policy of the state is to protect threatened or endangered native plants, wildlife, or aquatic organisms or specialized habitat types, both terrestrial and nonmarine aquatic, or large heterogeneous natural gene pools for the future use of mankind through the establishment of ecological reserves." Although the language does not specifically refer to ecological reserves in marine areas, the Fish and Game Commission has extended this policy to those areas.	Although technically an MPA, this site offers no additional permanent protection to subtidal marine organisms above and beyond the relevant Fish and Game regulations. The seasonal area closures afford a greater degree of protection to marine birds and mammals from the aspect of behavioral disturbances and may provide seasonal protection to nearshore subtidal species.

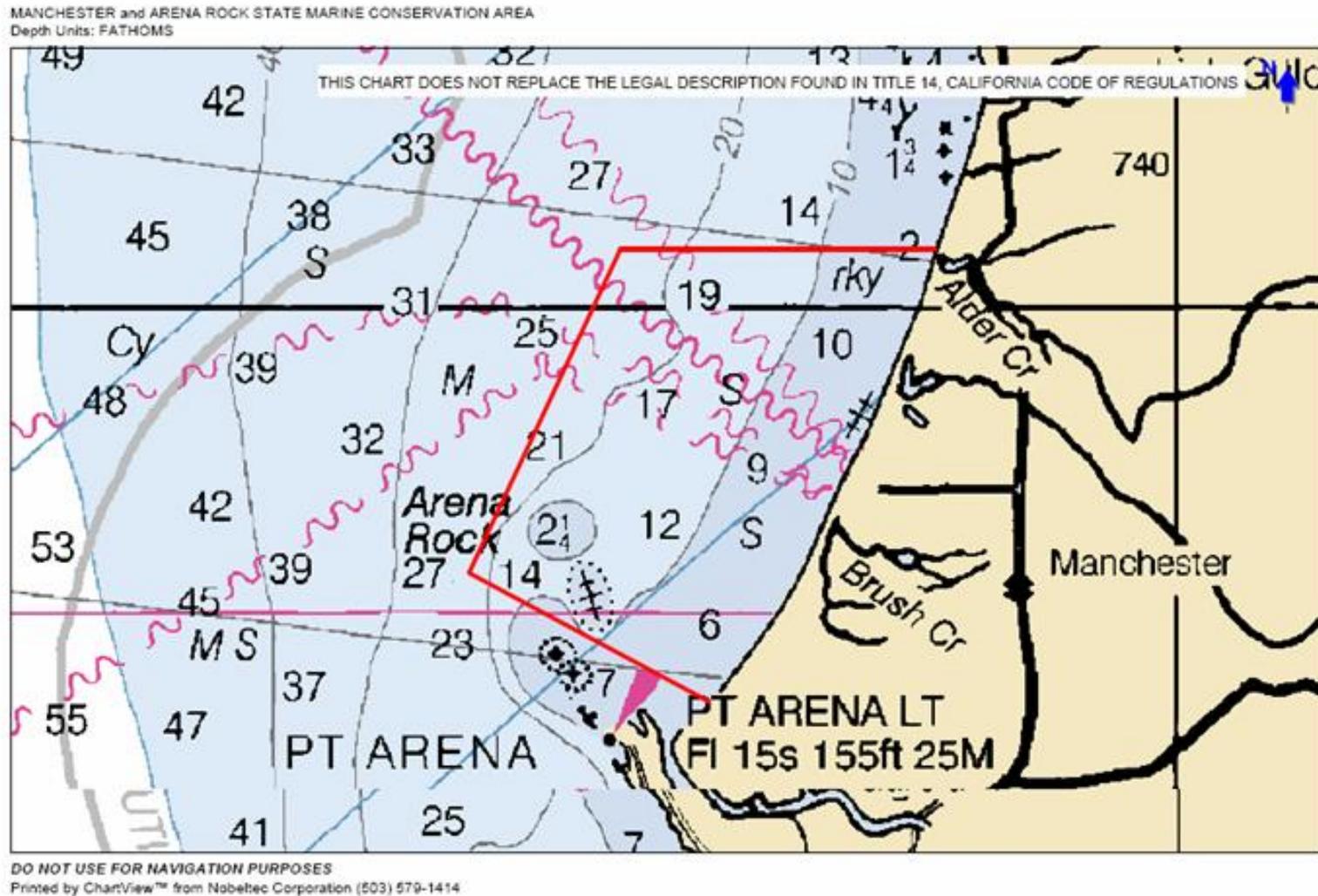
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Draft Preliminary Evaluation of Existing State Marine Protected Areas in the  
MLPA North Central Coast Study Region  
Revised September 24, 2007*

<b>MPA Name</b>	<b>Year Established</b>	<b>Primary Objectives for Establishment</b>	<b>Basic Evaluation</b>
		<p>The Farallon Islands were designated specifically to protect populations of nesting marine birds and breeding marine mammals from noise associated with vessel traffic. The U.S. Fish and Wildlife Service (USFWS) wanted to prohibit fishing within 1 mile of shore of all of the Farallon Islands year-round, but a compromise was reached with fishing interests and the Department to establish seasonal closures closer to shore around some of the islands.</p>	
James V. Fitzgerald SMP	1969	<p>This shoreline and reef area has been of interest to biologists, preservationists, and collectors since as early as 1908. As a result, resource depletion has long been an issue. In an effort to protect the area, in the 1960's the County of San Mateo proposed that the State of California designate the area as a "state reserve". Legislation was approved for the reserve status in 1969.</p>	<p>Areas within the MPA that are remote from access as well as areas that are policed often function to protect species as originally intended. However, this is a high use area in which the primary concern is user access hampering resource protection. The area has both enforcement resources and public support.</p>

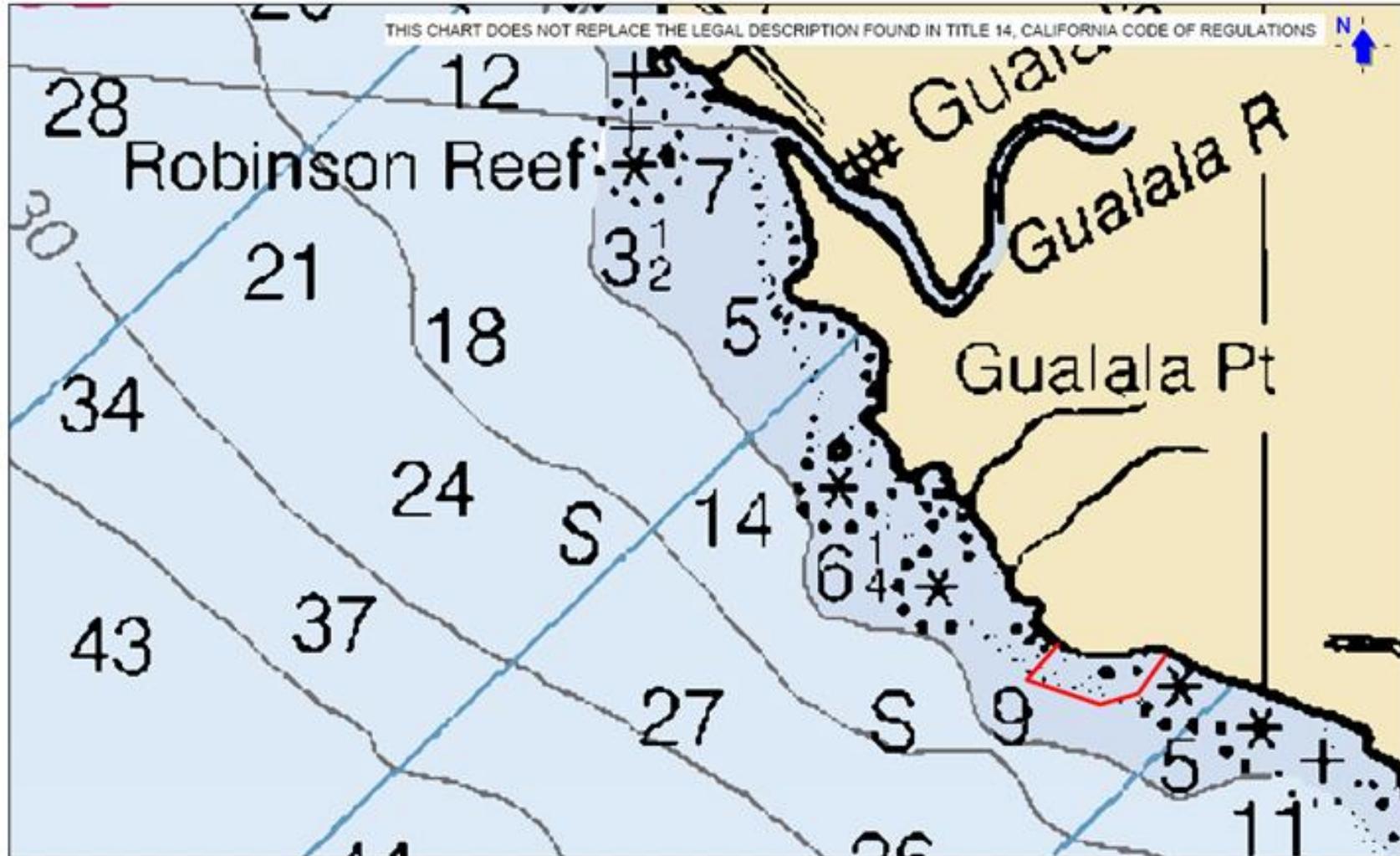
**Appendix B. Map of Existing MPAs in the MLPA North Central Coast Study Region**



Appendix C. Individual Maps of Existing MPAs in the MLPA North Central Coast Study Region



DEL MAR LANDING STATE MARINE PARK  
Depth Units: FATHOMS

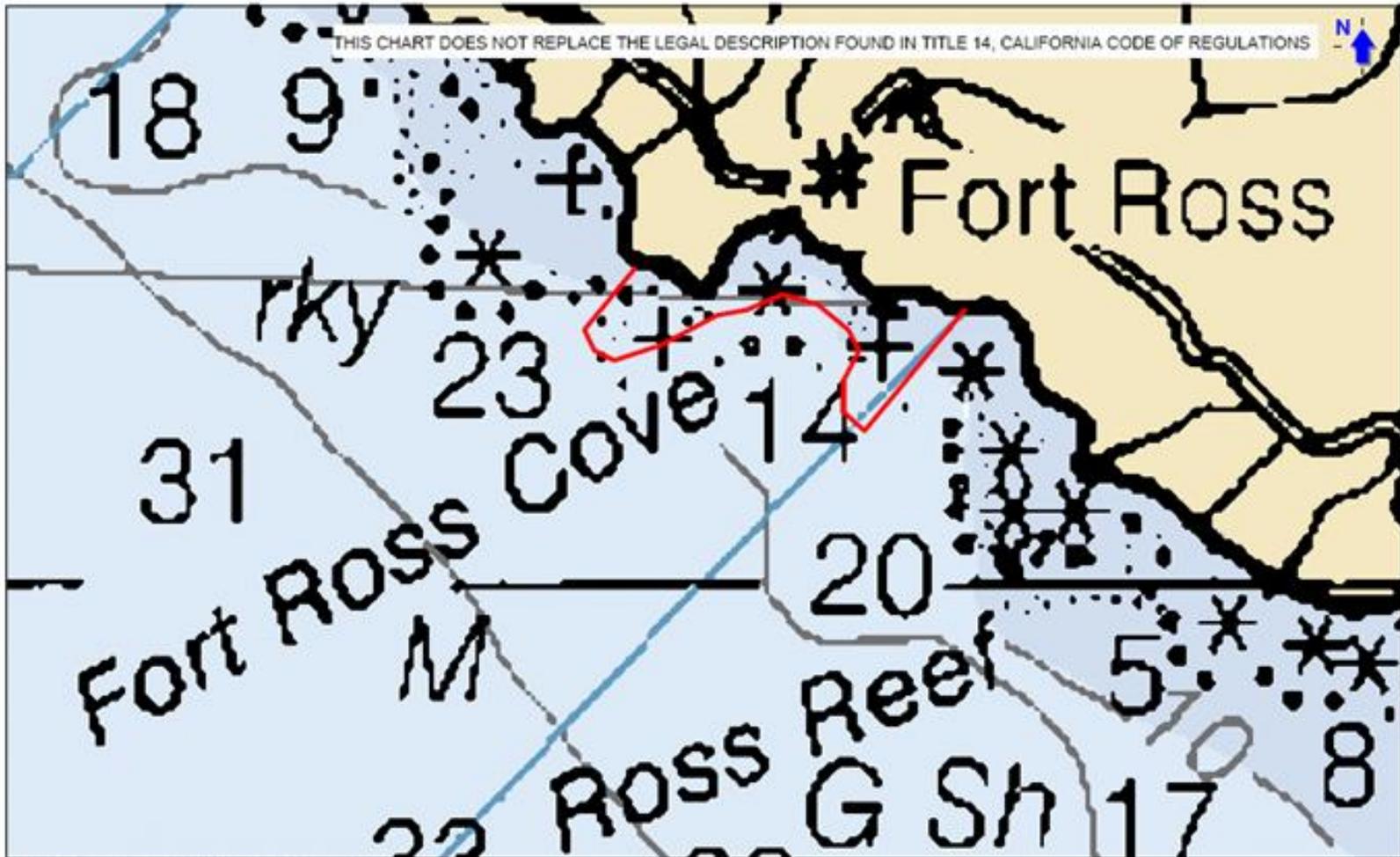


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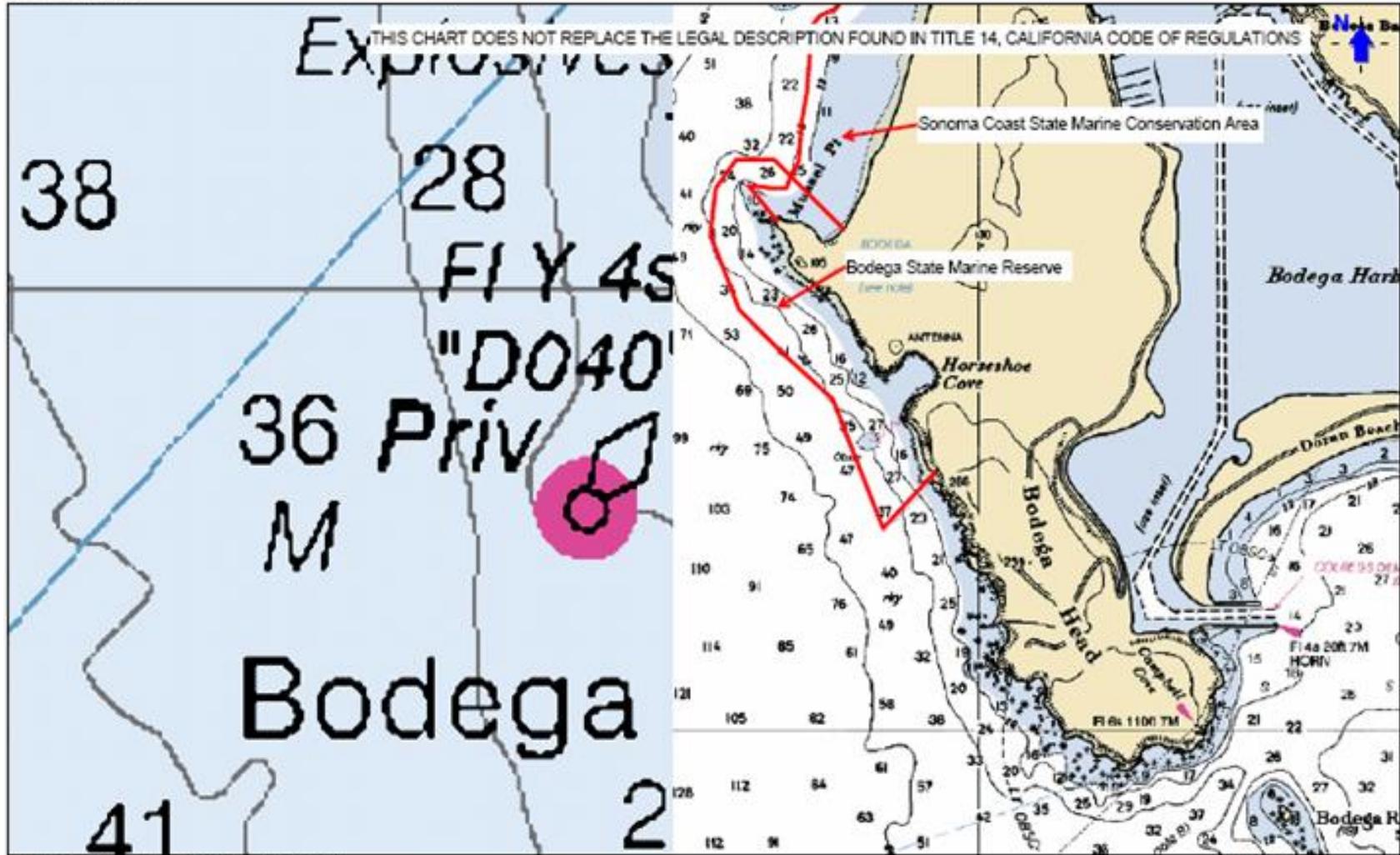
FORT ROSS STATE MARINE CONSERVATION AREA  
Depth Units: FATHOMS



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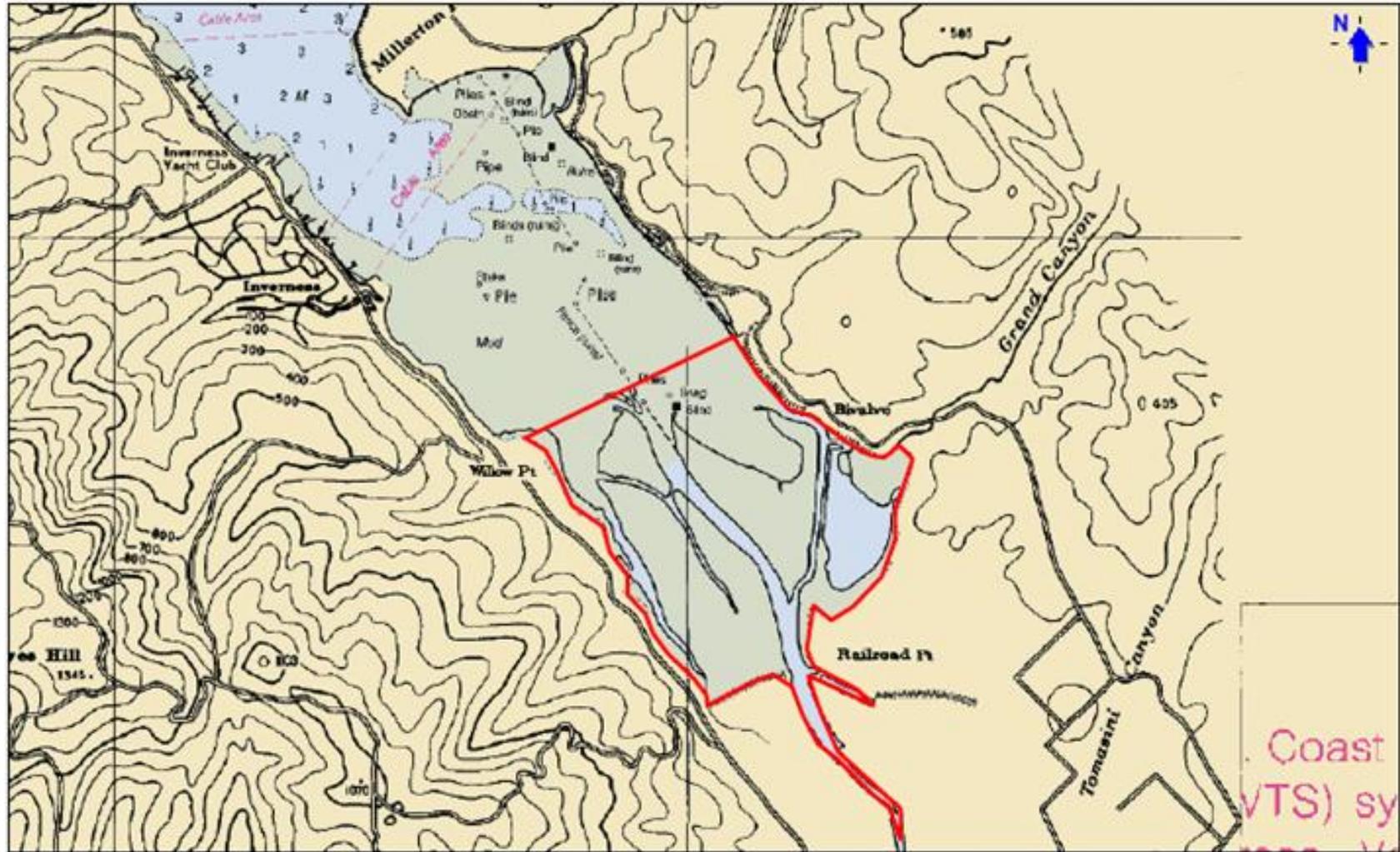
BODEGA STATE MARINE RESERVE  
Depth Units: FEET



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TOMALES BAY STATE MARINE PARK  
Depth Units: FEET

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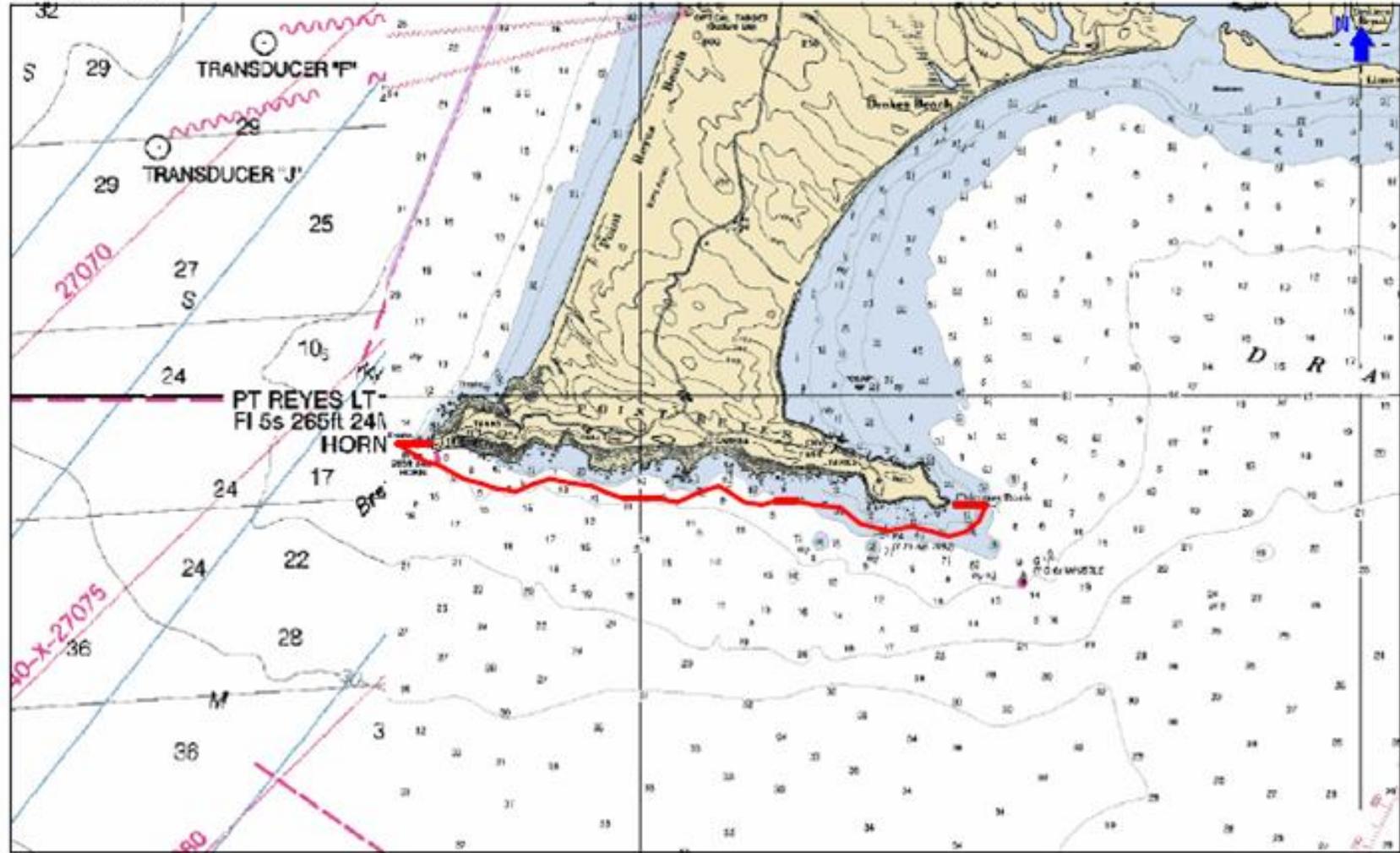


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Nautical Miles  
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POINT REYES STATE MARINE CONSERVATION AREA  
Depth Units: FATHOMS

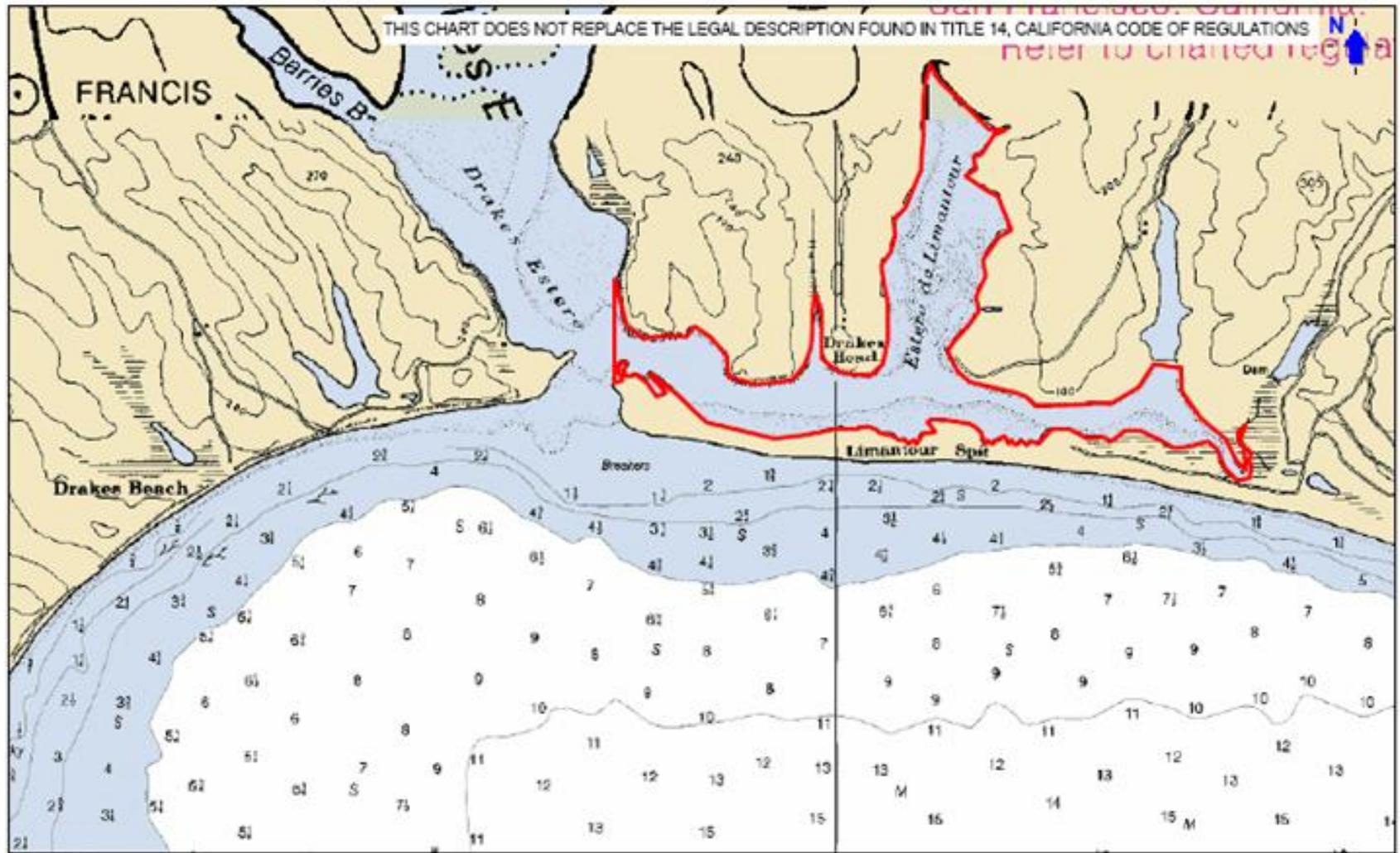
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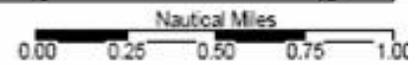
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Nautical Miles  
0.00 0.50 1.00 1.50

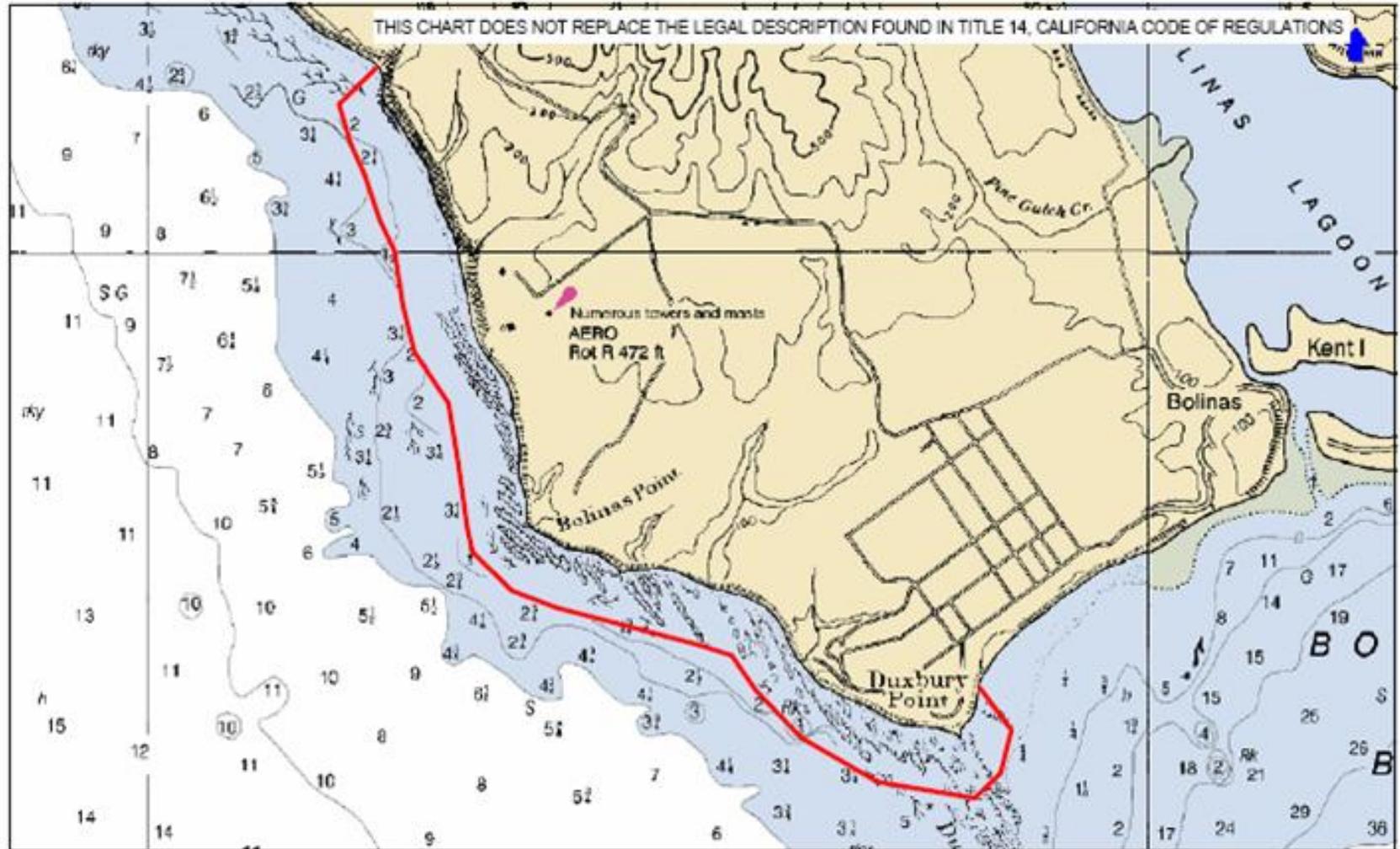
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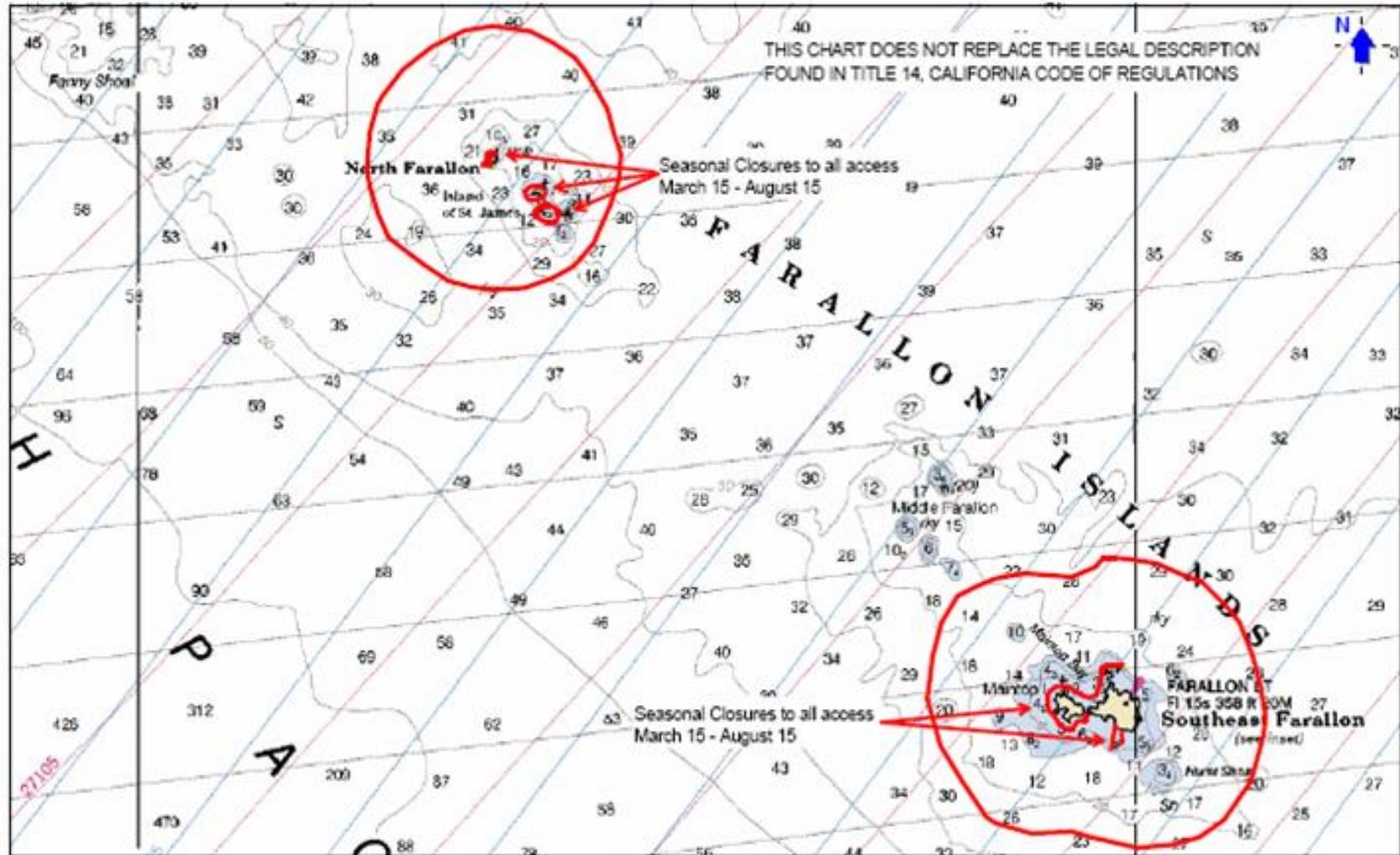
DUXBURY REEF STATE MARINE CONSERVATION AREA  
Depth Units: FATHOMS



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Draft Preliminary Evaluation of Existing State MPAs in the MLPA North Central Coast Study Region  
July 3, 2007

FARALLON ISLANDS STATE MARINE CONSERVATION AREA  
Depth Units: FATHOMS



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California Marine Life Protection Act Initiative  
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July 3, 2007

