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# PROTECTING TOMALES BAY BY MANAGING VESSEL USAGE:

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## A DOCUMENT FOR PUBLIC INPUT

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NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION  
NATIONAL OCEAN SERVICE  
NATIONAL MARINE SANCTUARY PROGRAM



CALIFORNIA STATE LANDS COMMISSION  
DIVISION OF ENVIRONMENTAL PLANNING AND  
MANAGEMENT

This document represents the first step of a multi-agency effort to coordinate current and future vessel-related activities to improve water quality, protect wildlife and habitat, and protect public health and ensure recreational opportunities in Tomales Bay. The document presents activities currently being implemented by the participating agencies as well as proposed strategies for vessel management. The purpose of this document is to engage individuals and organizations in the local community and users of Tomales Bay in developing strategies to accomplish the goals of ecosystem and public health protection by managing activities related to vessel use in the Bay. Comments and questions about this document should be directed to:

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#### ACKNOWLEDGEMENTS:

Representatives of several public agencies have met since 1994 to clarify jurisdictions, share information and ideas, and to identify options to present for public input for improving vessel-related management in Tomales Bay. The National Oceanic and Atmospheric Administration's (NOAA) Gulf of the Farallones National Marine Sanctuary (GFNMS) is facilitating this collaborative process. The California State Lands Commission is a co-lead with the GFNMS in the process. The GFNMS would like to acknowledge the agencies and their representatives that have consistently devoted time and resources to consider vessel usage issues in Tomales Bay and to develop this draft Document. The current members of the Committee include:

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Over time, Committee representation has changed. GFNMS would like to thank the many people who in the past have participated in meetings and provided information and support. In particular, we wish to thank Rebecca Tuden who previously represented the San Francisco Regional Water Quality Control Board and Marin County on the Committee for her tireless efforts in facilitating the Committee and drafting this document in its early stages.

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## **EXECUTIVE SUMMARY**

Tomales Bay has long been recognized by citizens, local, state, and federal agencies as a special place deserving a high level of ecosystem protection. In 1962, portions of Tomales Bay on the west shore were established as part of the Point Reyes National Seashore (PRNS). In 1972, additional areas of Tomales Bay on the east shore were designated as part of the Golden Gate National Recreation Area (GGNRA). In 1979, Tomales Bay was designated as a “Special Resource Area” by the California Coastal Commission. Under the state non-point source pollution regulatory program, Tomales Bay is listed as one of the state’s Critical Coastal Areas. In 1981, the majority of Tomales Bay was designated part of the Gulf of the Farallones National Marine Sanctuary (GFNMS). Tomales Bay was also designated in September 2002 by the United Nations as a “Wetland of International Significance” in an international treaty known as the Ramsar Convention on Wetlands.

The Bay supports a diversity of flora, fauna and habitats. Thousands of species of birds, a variety of invertebrates, marine mammals, fish and plants, and numerous threatened and endangered species inhabit the Bay. The Bay also supports seven active commercial shell-fishing leases and is the third largest commercial shellfish area in California. Over 2 million visitors per year come to Tomales Bay to explore the beautiful parklands and enjoy the water-related recreational opportunities of this watershed. Human activity within the watershed has resulted in some degradation of the Bay’s water quality, habitats, and special status species. The Bay was listed as an impaired water body by the San Francisco Regional Water Quality Control Board for pathogens, sediment, mercury, and nutrients.

Beginning in 1994, a group of local, state, and federal agencies with jurisdiction over various parts of the Bay, or jurisdiction over water quality and/or boating, met periodically to discuss vessel management, mooring, and water quality concerns for Tomales Bay. In reviewing existing information, the collaborating agencies recognized that vessels and associated facilities have the potential to impact the water quality, public health and safety, and wildlife and habitats of Tomales Bay. The agencies reactivated a Vessel Mooring Committee in 2002. The participating agencies included: California Coastal Commission (CCC), California Department of Boating and Waterways (DBW), California Department of Fish and Game (DFG), California Department of Public Health (CDPH), California State Lands Commission (SLC), California State Parks (CSP), County of Marin, National Park Service –Golden Gate National Recreation Area (GGNRA), the National Oceanic and Atmospheric Administration (NOAA) –Gulf of the Farallones National Marine Sanctuary (GFNMS), National Park Service –Point Reyes National Seashore (PRNS), the San Francisco Bay Regional Water Quality Control Board (SF RWQCB), and the Marin County Sheriff’s Department, and initially, the U.S. Coast Guard. Hereafter, these agencies are referred to as “the participating agencies.”

Over time, the concerns of the Committee evolved from focusing on vessel sewage discharge, impacts from moorings, and derelict or deserted vessels, to include introduction of invasive species, disturbance of wildlife, and discharges of oil, fuel, and vessel maintenance products. The participating agencies determined that they should act

in a coordinated manner to address all of these vessel-related management issues as well as consider vessel storage needs in Tomales Bay. The mandates of the agencies involved include preventing degradation of and restoring water quality, protecting wildlife and natural habitat, protecting public health and safety in Tomales Bay, and providing opportunities for recreation and ocean-dependent commercial uses of the Bay. Agency actions regarding the management of vessel operations and moorings, therefore, need to address all of the participating agency mandates.

### **About this Document**

This document describes current actions being implemented by the participating agencies and suggests additional strategies for the protection of Tomales Bay. The current actions described have had prior opportunities for public review and comment through the regulatory, planning, and review processes of the individual agencies responsible for those actions. For example, the GFNMS has been implementing a Joint Management Plan Review in conjunction with two other National Marine Sanctuaries- the Cordell Bank National Marine Sanctuary and the Monterey Bay National Marine Sanctuary.

During the last six years, the GFNMS has been involved in an extensive public review process to update the Sanctuary's Management Plan. In 2001, the Sanctuary more than a dozen scoping meetings and received thousands of comments. Based on public comment, the Sanctuary initiated 5 work groups to develop management strategies and propose regulatory changes to the GFNMS. The Draft Management Plans, Proposed Rules and Draft Environmental Impact Statement were released to the public in October 2006 for a 90 day public comment period and the Sanctuary held several public hearings. The documents included proposed prohibitions on deserting vessels or leaving harmful matter on deserted vessels in Tomales Bay, introducing non-native species into the Bay, designations of seagrass protection areas, a prohibition on anchoring in seagrass protection areas.

Currently, these Sanctuaries are preparing a Final Management Plan. The Sanctuary is not requesting additional public input on the draft management plan or proposed regulations. For more information about the Joint Management Plan, see <http://sanctuaries.noaa.gov/jointplan/welcome.html>.

By issuing this document, the participating agencies seek to engage the public in developing additional strategies to accomplish the goals of ecosystem and public protection articulated in the document. The document contains suggested strategies as a starting point for dialogue. During the 60-day comment period, the participating agencies hope to gather feedback on the suggested strategies as well as new ideas for addressing issues raised in this document.

### **Management Issues Considered**

1. Vessel-related discharge impacts water quality

The SF RWQCB monitoring results for fecal coliform bacteria (a commonly used indicator of human pathogenetic organisms) in Tomales Bay and its main tributaries (Lagunitas, Walker, and Olema Creeks) exceeded bacteria water quality objectives for shellfish harvesting and recreational waters. Tomales Bay is currently on the Section 303(d) Clean Water Act list of impaired waterbodies. The SF RWQCB established a Total Maximum Daily Load (TMDL) for pathogens in Tomales Bay issued in September 2005 (see Appendix #2). Vessels can be a source of the fecal coliform bacteria (the pathogen indicator applied to the TMDL) that impair the Bay's water quality. Discharges of fuel, oil, and vessel maintenance products from vessels can also impair water quality.

## 2. Vessel Moorings Alter the Seabed

In 1981, when the GFNMS was designated, Sanctuary regulations prohibited disturbance to the seabed, which includes the placement of moorings. Moorings installed in Tomales Bay after 1981, except those used for mariculture, are illegal. Surveys of moorings in Tomales Bay conducted between 2002 and 2006 showed that most of the 178 moorings in the Bay are constructed of materials such as cement blocks, old engines, tires, steel drums, treated wood posts, and other materials. Many of the moorings are poorly constructed and displace natural habitat on the seafloor. NOAA's National Marine Sanctuary Program has developed a mooring design and approved technologies that ensure moorings sink into the seabed with a small "footprint" on the surface and minimal seabed disturbance.

Improperly constructed moorings or improperly anchored vessels can threaten human health and safety by obstructing navigation channels or damaging other vessels. Moorings and improperly anchored vessels can disrupt the marine ecosystem by destroying seagrass beds that trap sediment and provide important wildlife habitat in the Bay. Mooring materials may also contribute to the degradation of the marine ecosystem if the materials contain harmful substances or are not retrievable.

## 3. Derelict and Abandoned Vessels Threaten Safety, Property, and the Environment

Derelict or deserted vessels that drift into other vessels, marina docks, or other structures can cause damage to property and other vessels. Vessels that come aground or sink can damage sensitive ecological resources. If left onboard, oil, fuel, or toxic products pose a potential threat of release.

## 4. Vessels Disturb Sensitive Wildlife and Introduce Invasive Species

Operation of vessels can disturb marine wildlife, such as feeding gray whales and seabirds and resting harbor seals, or on-shore wildlife, such as elk, deer, raccoons and shorebirds. Vessels can introduce non-native and often invasive species into a waterbody through water carried in bait buckets and discharged from the bilge.

## **Goals and Objectives**

After discussing agency mandates and the above vessel management issues, the participating agencies developed a set of goals and objectives related to vessel use in Tomales Bay that represent the collective agency mandates to protect public health and

ecological resources in Tomales Bay. Mandates ranging from the SF RWQCB's Tomales Bay Watershed Pathogens TMDL requirement to achieve zero discharge of human waste; to the GFNMS regulations to protect seagrass, prohibit alterations to the seabed, prevent invasive species introduction, and prohibit derelict vessels; to the NPS's mandate to prevent harassment of wildlife; the CDPH mandate to protect shellfish; and CDFG's authority to protect water quality for fish and wildlife were some of the drivers that brought about the objectives developed by the participating agencies. These objectives include the following:

1. Protect public health and improve water quality by:

- preventing the improper discharge of vessel-related sewage ;
- preventing the discharge of oil, gas, and toxics including vessel maintenance products;
- addressing vessel desertion and abandonment of harmful matter aboard a deserted vessel;
- removing abandoned or deserted vessels;
- providing adequate facilities for proper sewage disposal; and
- reducing closures of commercial shellfish harvest .

2. Protect habitat and decrease threats to and disturbance of wildlife by:

- exploring the use of permitted moorings and vessel storage options that avoid seagrass beds, seal haul-out areas, and mariculture lease areas;
- preventing the introduction of invasive species;
- preventing anchoring in seagrass protection areas;
- removing and preventing illegally and improperly placed moorings and mooring materials; and
- preventing and removing grounded, derelict, and deserted vessels.

3. Ensure safe and enjoyable water-related recreation by:

- removing and preventing illegally and improperly placed moorings and mooring materials in areas where there is a high concentration of recreation, such as, swimming beaches; and
- removing and preventing grounded, derelict, and deserted vessels.

### **Current Agency Actions**

The following agency actions currently being implemented to accomplish the above goals include:

1. Removal of abandoned and derelict vessels

With the assistance of grant funding from DBW, the Marin County Sheriff's Department is removing abandoned and derelict vessels. The Department is authorized to take such

action pursuant to the California Harbors and Navigation Code, section 526. The Gulf of the Farallones is assisting the Sheriff's Department with the removal of abandoned and derelict vessels that have sunk.

#### 1. Removal of illegal moorings

Based on Sanctuary regulations that prohibit altering the seabed, the GFNMS has begun removing abandoned moorings (i.e. moorings that do not have floats attached). The current authority for this action is found at 15CFR922.82(ii).

#### 2. Creation of seagrass protection zones and prohibition on anchoring in these zones

NOAA issued a proposed rule for the GFNMS on October 6, 2006 that includes creation of seagrass protection zones in Tomales Bay and a prohibition on anchoring within these zones. The rule is proposed in Federal Register Vol. 71, No. 194.

#### 3. Preventing the introduction of invasive species into Tomales Bay

NOAA issued a proposed rule for the GFNMS on October 6, 2006 that would prevent the introduction of non-native species into Tomales Bay, with exceptions for striped bass released during catch and release activities and species cultivated pursuant to existing mariculture leases. The rule is proposed in Federal Register Vol. 71, No. 194.

Various state and federal regulations prohibit the introduction of invasive species into California waterways, including Executive Order 13112, February 1999; the Non-Native Invasive Species Act of 1996; 50CFR58976; SB 497 signed into California law in 2006, the California Marine Invasive Species Act of 2003, AB 703 (signed into California law in 1999), and various provisions of the California Fish and Game Code and Public Resources Code.

### **Potential Agency Actions**

This document describes potential vessel management actions. The agencies are introducing these potential actions as a starting point for discussion with the community and interested parties to gain feedback, and determine if there are other suggested management options that will accomplish agency mandates.

Potential actions identified in this document include the following:

1. Minimizing vessel sewage discharges to the Bay by:
  - gathering information about future trends in the number, type, and location of vessels and in order to plan for and determine the appropriate number, type and location of sewage waste discharge facilities for the Bay;
  - encouraging the state to develop standards for the appropriate capacity of sewage disposal facilities in the region;

- supporting the construction of sewage waste discharge facilities;
  - ensuring that occupied vessels demonstrate capability of managing sewage on-board and preventing overboard discharge (i.e. holding tank installed);
  - designating Tomales Bay as a federal no-discharge zone; and
  - implementing a boater education effort that encourages best practices for sewage management.
2. Implementing mooring options and boat storage alternatives that protect Bay water quality, wildlife habitat, public health, and recreational opportunities. The GFNMS has begun removing abandoned moorings and is planning to remove all illegal moorings (all moorings, except those used for mariculture, installed after GFNMS designation in 1981). The agencies recognize the importance of mooring opportunities for recreation in the Bay. Therefore, community input is requested to develop options for mooring and boat storage. Some preliminary options include:
- developing mooring fields, (two options presented in the document include a Lawson’s Landing site and a Marshall Boat Works / Reynolds site);
  - creating an option for individual mooring permits and installations considered on a case by case basis (there are five agencies that would need to review each permit); and
  - increasing storage options at convenient points of access to the Bay.

Specific mooring criteria for the protection of water quality, wildlife, natural resources, public health and safety, and recreational opportunities are contained in this document. In terms of water quality, there are protections (buffer zones) for active mariculture lease operations and swimming beaches. To protect wildlife and sensitive habitat, there are buffer zones around seal haul-out areas and seagrass beds, and marshes and mudflats (depth restrictions). In order to protect recreation and public safety, moorings are excluded from navigation channels and a buffer zone for boat launch ramps is recommended.

3. Initiate an education and outreach program about:
- vessel registration;
  - seagrass protection;
  - habitat and wildlife protection;
  - preventing introduction of invasive species;
  - abandoned vessel prohibitions; and
  - preventing discharges of oil, fuel and toxic vessel maintenance products.

### **Process to Develop a Plan for Vessel Management in Tomales Bay**

There is a sixty-day comment period from the date of publication of this document. Two “brainstorming” workshops will be conducted for the Tomales Bay community in order to gather in-person and share ideas. Once public comment is gathered and synthesized, the agencies will report back to the community on the findings from the workshops and

written comments. Based on the public input, the agencies may establish a public working group to help develop a draft plan for vessel management in Tomales Bay. Whatever agency actions are contained in the draft plan for vessel management in Tomales Bay, a determination will need to be made as to whether it is a state action subject to the California Environmental Quality Act (CEQA) or a federal action subject to the National Environmental Policy Act (NEPA). Any agency proposing an action will be required to prepare the appropriate environmental analysis and conduct the appropriate public review pursuant to CEQA and NEPA.

## I. INTRODUCTION

The Tomales Bay watershed is remarkable for its serene scenic beauty, abundant wildlife, and low density of human population. The region is home to 900 species of plants, 490 bird species, and thousands of invertebrate species. Brown Pelicans, Coho Salmon, Steelhead Trout, Tidewater Goby, Red Legged Frogs, Western Snowy Plover, Northern Spotted Owl, Stellar Sea Lion, and Point Reyes Jumping Mouse are among the many threatened and endangered species found in the Tomales Bay watershed. Several species of marine mammals have been documented in the Bay, including a resident harbor seal population. The Bay supports a diversity of habitats, including seagrass beds, intertidal sandflats, mudflats, and salt and freshwater nurseries.

The resident population in the nine towns within the Tomales Bay watershed includes 11,000 people. Past and present human impacts threaten water quality, habitat, and the diversity of marine and terrestrial species. Historic human activity includes mining, logging, ranching, and agriculture that have contributed to contamination and sedimentation of the Bay. Today, human activity continues to impact the Bay.

Though the community has significantly slowed development in western Marin County, a local economy that includes tourism, agriculture, mariculture, and commercial and recreational fisheries continues to impact the ecology of the Bay. The local economy is dependant on the viability of local natural resources as residents' livelihoods mainly rely on agriculture-based production and coastally dependent, recreation-oriented uses of the area. The local economy provides the accommodations and services to support hiking, biking, kayaking, fishing, bird-watching and other forms of tourism for over 2 million visitors each year. Abundant wildlife, scenic beauty, and outdoor recreational opportunities make the Tomales Bay region a popular tourist destination and a favorite escape for urban Bay Area residents.

Beginning in 1994, a group of local, state, and federal agencies with jurisdiction over various parts of the Bay, water quality, and boating, met periodically to discuss vessel management, moorings, and water quality concerns for Tomales Bay. In reviewing existing information, the collaborating agencies recognized that vessels and associated facilities have the potential to impact the water quality, public health and safety, and wildlife and natural habitats of Tomales Bay. The participating agencies reactivated a Vessel Mooring Committee in 2002.

Over time, the concerns of the participating agencies evolved from focusing on vessel sewage discharge, impacts from moorings, and derelict or deserted vessels, to include introduction of invasive species, disturbance to wildlife, and discharges of oil, fuel, and vessel maintenance products. The participating agencies determined that they should act in a coordinated manner to address all of these vessel-related management issues including the consideration of vessel storage needs in Tomales Bay.

The mandates of the agencies involved include maintaining and/or improving water quality, maintaining and/or improving native wildlife populations and natural habitats, protecting public health and safety, and providing opportunities for recreation and ocean-dependent commercial uses. Agency actions regarding the management of vessel operations and moorings must address these concerns.

This document describes current actions being implemented by the participating agencies and suggests additional strategies to consider for the protection of Tomales Bay. Current agency actions have had prior public review and comment through the planning, regulatory, and review processes of the individual agencies.

By issuing this document, the participating agencies seek to engage public input in the development of additional strategies to accomplish agency goals of ecosystem and public protection in Tomales Bay. The document contains suggested strategies as a starting point for dialogue. During the sixty-day comment period, the participating agencies hope to gather feedback on the suggested strategies as well as new ideas for addressing vessel-related issues in Tomales Bay.

## II. GOALS, OBJECTIVES, DEFINITIONS, AND PROCESS

### A. Goals and Objectives

This planning process for Tomales Bay is intended to improve the water quality and wildlife habitat of Tomales Bay while taking into consideration human activities associated with water-related recreation, navigation and commercial fishing. It is part of a multi-agency effort to streamline and coordinate vessel management activities for the benefit of the public. After discussing agency mandates and the above vessel management issues, the participating agencies developed a set of goals and objectives related to vessel use in Tomales Bay that represent the collective agency mandates to protect public health and ecological resources in Tomales Bay. Some of the regulatory mandates that are factors in identifying goals and objectives include:

- the SF RWQCB's Tomales Bay Watershed Pathogens TMDL requirement to achieve a level of zero pathogens in the water thereby prohibiting discharge of human waste;
- GFNMS regulations to protect seagrass, prohibit alterations to the seabed, prevent invasive species introduction, and prohibit derelict vessels;
- the NPS's mandate to prevent harassment of wildlife;
- the CDPH mandate to protect shellfish; and
- the CDFG's authority to protect water quality for fish and wildlife.

The goals and objectives developed by the participating agencies are the following:

1. Protect public health and improve water quality by:
  - preventing the improper discharge of vessel-related sewage
  - preventing the discharge of oil, gas, and toxics including vessel maintenance products
  - addressing vessel desertion and abandonment of harmful matter aboard a deserted vessel
  - removing abandoned or deserted vessels
  - providing adequate facilities for proper sewage disposal
  - protecting shellfish from overboard discharge of sewage from vessels
  - protecting seagrass beds
2. Protect habitat and decrease threats to and disturbance of wildlife by:
  - exploring the use of permitted moorings and vessel storage options that avoid seagrass beds, seal haul-out areas, and mariculture lease areas
  - preventing the introduction of invasive species
  - preventing anchoring in seagrass protection areas
  - removing and preventing illegally and improperly placed moorings and mooring materials

- preventing and removing grounded, derelict, and deserted vessels
3. Ensure safe and enjoyable water-related recreation by:
- removing and preventing illegally and improperly placed moorings and mooring materials in areas where there is a high concentration of recreation, such as, swimming beaches
  - removing and preventing grounded, derelict, and deserted vessels

Plans for accomplishing these goals and objectives include current and long-term actions that will be determined through a public input process.

## **B. Definitions**

“Recreational users” are considered, for the purposes of this document, fishermen, boaters (aboard all vessels including sailboats, canoes, kayaks, and motorboats), windsurfers, and related overnight boaters at anchor-outs and on-shore campgrounds. “Fishing” includes shoreline and in-bay recreational and commercial fishing, as well as crabbing and clamming. “Mariculture” means mariculture or shellfish farming.

## **C. Process**

This document provides an overview of current actions being implemented by agencies with physical jurisdiction in Tomales Bay and those with jurisdiction over various vessel-related activities in the Bay. It provides recommendations to achieve the goals outlined in this document. It reflects a multi-agency effort to streamline and coordinate future vessel-related activities. The intended outcome of this process is to develop a final plan for vessel use in Tomales Bay. A benefit of having a coordinated, collaborative approach reflected in a plan is that the plan will provide guidance to the agencies and the public as they seek to improve the water quality, protect and restore the natural resources and ensure public health and safety of water-related uses of Tomales Bay.

This document is being released for public comment and review for 60 days. The agencies are hosting two “brainstorming” workshops during that period to seek public input and suggestions on strategies to accomplish agency mandates. These workshops will provide a venue for dialogue between the agencies and the public. Written comments will also be accepted during the 60 day review and comment period. Following the public comment period, the agencies will synthesize the comments and feedback gathered and report back to the community. Based on the public input, the agencies may establish a public working group to develop the draft plan. Once a draft plan is produced, determinations will need to be made by any agency that is responsible for an action contained in the plan as to whether or not the action is subject to CEQA or NEPA review. If so, compliance with the appropriate processes for CEQA and NEPA review will be required.

### III. ECOLOGICAL CONDITIONS OF TOMALES BAY

#### A. Physical and Geographic Conditions

The Tomales Bay watershed extends from Mount Tamalpais and Bolinas Ridge, east to the headwaters of Walker, Nicasio and Lagunitas Creeks, and west to the Inverness Ridge. The lands of the watershed include privately owned ranchlands, parklands, public water districts, and residential areas of nine towns. The watershed is rugged with the maximum elevation of 2605 feet (Mount Tamalpais) and several other peaks that exceed 984 feet. The watershed is approximately 220 square miles and encompasses nearly one quarter of the lands of Marin County.

Tomales Bay is a shallow, highly unidirectional, Mediterranean-type, coastal estuary, alternating between a classical estuary (net dilutive basin) during the wet winter and a hyper saline estuary (net evaporative basin) during the dry summer (see Figure 1). Tomales Bay opens at the southern end of Bodega Bay and extends in a southeasterly direction. The Bay is approximately 12 miles long and less than one mile wide with an area at mean low water of 10.9 square miles (28.4 square kilometers). The average depth is approximately 12 feet (3.7 meters) at sea level; its greatest depth is 61 feet with a total volume of  $48 \times 10^6$  cubic meters. (Tomales Bay Watershed Council, 2003).

Figure 1: Map of Tomales



## **B. Bay Wildlife and Ecology**

The Bay is a significant biological community that supports a diversity of habitats, including; eelgrass beds, intertidal sand and mud flats, and salt and freshwater marshes. Large subtidal meadows of eelgrass grow in the northern half of Tomales Bay between Pelican Point and Tom's Point where temperatures, salinities, and tidal exchange resemble those in the Pacific.

Thousands of species of birds, invertebrates and plants, and numerous threatened and endangered species inhabit the watershed, such as Brown Pelicans, Coho Salmon, Steelhead Trout, Red-legged Frogs, Western Snowy Plover, Northern Spotted Owl, Tidewater Goby, Steller Sea Lions, and the Point Reyes Jumping Mouse. The watershed is especially important to approximately 20,000 wintering shorebird, seabirds, and waterbirds, among many other bird species that occur both seasonally and year-round (Kelly, 1998). The waters of the Bay are also important to many fish species, including salmon, eels, sturgeon, halibut, endangered Coho Salmon, and the commercially important Pacific Herring that rely on its creeks and extensive eelgrass beds to spawn.

Several species of marine mammals have been documented in the Bay and there is a resident harbor seal population that breeds there. The seal population ranges between 500 and 800 seals depending on the time of year. Monitoring data from Tomales Point have shown that motor vessels, recreational clammers, and kayakers have flushed seals and seabirds.

## **C. Seagrass Habitat**

Tomales Bay is one of the most ecologically significant estuarine areas in the State of California. The Bay provides critical habitat for numerous species listed under the Endangered Species Act and the Marine Mammal Protection Act. Seagrass and red algae (*Gracilaria spp.*), cover approximately 1.5 square miles or 13% of Tomales Bay. Other habitats found here include intertidal mudflats, subtidal channels, salt marsh and upland marsh.

The seagrass species found in Tomales Bay is *Zostera marina*, commonly called eelgrass. Eelgrass provides important habitat for Bay Pipefish, Shiner Perch, Arrow Goby, Northern Anchovy, California Halibut, Pacific Staghorn Sculpin, Coho Salmon, Steelhead Trout, and Pacific Herring and other fish in Tomales Bay. It has been designated as an Essential Fish Habitat under the Magnuson-Stevens Fishery Conservation Management Act. There are ten to 100 times more animals in eelgrass beds compared to adjacent sandy or muddy habitats (Hemming and Duarte 2000). Food for fish, including plants, algae, invertebrate species, detritus, is abundant. Eelgrass provides protection from predation by bigger fish and birds. Some species of fish use eelgrass beds for their spawning grounds, including the commercially important Pacific herring, which relies on abundant eelgrass beds to support its roe. Eelgrass beds also serve as a nursery

ground, providing a safer place for larvae and juvenile fish to feed and grow (Heck et al 1989).

Eelgrass beds help to support a huge population of birds. It is estimated that 20,000 shorebirds and 25,000 waterfowl use the eelgrass beds and adjacent areas in Tomales Bay for their feeding ground. Some of these bird species include Black Brandts, Black Scoter, Greater Scaup, Great Blue Heron, Black Brant, Marbled Godwit, Western Sandpiper, Dunlin, and Willet. They feed on eelgrass, fishes, and invertebrates. Tomales Bay eelgrass beds provide migratory feeding and resting stops for Black Brant that travel between the Arctic tundra of Alaska, Russia and Canada in a 3000 mile range over the Pacific Ocean to wintering grounds in the estuaries and lagoons of Southern British Columbia, the United States and Mexico (Derksen et al 1998).

In addition to supporting fish and birds, eelgrass sustains other species that rely on detritus, algae and other food resources available in eelgrass beds. Invertebrate species such as clams, shrimp, snails, nudibranchs, amphipods, worms, and bryozoans consume tiny algae that grow on eelgrass blades, and filter detritus and phytoplankton from the water. In turn, these animals provide food for many other animals that live and/or feed in eelgrass beds. It is estimated that approximately 20 species of commercially valuable species feed in eelgrass beds at some point in their lives, including Dungeness crabs, rockfish, salmon and Pacific herring (Sea Grant Fact Sheet).

Eelgrass provides many ecosystem services beyond providing habitat and food for animals. It improves water quality along the coast by trapping sediments and nutrients. An acre of healthy seagrass can absorb approximately 6 pounds of nutrients per year, the equivalent of treated effluent from 490 people. With less nutrients available in the water column, phytoplankton are less likely to multiply rapidly, thereby reducing algal blooms that can degrade water quality. Eelgrass helps to prevent shoreline erosion by reducing the impacts of wave energy and storms. Eelgrass also sequesters carbon; one acre of eelgrass sequesters 7,401 pounds of carbon per year, which equals the CO<sub>2</sub> emissions from an automobile that has traveled 3,860 miles (Duarte et al 2005).

Although healthy eelgrass meadows can provide many ecosystem services, it is not immune to the increasing pressure from human activities. Because it needs sunlight to survive, eelgrass only occurs in shallow waters along the coast, and water clarity is essential for its survival. Unfortunately, coastal areas are subjected to increasing sediment and nutrient runoff from fertilized lawns and farms, sewage, and land development, as well as physical disturbances (dredging and damage from boating activities), invasive species, disease, and algal blooms (Orth et al 2006). In the 1930s, over 90% of the North Atlantic eelgrass meadows died off when a combination of abnormally warm ocean currents and a fungal disease hit the coast. The death of the eelgrass led to the disappearance of many species of ducks and geese, and the stocks of crabs, clams, scallops, and lobsters severely declined. In addition, coastal erosion became a problem (Rasmussen 1977). This event demonstrated the importance of eelgrass for healthy marine ecosystems.

Studies in other parts of the world have found that vessel propellers, anchors and moorings can damage the underground root and rhizome system of eelgrass, which can have long-term impacts on the health of the eelgrass community (Milazzo, M., et al, 2002; Walker et al., 1989; Kentworthy et al, 2006)). Recovery rates from vessel-related damage are not well-documented for eelgrass. There have been efforts underway to restore several different species of seagrass in the Chesapeake Bay for several years with very poor results - less than 10% of the transplant sites have had long-term survival. A recent effort to restore eelgrass beds in San Francisco Bay has had little to no success, most likely due to deteriorating conditions in the Bay. Based on the damage that can occur and the low success of restoration efforts to date, the participating agencies determined that mooring and anchoring in eelgrass beds should be avoided. DFG surveys in 1992, 2000, 2001, and 2002 have been used by GFNMS to identify the locations of eelgrass beds and to propose areas to be protected from anchoring and mooring.

#### **IV. HUMAN AND VESSEL-RELATED ACTIVITIES IN TOMALES BAY**

Humans and nature have co-existed in the Tomales Bay watershed for at least 5,000 years, and perhaps as long as 13,000 years, since the time of the coastal Miwok. Uses of the watershed have significantly changed in the last 400 years since the arrival of European settlers to the area. The watershed now supplies water, provides recreational opportunities, supports cattle (dairy and beef) and sheep ranching, farming, commercial fisheries, and oyster production. Tourism is an important part of the local economy, with over 2 million visitors annually coming to explore the beautiful parklands and beaches of this watershed.

Much of the western and southern portions of the watershed are under public ownership, and include parklands of the Point Reyes National Seashore (PRNS), the Golden Gate National Recreation Area (GGNRA), Marin County Parks and Open Space, Tomales Bay State Park and Samuel P. Taylor State Park, as well as lands of the Marin Municipal Water District and Inverness Public Utility District. Most of the northern and eastern areas are privately owned agricultural lands.

##### **A. Land Use**

This watershed is characterized by abundant open space and preservation of agricultural lands. A human population of approximately 11,000 inhabits nine towns throughout the watershed, with less than 1% of the area developed into towns and roads (National Park Service 2001). The open space is attributable mainly to rezoning that took place between 1972 and 1975 when the number of potential building sites was reduced from 1.2 million to 3,000 (Tomales Bay Watershed Council, 2003). Two-thirds of the land in the watershed is currently zoned A-60, thereby creating a 60-acre minimum parcel size for agricultural lands identified in the Marin County Master Plan. The preservation of open space is also attributable to the creation of the PPNRS and the GGNRA and a variety of State and County parks in the watershed.

##### **B. Water Supply**

Water supply comes from groundwater, as well as springs and surface water. There are approximately 7,000 septic systems in Marin County, but the County has not yet determined the number and location of septic systems in the Tomales Bay watershed (Tomales Bay Watershed Council, 2003). There is information for approximately half the septic systems in the watershed, particularly for those constructed since new septic regulations were adopted in 1984. Based on the report of the Tomales Bay Watershed Council in 2003, there were 212 septic parcels within 100 feet of the Bay or a creek on the west shore, and 186 on the east shore. There were 808 septic parcels within 100 feet of a creek or reservoir in the Lagunitas Creek watershed including Olema Valley, and 100 within the Walker Creek watershed. Many of the septic systems on these parcels are immediately adjacent to water bodies while others are hundreds of yards away. In addition, there are nine sewage treatment systems in the Tomales Bay watershed. These are regulated by the SF RWQCB through its waste discharge permitting system. The

methods for waste treatment at these facilities vary from digesters with primary and secondary treatment to holding ponds and subsequent spreading of treatment by-products (Tomales Bay Watershed Council, 2003).

### C. Mariculture

Mariculture activities in Tomales Bay annually produce about 20 percent of California's commercial oyster crop (California State Parks, 2004). There are six companies certified to sell shellfish in California that have mariculture leases in Tomales Bay. These leaseholders include: the the Bernal Brothers (1 lease, 62 acres), the Cove Mussel Company (1 lease, 10 acres), and the Hog Island Oyster Company (4 leases, 134 acres), Marin Oyster Company (2 leases, 30 acres), the Pt. Reyes Oyster Company (3 leases, 92 acres), and Tomales Bay Shellfish farms (1 lease, 156 acres). There are currently 484 acres in use for mariculture in Tomales Bay (CDPH).

The primary species of shellfish cultivated in Tomales Bay include European (*Ostrea edulis*), Eastern (*Crassostrea virginica*), Pacific (*Crassostrea gigas*), Kumomoto (*Crassastria sikamea*), and Flat Oysters; Manila Clams (*Tapes semidecussata*) and Littleneck Clams, and Blue and Bay Mussels. In 2005 in Tomales Bay, the production yields from mariculture were as follows:

<b>Species</b>	<b>Weight (pounds)</b>	<b>Value (dollars)</b>
Pacific Oyster	474,484	3,566,128
Eastern	7,511	41,299
European	965	5,306
Kumomoto	3,579	96,620
Manila Clam	7,366	31,306
Mussel	<u>9,760</u>	<u>29,280</u>
<b>TOTAL:</b>	<b>503,665</b>	<b>3,769,939</b>

The total weight of production in 2005 was 503,665 pounds and the total value of the shellfish cultivated in Tomales Bay was \$3,769,939. Approved mariculture methods in lease agreements include longline, rafts, rack and bag, longline on stakes, rack and tray, groundline and bag, bottom culture, floats, and modified stakes (DFG).

The shellfish growing areas of Tomales Bay have been given conditional approval by DHS due to concerns over microbial contamination. The purpose of the conditionally approved classification is to provide a mechanism for the declaration of harvest closures during periods when the growing areas does not meet National Shellfish Sanitation Program (NSSP) standards for harvesting shellfish for direct marketing for human consumption. In Tomales Bay these periods when harvesting shellfish are suspended occur during significant rainfall events (0.4 inches to 0.5 inches) within a 24-hour period. In the winter months, harvest and sales of shellfish can be restricted for prolonged periods. In 1993 the Shellfish Protection Act was created by the State in an attempt to improve water quality by mandating the creation of a Tomales Bay Shellfish TAC to assess water quality issues, and to develop recommendations to effect water quality improvements.

#### **D. Commercial and Recreational Fisheries**

Tomales Bay once supported large Coho Salmon and Steelhead Trout fisheries. These fisheries are completely closed as a result of listing under the Endangered Species Act. Steep declines have been noted in the populations of White Sea Bass, Striped Bass, Starry Flounder, Diamond Turbot, Pacific Sardine, and Pacific Littleneck clams. The primary commercial fishery in Tomales Bay is Pacific Herring. This fishery is directed almost exclusively to supporting the the Japanese herring roe market. The herring fishery allows a limited-entry gillnet program that targets egg-bearing females as they congregate to spawn. Smaller commercial fisheries in Tomales Bay include Halibut, Perch and live-bait.

Recreational fishing in Tomales Bay attracts those seeking Halibut, clams, Dungeness and Rock Crabs, Jacksmelt, Perch, Sole, Striped Bass, Sturgeon, Sharks and Rays. In 2000, Marin County issued a health advisory that recommended low consumption levels for sport-caught halibut, perch, smelt, sharks and rays because of detected mercury levels (Tomales Bay Watershed Council, 2003).

#### **E. Water-based Recreation in Tomales Bay**

There is no definitive, scientific data documenting the volume or extent of water-based recreational uses in Tomales Bay. Pleasure and fishing vessels are found distributed throughout the Bay. Boating activities have increased in recent years with large numbers of kayakers now using the Bay. The information in this section is taken exclusively from a County-commissioned study of water-related recreational uses in Tomales Bay (Prunuske-Chatham, 2003).

PRNS has a limit of 7,200 vessel-in overnight camping permits per year and collects information on visitors who camp overnight on the west side of Tomales Bay in the PRNS. This data is limited to the number of camping permits issued at launch sites around the Bay and includes public and private areas. Two of the major factors affecting overnight use by kayakers have been PNRS establishment of camping use permits and limitation of the numbers allowed to camp at any given time. Day use is more difficult to determine since there are so many entry points around the Bay that are accessible to kayakers.

The California Department of Parks and Recreation also tracks the number of visitors to Tomales State Park. There is an estimated total annual visitation of 124,000 visitors to all units within the park. The water-based recreational usage varies among shoreline locations at the Park. The term “water-based recreation” covers beach use, swimming, and launching of kayaks and other light vessels without motors. These counts are based on cars at parking lots at a particular time multiplied by a factor that reflects the number of passengers. Shell Beaches 1 & 2 and Hearts Desire Beach are the most popular. During the summer, an average of 60 kayaks are launched every Saturday and Sunday with 20 to 25 launched every weekday at Hearts Desire Beach. Private use has steadily increased while commercial kayaking, which peaked about three years ago, has declined.

## F. Vessel Access and Usage

Marin County maintains a concrete vessel launch ramp on Tomales Bay at Miller County Park. Although no accurate numbers are collected, this facility is likely used by motor-driven vessels, mostly 20 feet and under in length, as well as others with sailboats and kayaks.

According to the California Department of Public Health (CDPH), the number of vessels using the launching facilities at Miller County Park has more than doubled since 1995 when 2,300 vessels were reported to have used the launch site (CDPH, 2002, actual figures based on personal communication with Marin County by CDHS). In 2001, 6,000 vessels were recorded by October. July was the busiest month at the Park for vessel launches. This information was obtained from Marin County by CDPH, but it is not known how the vessel numbers were derived since the Marin County Parks provided only car estimates for this report.

Commercial kayak companies that regularly use Tomales Bay include Blue Water Kayaking, Tamal Saka Kayakers, and Sea Trek. There is a mixed level of data recorded by each company on the use, destinations, and number of kayakers using their services. Tamal Saka rents kayaks on a daily basis, while Sea Trek primarily focuses on guided overnight trips to the Bay. Kayakers have numerous destinations around Tomales Bay.

In addition to recreational uses, there may be a few seasonal-use live aboard vessels moored in the Bay and only one marina, The Golden Hinde. Tomales Bay supports a commercial Herring fishery and shellfish mariculture operations. Herring fishing occurs for a short time during the annual herring run. In 2006, DFG issued 35 limited entry gillnet permits for the fishery. The quota for Tomales Bay in 2006 was 350 tons. The season runs annually from late December through the end of February. DFG permits herring nets to be set in seagrass beds. The authorizing statute is the Fish and Game Code, sections 8550-8559, and regulations are set forth in Title 14 of the California Code of Regulations, section 163.

## G. Number of Vessels and Vessel Facilities

A report to the California Waterboard (Waterboard, Final Report) in 2004 regarding the adequacy of sewage pumpout facilities in Tomales Bay reviewed the status of boating facilities in the Bay. The survey provided this overview of boating facilities in Tomales Bay (Figure 2). The sites consisted of four marinas, two kayak rental facilities, and eleven public access areas. The ownership of these sites was made up of PRNS, County of Marin, CSP properties and privately owned properties as shown below.

**Figure 2: Boating Facilities in Tomales Bay**

Identified Sites	Type of Facility	Ownership
Marshall Vessel Works	Marina	Private
Lawson's Landing	Marina	Private

Tamal Saka Kayak Rentals	Kayak rental	Private
Inverness Yacht Club	Marina	Private
Blue Waters Kayaking	Kayak rental	Private
Golden Hind Inn & Marina	Marina	Private
Point Reyes National Seashore		Federal
1. Tomales Beach	Public access	“
2. Laird’s Landing	Public access	“
3. Marshall Beach	Public access	“
4. Sacramento Landing	Public access	“
County of Marin		County
1. White House Pool	Public access	“
2. Chicken Ranch Beach	Public access	“
3. Miller Park Public Fishing Access	Public access	“
Tomales Bay State Park		State
1. Hearts Desire Beach	Public access	“
2. Indian Beach	Public access	“
3. Millerton Point	Public access	“
4. Marconi Cove (future site)	Public access	“

In addition, the survey relied on an aerial survey (conducted on Saturday, September 6, 2003, between approximately 1:00 – 2:00 pm) of the Tomales Bay waters to gather additional information on the number and size of vessels in Tomales Bay. The aerial survey resulted in a total vessel count of 449 vessels. This count included those vessels in the water, or on the immediate shoreline of Tomales Bay. Of these vessels, there were 146 power craft, 165 sail vessels, 126 human powered craft (kayaks, canoes, sculling craft) and 12 unknown vessel types.

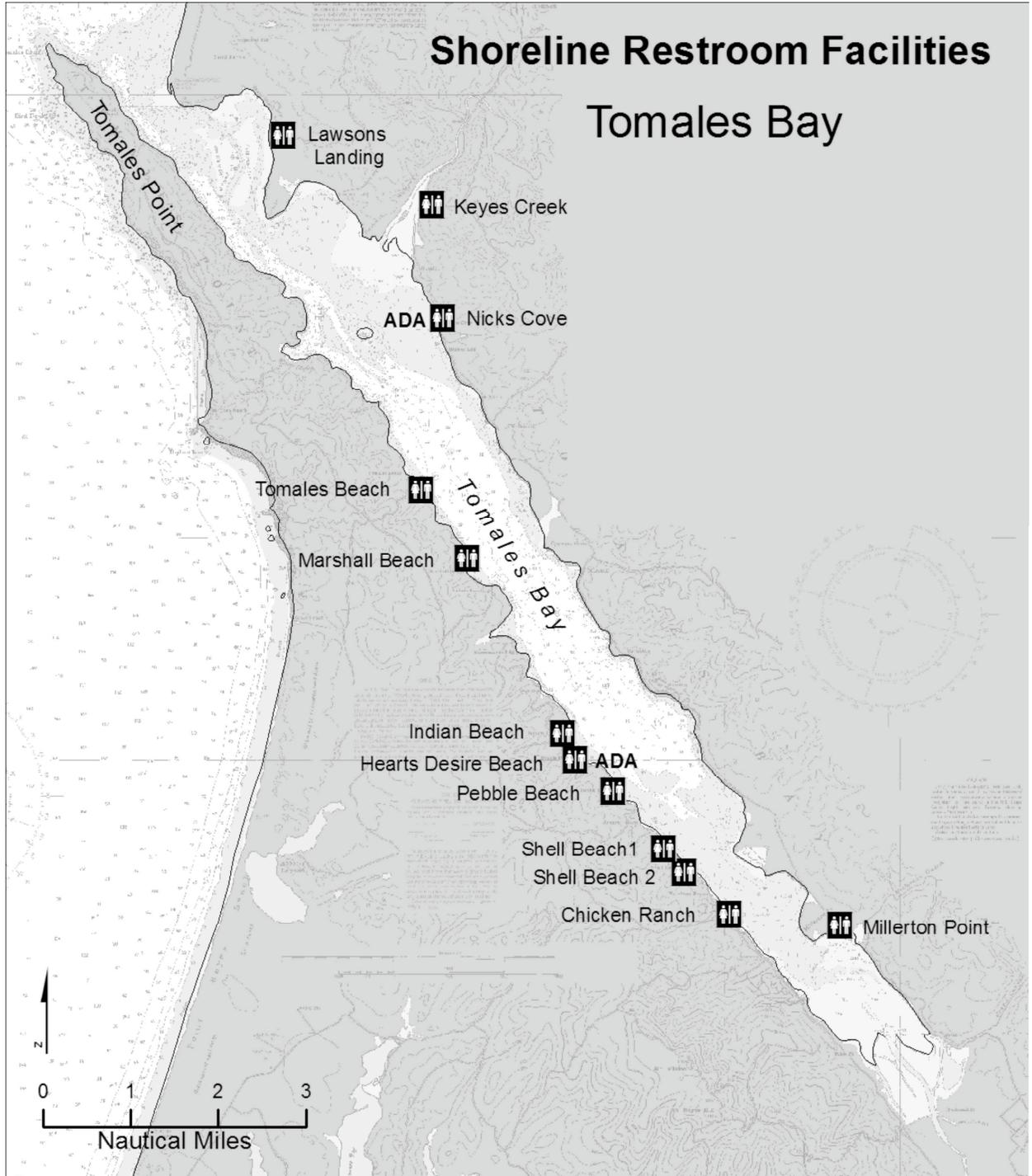
The study used this facility and vessel information to make a determination on the adequacy of public restroom facilities, sewage pumpout<sup>1</sup> and dump stations<sup>2</sup> in Tomales Bay. The public park systems (state and federal) are the major providers of toilets around the shoreline of Tomales Bay (Figure 3). Most of the shoreline facilities are within a 10 to 15-minute run by motorized vessel from any place in the Bay. All the parks maintain records of service times, facility type, and status of the toilets under their supervision. There have been no records of overflowing toilets or major problems. There appears to be an adequate number of public restroom facilities at the public access sites. The only complaint noted was that some of the facilities were of the temporary portable-john or construction site type. These temporary facilities lacked the cleanliness, low odor, and

<sup>1</sup> **Pumpout stations:** Pumpout stations are installed in marinas at convenient locations, such as an end tie dock or dedicated pumpout berthing spot for boaters, and empty the onboard holding tanks into a landside sewage system or to a municipal sewage line. These facilities consist of a pump unit with an associated suction hose and shut-off valve.

<sup>2</sup> **Dump Stations:** Dump stations are installed for the specific use of boaters to empty portable toilet units (porta-potties) carried onboard their vessels. These facilities are a dedicated piece of equipment that typically resemble a large sink basin, often equipped with a water hose to flush out the portable units.

more attractive aesthetics associated with a permanent type installation. This conclusion is consistent with an earlier County recreational study (Prunuske-Chatham, 2003).

**Figure 3- Shoreline Restroom Facilities**



There are four private marinas and one public vessel launching facility located in Tomales Bay. The DBW survey found that there are no existing public or private pumpout or dump station facilities in Tomales Bay. A dump station is being planned for the public vessel launch area in Miller Park.

## H. Number and Type of Vessel Moorings

A typical mooring consists of a permanent weight on the seafloor attached to a chain and a buoy. There are many undocumented moorings located throughout Tomales Bay with a current estimate of 178 moorings. Most of the mooring use is seasonal, and as many as 80 percent are vacant during the winter months.

NPS and NOAA conducted a survey of moorings in Tomales Bay in February 2002 to verify the depth of each mooring and ensure accurate registration information of vessels attached to any moorings. Additional mooring surveys were conducted in July 2004, October 2004 and February 2006. The agencies conducted these surveys by vessel. The surveys noted whether the mooring had a vessel attached, whether the vessel had valid registration information and whether the vessel appeared to be derelict or deserted. Staff noted in the October 2004 survey that approximately 30 of the moorings with vessels appeared to be derelict or deserted vessels and approximately 30 vessels had no visible, current California registration. The 2004 survey documented a total of approximately 165 moorings.

The 2006 survey used the same protocols as the 2004 surveys, and employed the updated technology of the hand-held GPS, which allowed staff to record the coordinates of each mooring for mapping purposes. The 2006 survey allowed agency staff to verify the number and location of moorings with and without vessels, to determine the depth of the moorings, and to indicate the derelict vessels on a map.

Vessel registration information was noted during the surveys. Many vessel owners may have registered their vessels with the Coast Guard under federal documentation rather than the State of California through the Department of Motor Vehicles. Federally documented registration is not readily visible, so additional information was obtained from each vessel that did not display a California registration.

The location of each post, buoy, or vessel was determined by GPS. The depth at each location was taken by Fathometer and any numbers, marks and/or color were recorded. Vessels that appeared to be derelict were also noted. The State of California registration number and registration year were recorded, when possible. Although most (>90%) of the vessels did not display current California registration, a few vessels may be certified by the United States Coast Guard. The number of documented vessels was not recorded, but agency staff recall that very few were documented.

The 2006 survey showed approximately 178 moorings, with concentrations in four primary mooring areas on the east side of Tomales Bay: Lawson's Landing (~36 moorings); Marshall Boatworks (~38 moorings); Reynolds Cove (~34 moorings); and Marconi (~15 moorings). On the western side of Tomales Bay, there is also a concentration of moorings in the vicinity of Teachers Beach (~13 moorings). See Figure 4 for mooring locations. The moorings were fabricated from cement blocks, old engines, tires and cement mix, steel drums, wood posts, and other materials.

## **V. GOVERNMENTAL AGENCY JURISDICTION AND REGULATION**

There are numerous local, state, and federal laws and regulations pertinent to boating and protection of natural resources and recreation in Tomales Bay. This section summarizes the various agencies that have jurisdiction in all or part of Tomales Bay. A more detailed description of agency jurisdictions and pertinent regulations is contained in Appendix #1. The public agencies primarily involved with vessel management, habitat, and water quality issues in Tomales Bay include: CCC, DBW, DFG, CDPH, SLC, CSP, GGNRA, GFNMS, PNRS, SF RWQCB, and Tomales Bay State Park, together, protect approximately 50% of the 70 miles of shoreline in Marin County and provide most of the recreational opportunities and shoreline access to Tomales Bay. This section also provides an overview of relevant laws and regulations.

### **A. California Coastal Commission (CCC)**

The CCC, in partnership with coastal cities and counties, plans and regulates the use of land and water in the coastal zone. Tomales Bay is part of the Coastal Zone and falls under Marin County's certified Local Coastal Program (LCP). The primary goal of the LCP is to ensure that the local government's land use plans, zoning ordinances, zoning district maps, and implemented actions are consistent with the provisions and polices of the California Coastal Act. The CCC retains permanent coastal permit jurisdiction over development proposed on tidelands, submerged lands, and public trust lands.

### **B. California Department of Boating and Waterways (DBW)**

DBW makes loans and provides grants to improve or enhance the public's access to waterways through the construction of vessel launching facilities and small craft harbors, recreational boating trails, coastal beach erosion control, and vessel equipment and operation (including vessel sanitation and pollution control). DBW provides grants to local government for the removal of derelict vessels.

### **C. California Department of Fish and Game (DFG)**

DFG regulates many aspects of commercial fishing including, but not limited to: fish reduction, ocean shrimp, herring and swordfish fisheries; kelp leases, oyster allotments (leases), shellfish cultivation and abalone regulations, and; mariculture operations. Fish and Game wardens are authorized to issue citations for spills or discharges of any substance(s) considered deleterious to fish and wildlife. Fish and Game staff report chronic (sublethal, long-term) water pollution conditions to RWQCBs and cooperate in obtaining corrections or abatements to the condition.

### **D. California Department of Public Health (CDPH)**

The CDPH is the lead agency (the State Shellfish Program), which certifies and regulates sanitary procedures followed in the harvesting, handling, processing, storage and distribution of bivalve molluscan shellfish intended for sale for human consumption. A

shellfish growing area Management Plan is prepared and is administered Department, in cooperation with the shellfish growers, wastewater treatment plant operators, public agencies, and the other involved parties discussed in this Plan. The Management Plan for commercial shellfish operations in Tomales Bay is developed pursuant to the National Shellfish Sanitation Program (NSSP). The Management Plan sets forth all aspects of the CDPH Shellfish Program standards and procedures used to regulate commercial shellfish harvesting in Tomales Bay.

#### **E. California State Lands Commission (SLC)**

The SLC derives its authority from both the Public Resources Code and the California Code of Regulations. Public Resources Code section 6301 grants exclusive jurisdiction to the Commission over all ungranted tidelands and submerged lands owned by the State, and the beds of navigable rivers, streams, lakes, and bays. The SLC administers this authority, including the leasing of state lands for marinas, docks, and moorings, pursuant to Title 2, Division 3, Chapter 1, California Code of Regulations.

#### **F. California State Parks (CSP)**

CSP administers and implements the State Park System. The mission of the California Department of Parks and Recreation is to provide for the health, inspiration, and education of the people of California by helping to preserve the state's extraordinary biological diversity, protecting its most valued natural and cultural resources, and creating opportunities for high-quality outdoor recreation.

#### **G. National Oceanic and Atmospheric Administration --Gulf of the Farallones National Marine Sanctuary (GFNMS)**

GFNMS has jurisdiction over most of Tomales Bay waters. Its regulations prohibit the following activities within the Sanctuary:

- Discharges or deposits of materials;
- Dredging or otherwise altering the seabed (existing moorings are considered structures that alter the seabed);
- Using motorized personal watercraft (MPWC - defined as a motorboat that is less than 16 feet in length, propelled by water jet pump, and designed to be operated by a person sitting, standing, or kneeling on the vessel rather than sitting or standing inside the vessel);
- Constructing any structure other than a navigational aid (this prohibition applies to installation of moorings in the Sanctuary).

NOAA has recently proposed new regulations that would prohibit anchoring in sea grass beds, releasing introduced species, and deserting a vessel aground, at anchor, or adrift in the Sanctuary.

Other proposed GFNMS regulations would prohibit deserting or abandoning vessels within the Sanctuary or operating a vessel in a manner that damages seagrass.

## **H. Marin County and the Marin County Sheriff's Office**

The Marin County Sheriff's Office is the primary agency within Marin County that has law enforcement authority in Tomales Bay. While primary law enforcement jurisdiction is the purview of NOAA, GFNMS, NPS, and CSP for lands within their respective park boundaries, the Sheriff's Office has authority to enforce all state and local laws within those park boundaries.

Other agencies within Marin County that have some jurisdiction over vessel-related issues in Tomales Bay include: the Marin Community Development Agency, which would permit the expansion of vessel-related facilities, and the Marin County Parks and Open Space District, which manages the Miller vessel launch ramp.

## **I. National Park Service (NPS) / Point Reyes National Seashore (PRNS) / Golden Gate National Recreation Area (GGNRA)**

The NPS has jurisdiction over a large portion of Tomales Bay through Point Reyes National Seashore (PRNS) and the Golden Gate National Recreation Area (GGNR). The Seashore has the authority to institute a permit system for vessel use within the Park and prohibit some activities. The PRNS Superintendent is also allowed to close the park to moorings, or allow them under permit, control overnight stays, and prohibit residing on federal lands or waters, except under permit. Currently, kayakers camping overnight in the Park are required to obtain a permit from the Park. The Park also has the authority to assimilate state regulations for vessel operation and registration and licensing issues; allows the NPS to enforce Coast Guard regulations on park waters and includes regulations on discharge, vessel operation, vessel requirements, and documentation. The Park also has authority to conduct enforcement of general boating rules including types of vessels, equipment, moorings; and allows rangers to board and inspect vessels in Park waters. The Park has authority to protect wildlife in Tomales Bay.

## **J. State Water Resources Control Board (California Water Board) and Regional Water Quality Control Boards (RWQCBs)**

The Water Board is charged with preserving, enhancing and restoring the quality of California's water resources, and ensuring their proper allocation and efficient use of the benefit of present and future generations. The Water Board has the ultimate authority over State water rights and water quality policy, and the regional boards oversee water quality on a day-to-day basis at the regional level by determining the beneficial uses for all water-bodies within their jurisdiction, establishing and enforcing water quality standards for surface and groundwater, and taking actions needed to maintain the standards by controlling point and non-point sources of pollution. The Shellfish Act of 1993 required that the Regional Board form a Technical Advisory Committee to investigate sources of pollution in threatened shellfish areas of Tomales Bay.

### **K. U.S. Coast Guard**

The U.S. Coast Guard is charged with enforcing regulations that prohibit dumping of plastic refuse and garbage mixed with plastic into any waters. The agency also enforces regulations regarding marine sanitation equipment that must be aboard vessels with installed toilets.

### **L. United States Environmental Protection Agency (U.S. EPA)**

EPA regulations prohibit discharges of oil, fuel and hazardous substances, contain requirements for vessel sewage discharge, and provide for the designation of federal No Discharge Zones.

### **M. Local Jurisdictions**

Local jurisdictions may have additional boating laws, rules, or ordinances. These local rules may include horsepower or speed limits, no wake zones, vessel type and size restrictions, and zoning restrictions for areas closed to boaters and designated traffic patterns.

### **N. Permitting Authority**

There are extensive overlapping jurisdictions and authorities within Tomales Bay. The CCC has permitting authority over the entire Bay and those portions of the upland areas that are in the coastal zone. The SLC has leasing authority over the state-owned tidelands and submerged lands. The GFNMS has permitting authority over certain activities in the water column up to mean high tide, including activities that alter the seabed. PNRS has jurisdiction over the west side of the Tomales Bay, extending 0.25 miles into the Bay from the shoreline and under. The GGNRA has jurisdiction along the eastern shoreline out to the PNRS boundary. If there is any construction in the tidelands, Marin County Community Development Agency requires issuance of a tidelands permit.

The DFG has authority over the management of oyster lease areas. State Parks has an administrative agreement with SLC and authority 1000 feet out from State Parks Lands. The RWQCB has permitting authority for all discharges into Tomales Bay. GFNMS has permitting authority over any discharges that do not come from a Type I or Type II MSD.

### **O. Enforcement Authority**

The primary agencies that are involved in the enforcement of county, state and/or federal regulations with respect to boating operation in Tomales Bay include the County of Marin Sheriff's Office, CSP, NPS, CCC, GFNMS and the U.S. Coast Guard. The availability of patrol officers and/or special agents to enforce the laws and regulations of Tomales Bay is limited.

The Marin County Sheriff's Office has authority to enforce county and state regulations. If a vessel is tied to a marina, the County has provisions for long-term anchored or moored vessels upon which a person or persons live and moorings. There is one boating officer for the County and if an illegal discharge is witnessed or there is a probable cause or suspicion, the officer can inspect a vessel. The County patrol vessel is usually stationed on the east side (San Francisco Bay) of the County.

The NPS has patrol vessels and operators working on Tomales Bay. CSP has one ranger on the West side of the Bay, and GFNMS has a NOAA law enforcement agent assigned to Tomales Bay. These agencies are currently working together to coordinate enforcement in Tomales Bay. The Coast Guard also has the authority to enforce regulations in Tomales Bay.

The biggest challenge for boarding or inspecting vessels for all agencies is that many of the boating laws require that a person be on board a vessel in order for it to be boarded by an enforcement officer. Many of the vessels in Tomales Bay do not have anyone on board on a regular basis. Complaints are usually responded to by the agency to which the complaint was made. The agencies are working to attempt joint patrol operations on the Bay for both "routine" and specific enforcement.

In terms of the discharge or release of pollutants or species that can have adverse effects on water quality or the overall health of the Bay, several agencies have jurisdiction and enforcement authority to stop or prevent such activities. The RWQCBs, the DFG, the U.S. Coast Guard, GFNMS, and the Marin County Sheriff's Department have various authorities related to such activities in Tomales Bay.

The CCC's enforcement tools include cease and desist and/or restoration orders and filing complaint(s) for civil penalties. Cease and desist orders are used by the Commission to halt ongoing violations, to order removal of un-permitted development, and to force developers to comply with the permit process; restoration orders are used to bring about the removal of un-permitted development and/or restoration of damaged coastal resources.

## **VI. VESSEL MANAGEMENT ISSUES TO BE ADDRESSED**

Vessels and vessel-related facilities, (e.g. including toilets, vessel launch ramps, moorings, marinas, and campgrounds), have the potential to affect the Tomales Bay ecosystem and impact water quality, habitat and public health and safety. When improperly managed or maintained, vessels and the facilities that support boating threaten the valuable resources of Tomales Bay through:

- A. Pathogen and nutrient impairment of beneficial uses, including mariculture;
- B. Discharges of fuel, oil, and toxic materials from vessel operation and boating facilities or derelict vessels;
- C. Ecological effects of invasive species released by vessels;
- D. Disturbance of wildlife by vessel operation;
- E. Habitat damage and threats to navigation from anchoring, mooring or deserted vessels that come aground; and
- F. Public safety threats from improperly moored, grounded, or deserted vessels.

### **A. Pathogen and Nutrient Impairment**

Monitoring results reported in the Tomales Bay TMDL for pathogens for Tomales Bay and main tributaries (Lagunitas, Walker, and Olema Creeks) indicate that these waters exceed bacteria water quality objectives for shellfish harvesting and recreational waters and therefore have been determined to be impaired by pathogens (see Appendix # 2). The presence of pathogens is inferred from high fecal coliform bacteria concentrations, a commonly used indicator of human pathogenic organisms (SF RWQCB, 2005).

Pathogens in human waste can adversely affect oyster harvesting, water contact sports, clamming, and the general aesthetics of the Bay. Sources of pathogens include runoff from confined animal facilities (dairies), grazing lands, equestrian facilities, wildlife, vessels, and faulty septic systems. While the non-vessel related sources can contribute to the pathogen loading in Tomales Bay, they are addressed through other means and are not considered in this *Plan*. This *Plan* addresses human wastes that can enter Tomales Bay through sewage discharge overboard from vessels as well as from inadequate or failing on-shore toilet facilities for boaters.

Studies demonstrate a correlation between boating activity and elevated levels of fecal coliform, especially in areas of poor flushing (NCDEM, 1990; Sawyer and Golding, 1990; Milliken and Lee, 1990; Gaines and Solow, 1990; Seabloom et al., 1989; Fisher et al., 1987). Fecal coliform levels in marinas and mooring fields become elevated near vessels during periods of high vessel occupancy and usage. NOAA identified boating activities (the presence of marinas, shipping lanes, or intracoastal waterways) as a contributing source in the closure to harvesting of millions of acres of shellfish-growing waters on the east coast of the United States (Leonard et al., 1989).

Fecal contamination of shellfish areas can cause severe human health problems such as gastroenteritis, hepatitis, or even death. Disease-causing organisms found in human waste can include noroviruses, hepatitis viruses, *E. coli* (a fecal coliform species) and other

enteric (intestinal origin) pathogens. Fecal coliform bacteria are the indicator species used to determine water quality in shellfish growing waters. Commercial shell-fishing operations in the Bay are closed an average of 70 days per year due to high bacteria counts (SF RWQCB, September 2005). The positive relationship between sewage-polluted shellfish and enteric disease is well documented (Berg, et al, 2000). Because shellfish pump and filter large quantities of water as part of their feeding process, rapid intake and concentrations of bacteria, viruses, marine toxins, and other poisonous and deleterious substances may occur. Therefore, shellfish may contain higher levels of chemical contaminants or pathogens than are found in the water in which they grow. Fecal coliform bacteria are the indicator species used to determine water quality in shellfish growing waters (National Shellfish Sanitation Program, 2005).

The most likely sources of human sewage contamination to shellfish growing areas are from a discharge of a land-based sewage disposal system, improper waste handling on shore, or from a vessel's overboard discharge. In May 1998, an illness outbreak occurred affecting at least 171 people. A similar outbreak of illness occurred in March 2005 affecting at least 14 people. Both of these illness incidents were associated with the consumption of raw oysters from Tomales Bay. The cause of both illness outbreaks was determined to be a Norwalk-like virus. The only source for this virus is human sewage. Vessel discharges and septic systems are the main sources of human sewage in Tomales Bay (CDPH).

Fecal contamination makes water unsightly and unsuitable for recreation. At various times, human health advisories have been posted to warn against swimming at a number of popular swimming beaches on Tomales Bay and along Lagunitas Creek. The County of Marin has implemented a water quality-monitoring program to evaluate conditions for recreational activities, and found that some of the most popular swimming spots were not meeting state standards. Chicken Ranch Beach, Inkwells, and spots along Lagunitas Creek in Samuel P. Taylor State Park and near the Green Bridge were frequently found to be in excess for total coliform, E.coli, and Enterococcus bacteria (Tomales Bay Watershed Council 2004).

Additional monitoring for pathogens has been conducted during a coastal volunteer monitoring event called "Snapshot Day," a one-day monitoring event where watershed groups partner with state and regional agencies and citizen volunteers to collect water quality data using standardized protocols. In May 2003, volunteers collected samples at more than 15 locations in the Tomales Bay watershed. The following creeks exceeded the established standard for E. coli, which is 235 MPN/100 ml., per EPA Ambient Water Quality Criteria: Haggerty Gulch (2,419.20 MPN/100 ml); Lagunitas Creek (261.30 MPN/100 ml); Olema Creek (387.30 MPN/100 ml); and Tomasini Creek (261.30 MPN/100 ml). Miller Park Pier exceeded the transparency (clarity) standard of not less than 25 cm (it was 12.10 cm) (Tomales Bay Watershed Council 2004). It should be noted that any May water quality results usually represent a "dry season" sampling event for the Tomales Bay watershed and may not represent adverse conditions for pathogens that could occur in the "wet season" (CDPH, personal communication).

Sewage discharge from vessels also introduces additional demand for oxygen that can impair the health of the aquatic environment. Sewage discharge stimulates algae blooms that reduce available oxygen needed by fish and other organisms. Human waste also contains nutrients that can pose a threat to aquatic ecosystem beneficial uses. Tomales Bay, Walker Creek, and Lagunitas Creek are listed as impaired by excess nutrients. Human waste may also contain other harmful constituents such as steroids and pharmaceuticals.

The untreated discharge from one weekend boater puts the same amount of bacterial pollution into the water as does the treated sewage of 10,000 people (SF RWQCB, San Francisco Estuary Project). Coast Guard regulations set water quality specifications for wastes discharged from boaters' Marine Sanitation Devices (MSDs). For example, a maximum fecal coliform count of 1,000 per 100 ml is allowed for wastes discharged from Type I MSDs; fewer for Type II MSDs. Type III MSDs should only be emptied at an onshore pumpout station, with a portable pumpout unit or by a commercial service unless you are operating outside the three-mile limit in the open ocean.

Some studies have found a significant increase in gastrointestinal illness for swimmers over nonswimmers at 1,000 fecal coliform per 100 ml - the amount allowed with a Type I MSD. A fecal coliform count of 14 per 100 ml closes commercial shellfish beds and is cause for alarm. Since the last 30 samples are used to classify the shellfish growing area based on its geometric mean and 90<sup>th</sup> percentile (CDPH, personal communication). The shellfish growing area water quality data is evaluated annually. A count of 200 fecal coliform bacteria per 100 ml of water will close public beaches to swimming.

Eliminating discharges of human waste into the Bay will protect pathogen-impaired beneficial uses such as shellfish harvesting, water contact recreation, and non-contact water recreation. Eliminating discharges of human waste into the Bay will also protect aquatic ecosystem beneficial uses such as marine habitat, estuarine habitat, cold and warm freshwater habitat, and wildlife habitat from other harmful constituents found in human waste.

## **B. Discharge of Fuel, Oil, and Toxic Vessel Maintenance Products**

The use of motor-driven vessels has the potential to increase petroleum hydrocarbons in the Bay. Vessels can contribute fuel and other hydrocarbon-based pollutants to the water through emissions of marine engines, discharges of fuel and oil from engines and bilges, spills associated with fueling, spills occurring during oil changes and used oil transfer, and spills caused by deserted and sunken vessels.

Research conducted in 1998 by the CCC's *Boating Clean and Green Campaign* revealed that 76% of boaters whose vessels have a marine engine change the oil on their vessels themselves (Public Research Institute, 1998). Changing oil on a vessel can cause spills that release oil to the bilge and/or nearby waterways. Fuel evaporates in the air, can be broken down by sediment microorganisms, and can accumulate in sediments, marine plants and animals, particularly in estuaries and intertidal areas. The accidental or purposeful discharge of oil, contaminated bilge water, or other toxic materials generated

by boating activities can have serious effects on marine organisms. Even at low concentrations, some components are toxic to marine plants and animals, can cause cancer, mutations and/or birth defects, and behavioral changes in shellfish and fish.

Boating facilities, such as marinas, vessel repair facilities, and fueling stations, can contribute to the degradation of the Bay ecosystem. Pier construction and/or maintenance for boating may change circulation patterns in the Bay and piles can release toxic substances. Discharges of toxic vessel cleaning and maintenance products, such as copper-laden bottom paints, solvents, and soaps, are common from vessel maintenance facilities in California. Spills and drips from fueling facilities can also contribute to water quality degradation.

### **C. Introduction of invasive species**

The invasion of non-native species in Tomales Bay can cause the loss of native species and alter habitats. These losses can change food webs and thereby degrade the biological diversity of the Bay. Invasive species can compete with important species such as Herring, Steelhead and Coho Salmon that rely on the existing biological community structure of Tomales Bay. Invasive species can also impact the surrounding landscape and effect shorelines and navigation.

Non-native invasive species are introduced into Tomales Bay in several ways. Historically, the main sources were ballast water and mariculture activities. Near-shore currents that carry larvae and plants north from the San Francisco Bay, the most highly invaded estuary in the United States, have caused more recent introductions.

Human activity is primarily responsible for the introduction of non-native species in a marine ecosystem. The release of ballast water from ships or in the bilges and holding tanks of vessels introduces invasive species into a water body. Fisherman may unintentionally introduce non-native species when emptying bait buckets into a local waterway. People can also introduce invasive species when they dump the contents of pet aquariums into a stream or bay. The release of non-native pet species into the local area can also introduce a non-native animal species. Ornamental plants used in landscaping and home aquaria can release seeds that interfere with the local flora.

When a non-native species is introduced into an ecosystem, it can sometimes out-compete native species because it may have no natural predators in the area into which it was introduced. Invasive species can impact an ecosystem not only by disrupting the predator-prey relationships, but also by transporting parasites or pathogens. Some plant invasive species, such as Smooth Cord Grass (*Spartina Alterniflora*) grow in dense clusters that alter water flow and can gradually change mudflats into meadows. These changes reduce habitat for migratory and nesting birds, spawning fish, and many species of invertebrates.

Introduction of invasive plants and animals has been well-documented on vessels in San Francisco Bay but not in Tomales Bay. The primary source of invasive aquatic species in Tomales Bay has been through mariculture (Carelton 1992). The National Park Service,

through Pacific Coast Science and Learning Center, has conducted inventories of all species in Tomales Bay since the late 1990s, including introduced species. Several species of invasive plants and animals were identified, some of which may have been introduced by vessels by “hitch-hiking” on vessel bottoms or from bilge water discharge.

In Tomales Bay, the introduction and spread of the European Green Crab (*Carcinus maenas*) caused major declines in several invertebrate species on which they feed (Grosholtz and Ruiz 1995). This species was most likely transported by nearshore currents to Tomales Bay from San Francisco Bay. The shorebirds that feed on these invertebrate species may be impacted. Non-native perennial grasses have already taken over coastal terraces on Tom’s Point, adjacent to the Bay. Smooth Cord Grass has been detected several times in Tomales Bay, and if established, this plant would convert tidal flats to meadows and significantly change inshore and nearshore habitats. On-going monitoring of these and other potential invasions is taking place.

Species that threaten to invade Tomales Bay include:

- Asian Clam (*Potamocorbula amurensis*) eats zooplankton and can alter the available food sources and reproduction of a number of species.
- Chinese Mitten Crab (*Eriocheir sinensis*) can cause erosion along banks that damages fish spawning habitat.
- Berring Seastar reduces shellfish and oyster populations.
- Black Sea Jellyfish (*Maeotias inexpectata*) because it has few predators, populations can alter the Bay’s food web.
- Mediterranean Fan Worm (*Sabella spallanzanii*) disperses over large areas, preventing seagrass growth and thereby reducing native habitat.
- Parasites can weaken or kill native species and are introduced by traveling in the digestive tracts and tissues of larger organisms.
- Red Swamp Crayfish (*Procambarus clarkii*) burrowing behavior can cause erosion.
- Caulerpa Algae (*Caulerpa taxifolia*) is a common aquarium plant product that, if dumped into the Bay, would overtake native species and cause biological oxygen demand.
- Smooth Cord Grass (*Spartina alterniflora*) is a medium-large saltwater-loving grass that colonizes tidal marshes. It is considered a non-native invasive species in California. It has been found and removed several times in Tomales Bay.
- Winged oyster (*Pteria sterna*) has reached the Channel Islands due to the establishment from recent El Nino events and can transport diseases that degrade farmed and native oysters.

(Tomales Bay Biodiversity Partnership, and through personal communication with Jan Rolletto, Research Coordinator, GFNMS)

#### **D. Disturbance of Wildlife**

Many human activities can disturb wildlife and wildlife habitats. Vessels of all types can affect marine mammals and sea birds by disturbing their rest periods, nest sites, and haul-out areas. People coming ashore from vessels can disturb elk, deer, raccoons, seals and other wildlife that may be near the shore. Frequent watercraft landings in sensitive habitats and the destruction of seagrass beds by motors and fishnets can also have adverse effects.

Areas where species are particularly vulnerable to disturbance are Hog Island, Pelican Point and tidal sand bars north of Tom's Point. Motorboats regularly disturb birds at Pelican Point and Hog Island and those resting on the Bay. In the past five years, a colony of Double Crested Cormorants began nesting on Hog Island and has been disturbed on occasion by recreational visitors accessing the area by vessel.

Tomales Bay is one of several locations along the Point Reyes Peninsula where harbor seals (*Phoca vitulina richardii*) congregate onshore. The harbor seal colony in the Bay is part of the larger Point Reyes population, which represents about 20% of the estimated breeding population of California (Allen, 1992). Harbor seals come to Tomales Bay to breed and molt in the spring and summer and to feed on herring and other marine fish species. They haul out to give birth and rest on tidal sand bars, and sandy pocket beaches, especially on Hog Island and near Tom's Point. The seal haul-out areas near Tom's Point have been studied for a number of years. The studies have included observations of disturbance patterns. Seals in Tomales Bay exhibited the highest disturbance level of any haul out in Point Reyes. Seals were disturbed on 49% of the observation days, compared with 29% at Double Point in Point Reyes. Fifty one percent of the disturbances were caused by clambers and fisherman, boaters accounted for 30%, hikers 14% and dogs 5% (Allen and Huber, 1984).

In a separate study, from 1991 through 1994, seals were disturbed on 81% of the observation days—almost double the amount of disturbances noted in earlier studies (Allen and King, 1992). Overall, 1.2 disturbances associated with humans were recorded every hour in 1991, which was the highest rate of disturbance ever reported on the West Coast (Mortenson, et al., 1999). Allen and King (1992) also noted that Hog Island haul-out sites had been mostly deserted by the seals.

In 1998, this information prompted the PRNS, GFNMS, and the Farallones Marine Sanctuary Association to begin a disturbance study on Tomales Bay to determine the types and levels of disturbance in conjunction with a docent program to help reduce disturbances. Data collected over the next six years showed a shift from clam digging to boating, and the noise from vessels was the number one activity associated with flushing seals off their haul out sites around the Bay. Motorboats have impacts related to increased noise pollution, gas and oil discharge, and sewage discharge.

The effects of kayaks on wildlife are different than other types of vessels. Kayaks have the least impact on marine and estuarine ecosystems since there are no motors or discharges of pollutants from a kayak. However, resting seals and birds on tidal sandbars can be disturbed more often by kayaks than by motor vessels, because kayaks can

maneuver in shallow water where motor vessels cannot. Kayaks can get closer to wildlife than motor vessels. They often approach wildlife before the animals are aware of their approach, resulting in flushing. Several studies have documented human-caused disturbance of seals and birds by kayaks in Tomales Bay (Allen, 2006, personal communication).

### **E. Destruction of Seagrass Beds**

Boating activity can destroy seagrass beds and thereby impact wildlife. Examples of boating activities that destroy seagrass beds include: anchoring, mooring, discarding fishing net, constructing docks and piers, and disturbing habitat with wakes, prop scarring and turbidity caused by motorized vessels. Seagrass beds provide habitat for many bird and fish species in Tomales Bay. Disturbance of seagrass beds can result in reductions in populations of these species.

Habitat impact likely varies with the type of recreation. Motorboats that enter seagrass beds can cause habitat destruction by increasing turbidity and propellers destroying the bottom and cutting plants. Anchoring or mooring can shade the seabottom and cut off light sources to seagrass beds.

Anchoring can also damage seagrass beds by interfering with the reproductive system (the Rhizome system). As vessels swing on their anchors, drag them in strong winds, or pull up their anchors, they can plow up seagrass beds, dislodging their stems and killing the plants.

### **F. Habitat Destruction**

In addition to marine habitats, the Tomales Bay watershed also supports estuarine wetland habitat along its periphery. The marshes of Tomales Bay at the headwaters of the Bay were once more extensive than they are today but were converted to pasture land over the past 100 years. However, many marshes were created along the east shore of the Bay when the railroad tracks were put in and blocked the waters thereby allowing marsh plants to become established. Currently, Tomales Bay supports approximately 440 acres of marsh and 2,900 acres of mudflats (California Coastal Conservancy, 1984; Evens, 1993). The marshes of the Bay support a diversity of flora and fauna, as well as enhance the Bay's water quality by filtering water (Evens, 1993). Marshes serve many roles, for example, by being part of the migratory path of many species of shorebirds and waterfowl along the Pacific flyway and serving as important foraging and breeding areas for the many birds in Tomales Bay (Evens, 1998; Kelly and Tappen, 1998). The watershed's marshes also serve as valuable spawning and nursery areas for anadromous fish, such as Coho Salmon and Steelhead Trout.

### **G. Un-permitted Vessel Moorings**

Improper placement of moorings or improperly moored vessels can cause hazardous conditions for navigation. Furthermore, moorings placed in seagrass beds or shallow

waters can destroy habitat by propeller scarring of the seabed, tearing up seagrass, and shading areas thereby inhibiting seagrass growth (Walker et al, 1989; Kentworthy et al 2006). Surveys of moorings in Tomales Bay conducted between 2002 and 2006 showed that most of the 178 moorings in the Bay are constructed of found materials, such as cement blocks, old automobile engines, tires, cement mix, steel drums, wood posts, and other materials. Some of these materials are not considered appropriate for the construction of moorings.

Most moorings in Tomales Bay are illegal. In 1981, when the GFNMS was designated, the Sanctuary Program prohibited disturbance to the seabed, therefore, moorings can only be installed under a permit that requires approval from the GFNMS. Jurisdiction and ownership of the holdings within Tomales Bay are divided among NPS, PRNS, SLC and GFNMS. The jurisdiction to permit or deny a mooring in Tomales Bay exists within these agencies. Each has its own process for obtaining a permit

The GFNMS may permit moorings for research, education, or monitoring activities that are related to Sanctuary resources and qualities and increase the understanding of the Sanctuary and salvage and recovery operations that lead to greater protection of Sanctuary habitat and wildlife (15 CFR § 922.82). Moorings are prohibited under this regulation because they constitute structures and alter the seabed. Two exemptions specified in the regulations are moorings for navigational aids and mariculture operations (5 CFR § 922.82(a)(3)(iii)). Moorings that were installed or placed after GFNMS designation in 1981 that are not for navigation or mariculture operations, or are not established as part of a research, education or salvage permit are prohibited.

Proposed changes to the GFNMS regulations would provide one additional exception to the mooring prohibition by giving the Superintendent of the Sanctuary discretion to permit mooring if it would “assist in managing the Sanctuary,” provided that the permitted activity does not result in greater than negligible short-term adverse effects on Sanctuary resources and qualities [71 Fed. Reg. 194 (October 6, 2006)]. If this regulatory change is approved, the GFNMS Superintendent will have the authority to designate mooring locations as reasonable and necessary to fulfill management responsibilities consistent with the purposes of the National Marine Sanctuaries Act and GFNMS regulations. Proposed regulatory changes for the GFNMS are drafted in the JMPR document (<http://sanctuaries.nos.noaa.gov/jointplan/archive/pdf/farallonesSOS.pdf>).

Moorings in PRNS require a permit pursuant to 36 CFR 1.5(a)1 that allows the PRNS Superintendent to close all or part of a park to any activity or to require a permit for such an activity. The PRNS has the authority to institute a permit system for vessel use within the Park and prohibit some activities (36 CFR Part 3 Boating and Water Use Activities, Title 36, Parks, Forests, and Public Property). The PRNS Superintendent is also allowed to close the park to moorings, or allow them under permit, control overnight stays, and prohibits residing on federal lands or waters, except under permit. PRNS requires permits for any moorings within the geographic boundaries of its jurisdiction but to date no permits have been issued for moorings.

The CDFG authorizes moorings for vessels used in mariculture operations. These moorings are located within each mariculture operation's lease area. These moorings are not exempt from the GFNMS seabed disturbance regulations in Tomales Bay and are permitted in the state of California.

#### **H. Unregistered and Derelict Vessels**

Derelict or deserted vessels can be hazardous to navigation by entering into or obstructing navigation channels, damaging vessels, damaging habitat, and threatening human health and safety. When derelict vessels sink, they have the potential to release pollutants that damage the environment or threaten wildlife or human health. Derelict or deserted vessels may also drift into other vessels, marina docks or other structures causing damage to both public and private property and potentially causing other vessels to sink (Port of Oakland, April 2001).

Vessels that come aground may themselves damage sensitive ecological resources. Grounded and deserted vessels are a problem in many coastal areas, and they are recognized as a significant threat for seagrass habitats (Kentworthy, W.J. 2006). In addition to the physical crushing and smothering of habitats, grounded vessels pose a significant danger of oil spills and release of other pollutants. They may impede navigation, block public and private uses of intertidal and subtidal habitats such as mariculture, become sites for illegal dumping of waste oils and hazardous materials, become visual eyesores, entrap wildlife, and create public health hazards (Michel et al., 2002).

## **VII. VESSEL MANAGEMENT RECOMMENDATIONS FOR TOMALES BAY**

The agencies that have participated in the development of this document identified areas in Tomales Bay that have a high potential for negative impact to water quality, habitat, wildlife, or public safety and recreational use from vessels. This section proposes specific actions, both short and long-term, to accomplish the goals and objectives set forth in this document. The primary goals and objectives of this document can be found in Section II. This document recommends actions to reduce the effects on water quality, natural resources, and public health, safety, and recreation from:

- Derelict and abandoned vessels
- Illegal moorings
- Destruction of seagrass beds
- Introduction of invasive species
- Vessel related sewage discharges
- Discharges of oil, fuel, and toxic vessel maintenance products from vessels

### **A. Current Agency Actions**

These actions are currently being implemented or planned for implementation by the participating agencies to accomplish goals and objectives identified for vessel management.

#### **(1) Removal of abandoned and derelict vessels**

Leaving vessels abandoned increases the likelihood of a calamitous event, the risk of sinking, and the likelihood of toxic product, oil, or fuel discharges. To address these concerns, NOAA is proposing regulations to minimize this threat (15 CFR Part 122, Federal Register/ Vo. 71, No. 194). The proposed regulation would prohibit the following: *Deserting a vessel aground, at anchor, or adrift in the Sanctuary*. In conjunction with this proposed prohibition, a new definition of “deserting” would be added to the regulations to clarify the specific applicability of this prohibition.

Once a vessel is grounded there is a high risk of discharge of harmful matter in the marine environment. Currently, removal of harmful substances (e.g., motor oil) is not specifically required unless a discharge has occurred. Therefore, NOAA is proposing an additional regulation that would establish the following prohibition: *Leaving harmful matter aboard either a grounded or deserted vessel in the Sanctuary*.

Tomales Bay is believed to have had 30 derelict or deserted vessels during surveys conducted by GFNMS, NPS, and the Marin County Sheriff’s Department in the last 10 years. With the assistance of grant funding from DBW, the Marin County Sheriff’s Department is in the process of removing abandoned and derelict vessels. The Department is authorized to take such action pursuant to the California Harbors and Navigation Code, section 526. The Department has also been tagging vessels that are

undocumented or unregistered to notify owners that action will be taken to remove unidentified vessels that will be presumed to be abandoned. As a result of the tagging and removal operations, the Sheriff's Department believes there are currently 2 or 3 remaining derelict vessels in Tomales Bay.

## **(2) Removal of illegal moorings**

Based in Sanctuary regulations that prohibit altering the seabed, and also proposed new GFNMS regulations that would strengthen this prohibition, NOAA has begun removal of illegal moorings (i.e. any mooring placed in Tomales Bay after 1981). The current authority for this action is found at 15CFR922.82(ii).

## **(3) Creation of seagrass protection zones and prohibition on anchoring in these zones**

NOAA proposes to add a provision to GFNMS regulations to prohibit vessels from anchoring in designated seagrass protection zones in Tomales Bay, except as necessary for mariculture operations conducted pursuant to a valid lease, permit, or license (15 CFR 122, Federal Register/ Vol. 71, No. 194). There are seven proposed protection zones that would protect known seagrass beds from anchoring. These seven zones would encompass approximately 22% of the surface area of the Bay and a map can be found in Chapter two of the Draft Environmental Impact Statement at:

<http://sanctuaries.noaa.gov/jointplan/drafts/eis.html>. This action would provide direct and indirect protection to biological resources and habitats and the ecological services they provide. The final vessel management plan should include a long-term enforcement strategy for implementing this prohibition if it is adopted.

## **(4) Preventing the introduction of non-native species into Tomales Bay**

A proposed rule for the GFNMS would prevent the introduction of non-native species into Tomales Bay, with exceptions for striped bass released during catch and release activities and species cultivated pursuant to existing mariculture leases. The rule is proposed in Federal Register Vol. 71, No. 194, on October 6, 2006.

The latter three of these actions (removal of illegal moorings, creation of seagrass protection zones, and preventing the introduction of non-native species into Tomales Bay) are all part of the Joint Management Plan of the GFNMS, the Cordell Bank National Marine Sanctuary, and the Monterey Bay National Marine Sanctuary that was released in October 2006. These are proposed regulations that have been through extensive public review. Sanctuary staff held public scoping meetings in communities adjacent to the sanctuaries in late 2001 and early 2002. The Sanctuaries issued action plans, draft management plans, proposed rules, and draft Environmental Impact Statements that contain these action items. The sanctuaries took written comments and hosted a series of public hearings on the draft plans. The public comment period is closed and NOAA is reviewing comments and making necessary changes before issuing final management plans.

A complete analysis of these proposed regulations can be found and downloaded in the Draft Environmental Impact Statement at:

<http://sanctuaries.noaa.gov/jointplan/drafts/eis.html>. The Final GFNMS Joint Management Plan is scheduled to be released in early 2008.

## **B. Potential Future Agency Vessel Management Options**

### **(1) Sewage Waste Management Options**

One significant concern in Tomales Bay is that water-related recreational and commercial uses may contribute to contamination of the Bay by fecal coliform bacteria and cause pathogen contamination. In particular, overboard human sewage discharges to the Bay may cause potential impacts to the commercial oyster industry in Tomales Bay and associated public health effects to water contact recreational uses and shellfish sport harvesting. Recent studies by the California Water Board and the County of Marin have documented the number and type of vessels and the number and types of vessel-related facilities. Their studies have made the following assessment regarding the adequacy of sewage disposal facilities in the Bay in relation to the number of vessels:

- There are an adequate number of public restroom facilities at the public access sites (including day- and overnight-shoreline recreational uses). The only complaint noted was that some of the facilities were of the temporary portable-john or construction site style. These temporary facilities lacked the cleanliness, low odor, and nicer aesthetics associated with a permanent type installation. This conclusion was confirmed in both the California Water Board and County reports.
- There are currently no pumpout or dump stations in Tomales Bay There is currently no standard for the number of pumpout or dump- stations that should be available to service vessels in a particular locale. Although there are no set guidelines for determining whether a vessel is likely to have an installed Marine Sanitation Device (MSD) or other portable device onboard, as a general rule it is the size of the vessel that determines what type of MSD equipment may be found onboard. Typically, vessels 16 – 26 feet in length may have a porta-potty type device onboard, but would probably not have a permanently installed marine head plumbed to a holding tank, which would require a pumpout station to service it. Vessels 26 feet and greater in length typically are of the size range that may have a permanently installed marine head with a holding tank onboard and therefore would require the use of a pumpout station. These general rules vary slightly and the current trend is seeing permanent heads available on new vessels as small as 23 feet. Although Federal and DBW guidelines recognize vessels as small as 16 feet for dump station requirements, the Tomales Bay field survey revealed that many of the vessels in the 16 – 20 feet range were small sailboats or fishing

vessels that did not have any installed head with an MSD onboard. Therefore, for the purposes of this report, only those vessels 21 – 25 feet in length will be counted towards any dump station recommendations. Vessels 26 feet and greater in length will be counted towards any pumpout station recommendations. Using the restrictions noted above, DBW's aerial count resulted in the following estimated vessel breakdown:

- i. Vessels requiring a dump station (power / sailboats 21-25 feet) = 87
- ii. Vessels requiring a pumpout station (power/sailboats 26 ft and greater) = 71

The California Water Board study recommended that, at a minimum, one pumpout station and one dump station are needed in Tomales Bay to provide adequate sewage waste facilities (Waterboard, 2004).

- **Interim Vessel Sewage Management Options**

Without a single dump station or pumpout in Tomales Bay, there are insufficient facilities in place to provide adequate disposal of sewage waste from existing vessels. Given the known water quality impairment due to pathogens in Tomales Bay and the potential risks associated with sewage discharge, the cooperating agencies recommend that the following actions be implemented in the short-term to minimize potential risk associated with sewage discharge:

- Agencies will coordinate with existing public and private boating facility operators to encourage development of adequate sewage pumpout and dump stations. Agency coordination will include streamlining of necessary permits and public funding sources to support construction of sewage waste facilities;
- All new marina or vessel repair facilities or proposed expansion of existing facilities will be required by permitting agencies to provide sewage waste management facilities appropriate to number and size of vessels and number of visitors;
- Occupied vessels must demonstrate sufficient capacity and technological capability to manage sewage waste on-board without overboard discharge;
- Agencies will seek federal (U.S. Environmental Protection Agency) designation of Tomales Bay as a No Discharge Zone, thus prohibiting discharges of any human waste, treated or untreated, into the Bay;
- Agencies will implement an education and outreach program for all vessel users (overnight and day users) on proper management of sewage waste; and
- The Vessel Mooring Committee will urge the SF RWQCB to continue the process of developing regional standards and requiring installation of appropriate sewage disposal facilities at marinas in Tomales Bay (pursuant to Harbors and Navigation Code Chapter 6, Division 3, sections 776 and 778 and the California Code of Regulations Title 23, Chapter 20 and 20.1).

- **Longer-Term Considerations for Vessel Waste Management Facilities**

Any vessel waste management facility plan must support the identified or anticipated number of vessels. The cooperating agencies recommend that the final vessel management plan include a thorough evaluation and recommendation of the following issues:

- The expected number, type, and location of vessels in the next few decades. Such information would be used to determine the appropriate number, type and location of vessel waste management facilities.;
- Types of sewage disposal methods may include a honey barge, use of on-board MSDs, porta-potties, dump stations, and pumpout facilities, etc.;
- Location of disposal facilities should consider ease of access, public vs. private access, depth of draft, and safety issues associated with accidental spills;
- No new facilities or expansion of existing facilities should be permitted without documentation of adequate sewage waste management facilities appropriate to size of vessel or number of visitors;
- All public lands (including federal, state and local parks) should consider opportunities for development of sewage waste management facilities in the future; specific opportunities to be evaluated are: 1) National Park Service's enhancement of public pumpout station at Sacramento Landing; 2) CSP to include restroom/dump station at day-use area in Marconi Cove; and
- If moorings are permitted in future, include designated approach to managing sewage waste including an evaluation of the following: requirement to contract with regular sewage service contractor (e.g. honey barge) or permanent hook-up to land-based sewage disposal field, and/or enforcement personnel to ensure proper disposal of boating waste.

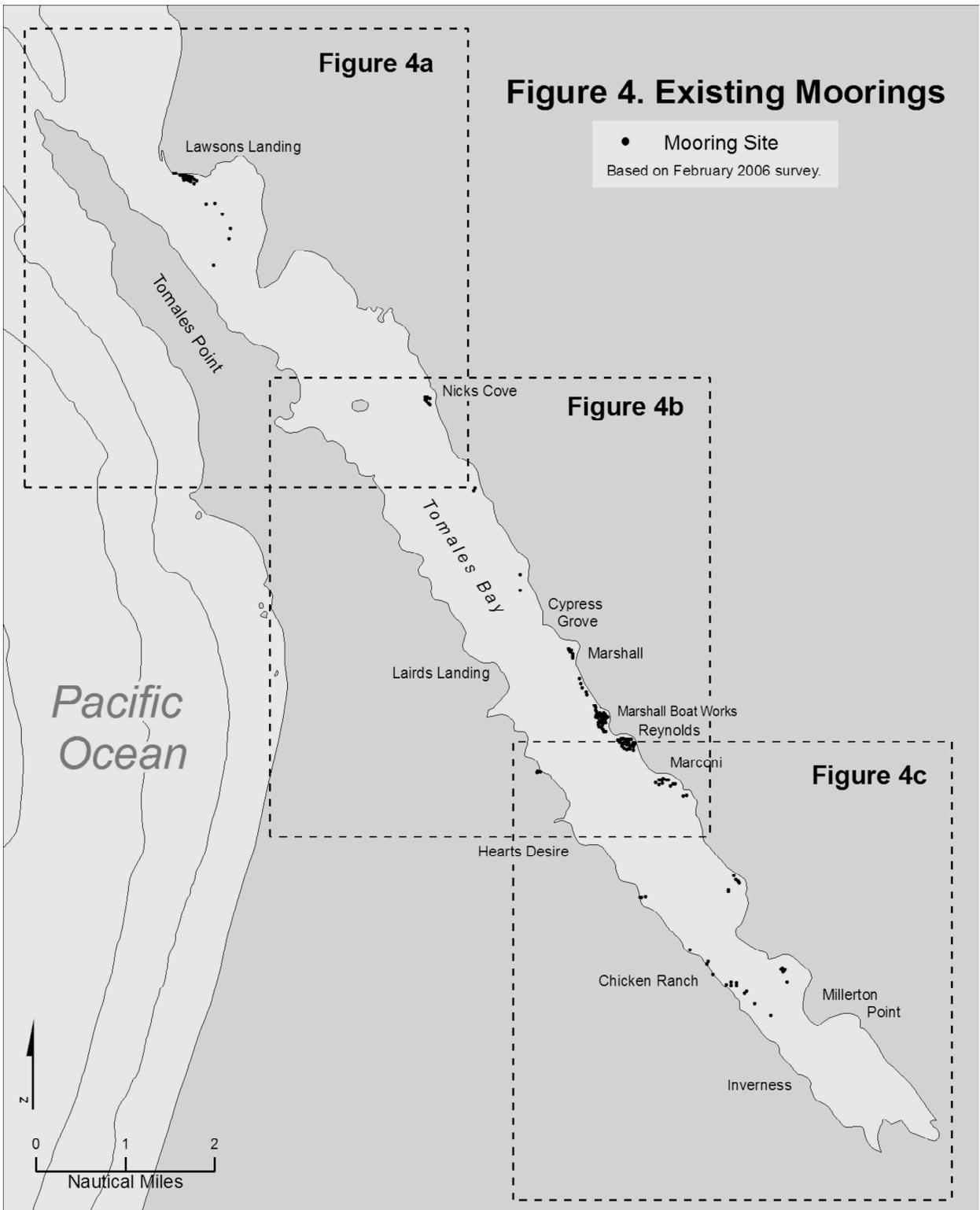
## **(2) Mooring Criteria and Options**

One vessel management issue identified as an immediate concern is the location of existing moorings in Tomales Bay. Moorings can damage the sensitive ecological resources and present a public health and safety threat when placed in navigation channels (Walker et al, 1989; Kentworthy et al, 2006) .

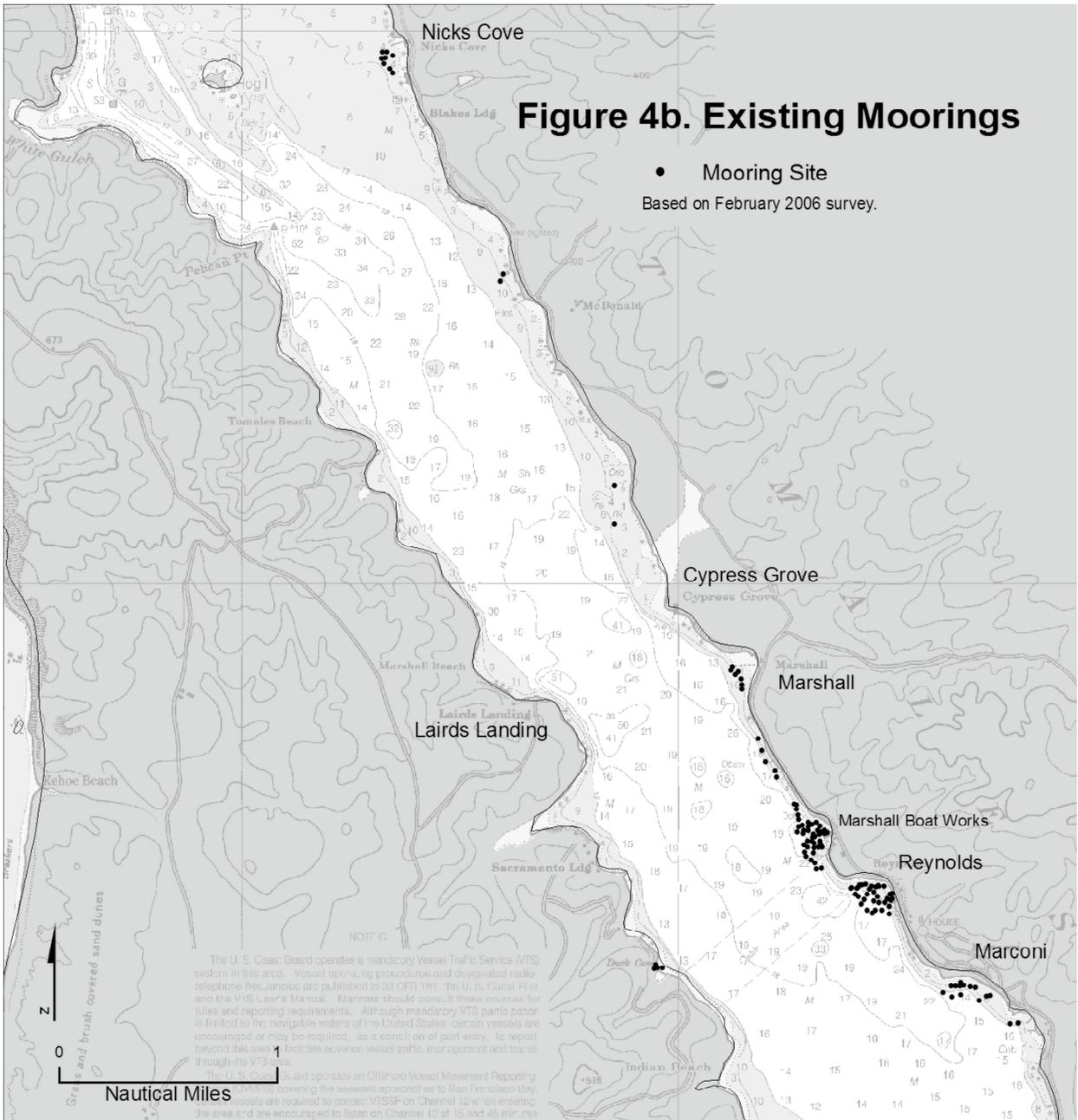
In order to protect water quality, natural resources, and public health in Tomales Bay, the cooperating agencies recommend that the following actions be implemented in the short-term to minimize potential impacts:

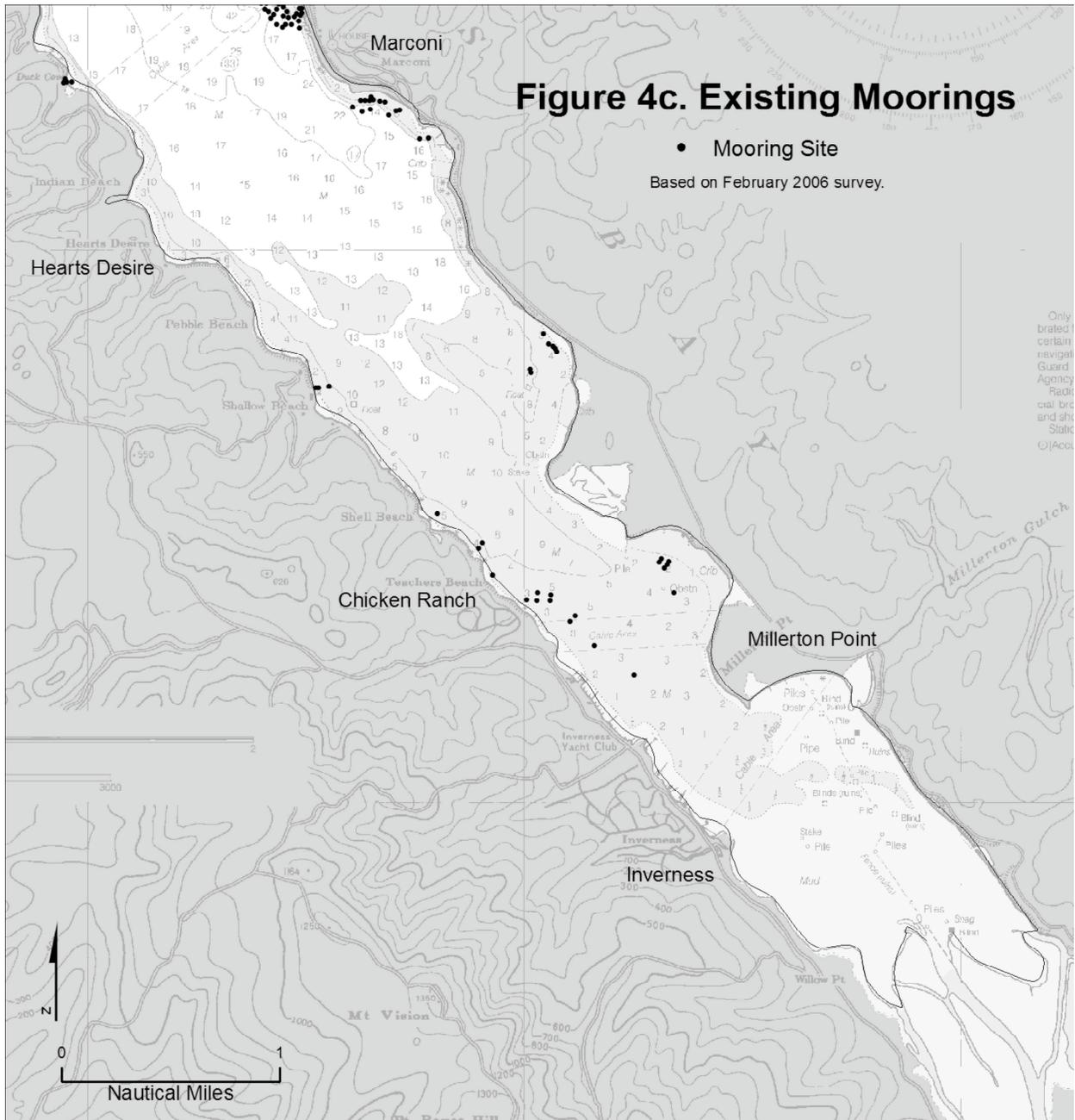
- Moorings installed after GFNMS designation in 1981 will be removed.
- All sensitive areas will be identified.
- Seagrass protection zones will be established.
- An education and outreach program about vessel registration, moorings and vessel activities in Tomales Bay will be initiated.

Maps showing the location of existing moorings in Tomales Bay, based on the 2002, 2004, 2006 surveys are provided in Figures 4, 4a, 4b, and 4c.









The participating agencies suggest adopting a new strategy to permit well-constructed moorings in areas outside of the protected areas and to evaluate vessel storage needs of Tomales Bay vessel operators. Three alternatives to accommodate mooring and vessel storage needs in Tomales Bay are presented in this Plan. These include:

- Alternative 1: creating mooring fields in areas outside of the protection zones described below;

- Alternative 2: creating a process for an individual to apply for a mooring permit through a single- or joint-agency permitting procedure.
- Alternative 3: evaluating the availability of vessel storage near common points of access to the water.

Mooring siting criteria are proposed (below) by the participating agencies to protect water quality, natural resources and public health and safety. These criteria should be applied to either mooring option.

### **a) Mooring Siting Criteria – Protecting Water Quality, Natural Resources, and Public Health and Safety**

In identifying the potential risks to water quality, habitats, and public health, safety, and recreation, the cooperating agencies identified a list of sensitive areas in Tomales Bay that are likely to be harmed by vessel operation. The existing practice of mooring vessels in these areas has a high potential to degrade either water quality or sensitive habitat, impact wildlife, or threaten public safety. The cooperating agencies propose strengthening the protection of these sensitive areas by removing all legal and illegal moorings in these areas and within buffer zones around these areas. Each of these sensitive areas is identified and discussed below.

#### **(i) Water Quality Protection**

- *Mariculture Lease Areas* (active only): There are currently seven certified active commercial shellfish harvesters in Tomales Bay with a combined mariculture lease area of 483 acres<sup>3</sup>. All the active commercial growers in Tomales Bay operate on the eastern shoreline on leases granted by DFG. These lease areas support commercial oyster operations. Oysters are filter feeders and tend to concentrate potential pathogens in their tissues. It is recommended that moored vessels be restricted from using these areas to eliminate the potential for sewage discharge onto the oyster beds.

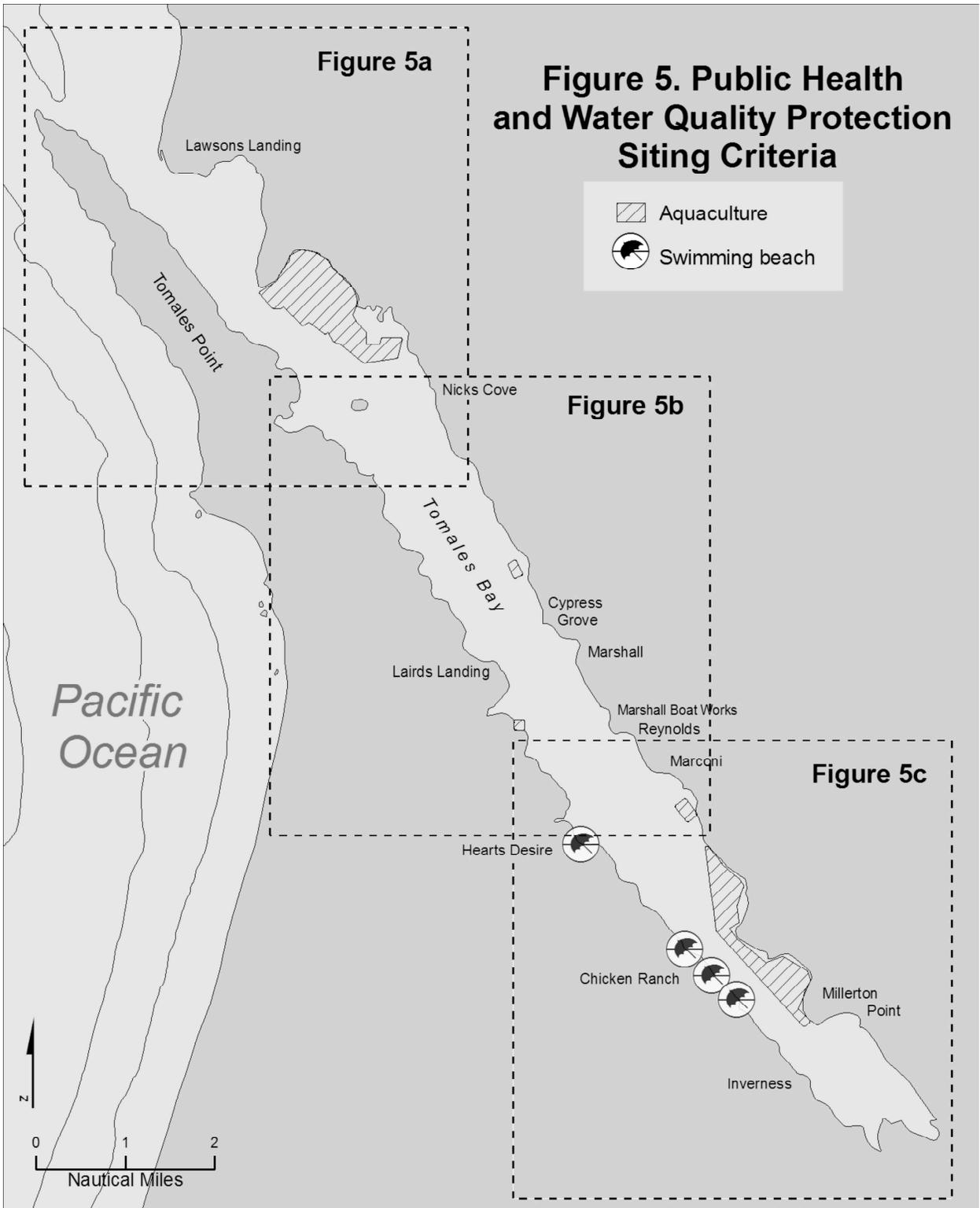
The safe distances are based on the number of vessels and volume of water surrounding each vessel relative to fecal coliform dilution to safe levels (below 14 Most Probable Number) and does not factor in viruses and other pathogens. The unacceptable proximity of any vessel with the potential for sewage discharge will result in immediate closure of the growing area(s). Buffer zones based on virus concentrations would be significantly larger due to their lower infectious dose and potentially longer survival. In cases of an overboard discharge or a vessel owner that fails to comply with law enforcement demands, CDPH may deem the situation unmanageable and

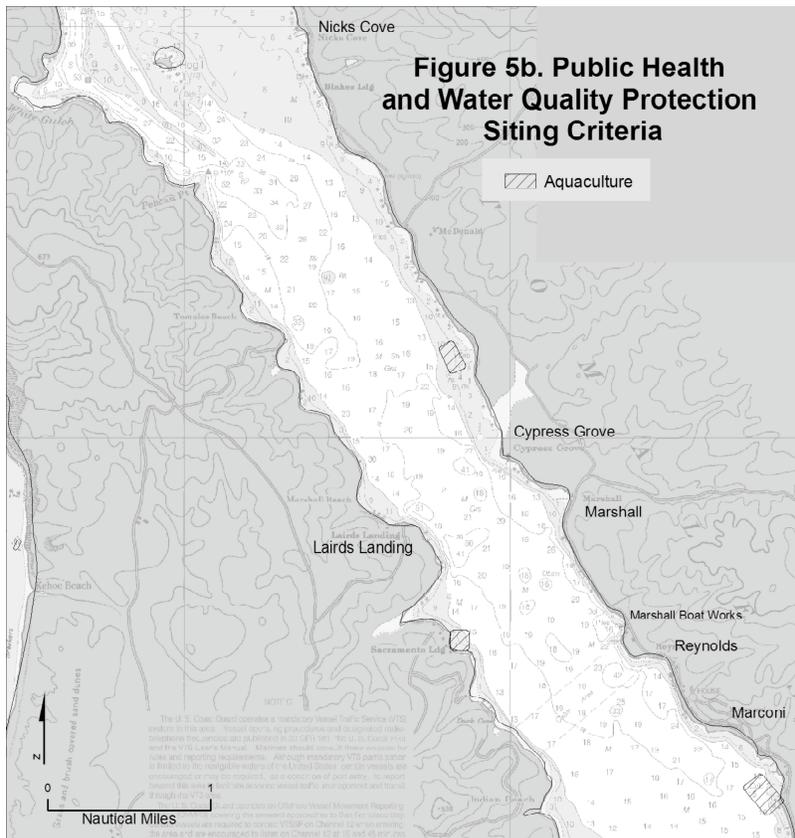
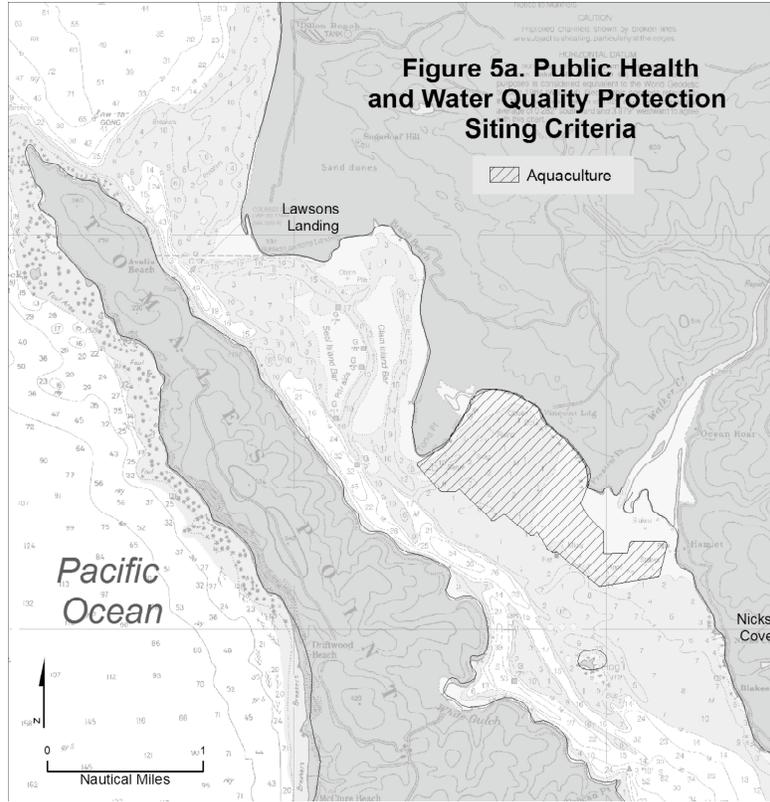
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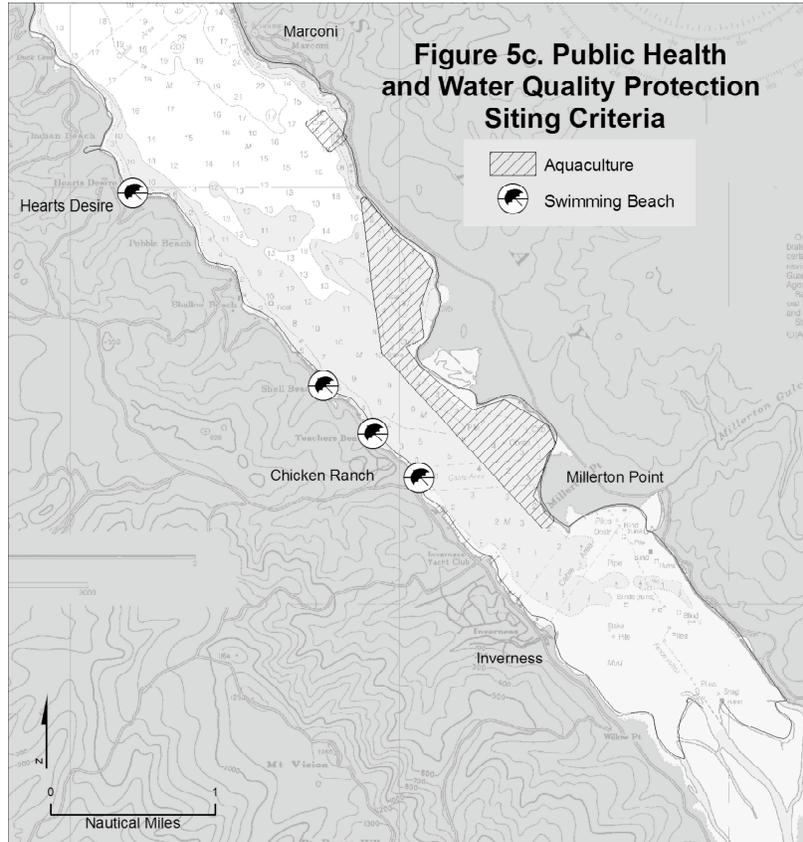
<sup>3</sup> The following mariculture leases are listed in the TMDL for Tomales Bay: Marin Oyster Company, Bernal Brothers Oyster Company, Cove Mussel Company, Hog Island Oyster Company, Pt. Reyes Oyster Company, and Tomales Bay Shellfish Farms.

reclassify the shellfish growing areas based on the ongoing threat from the vessel.

- *Swimming Beaches:* There are three designated swimming areas in Tomales Bay: Shell Beach, Hearts Desire Beach and Chicken Ranch Beach. It is recommended that moored vessels be restricted from using these areas to eliminate the potential for sewage contamination of public swimming areas. A buffer zone of 100 feet around each swimming area has also been recommended.





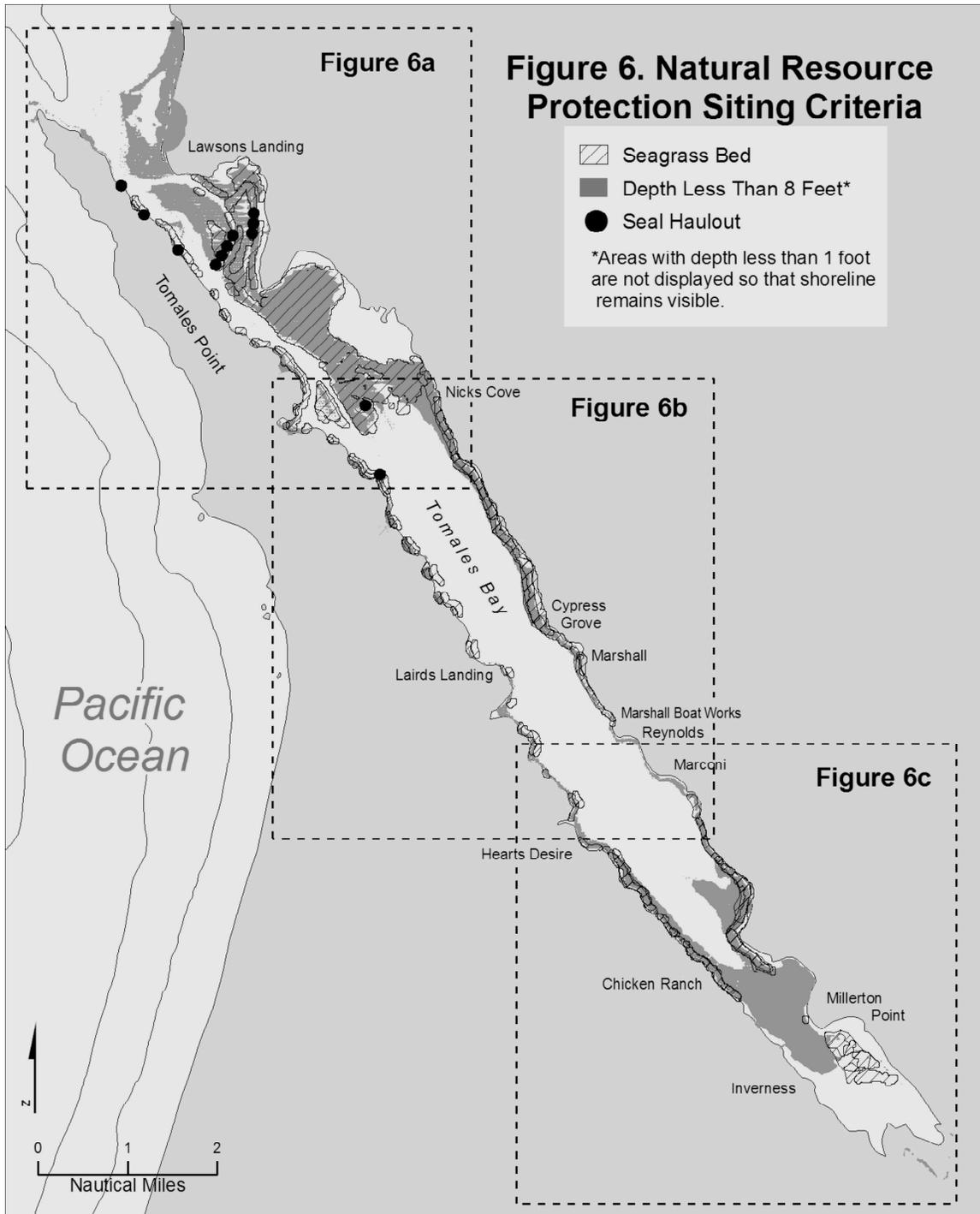


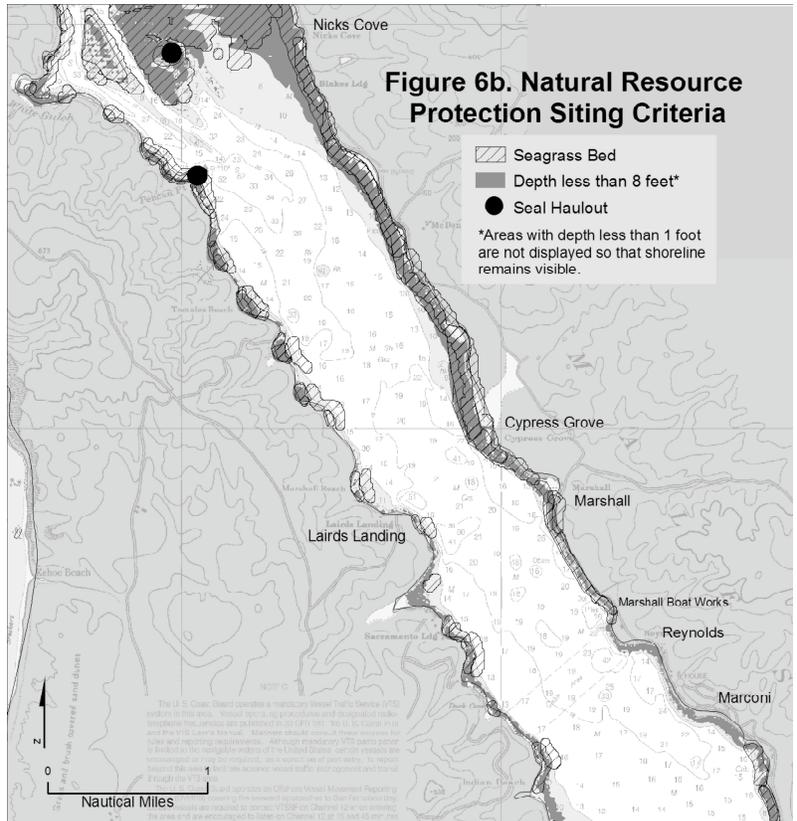
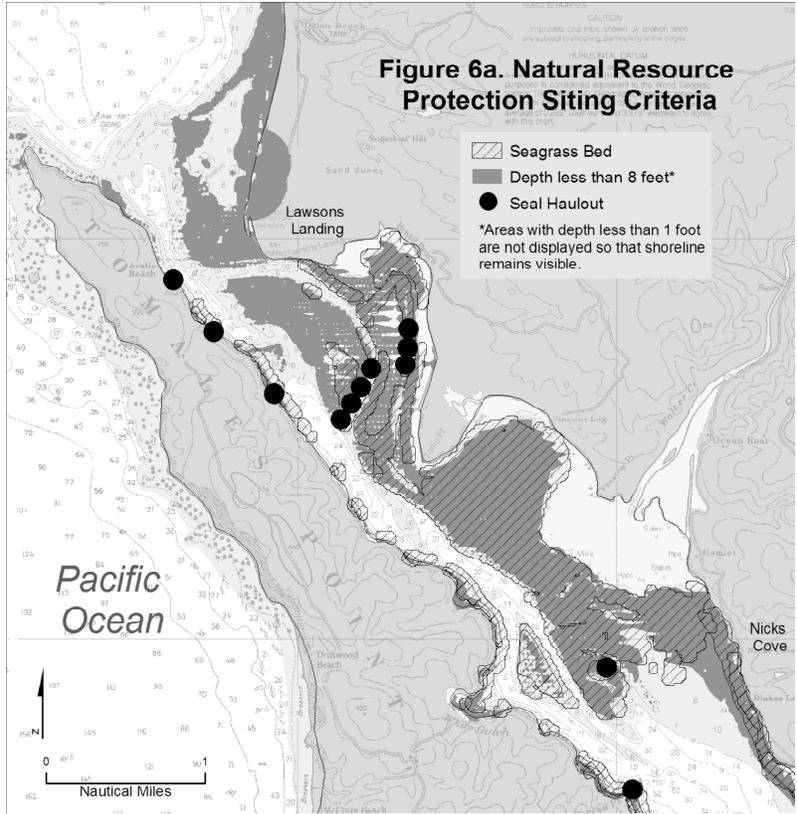
(ii) Natural Resource Protection

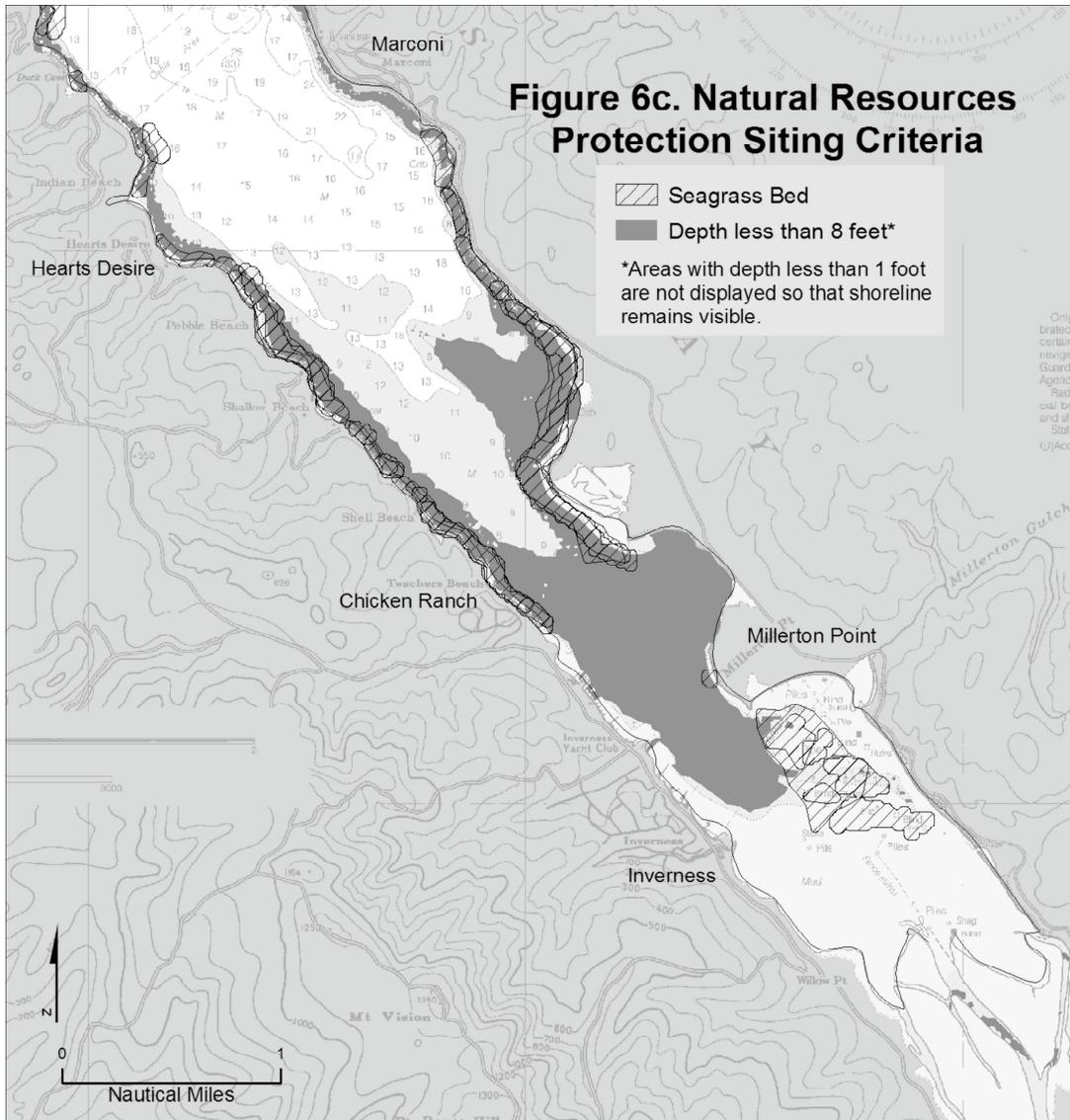
- *Harbor Seal Haul Out Areas:* Using information from the NPS's database, 7 haul-out areas have been identified. Since vessels are known to cause disturbance to marine mammals and can negatively affect their resting, breeding and feeding habitats, it is recommended that vessels be prohibited from mooring in these haul-out areas. In addition, a 300-foot buffer zone around these areas has been designated. This buffer zone is based on the recommended guidelines of the National Marine Fisheries Service.
- *Seagrass Beds:* The eelgrass beds in Tomales Bay have been mapped based on the CDFG aerial survey data from 1999, 2000, 2001 and 2002. Because moored vessels can cause damage to the eelgrass beds, moored vessels should be excluded from these areas. Since eelgrass beds do migrate, a safety margin around each mapped area of 100 feet has been added as a buffer zone to further protect the areas. In addition, a depth restriction of eight feet is recommended to prevent mooring in areas that can be viable seagrass habitat and/or can include historic eelgrass beds where seagrass may re-establish. A

similar depth restriction has been used to establish no motor zones in seagrass beds in the Florida Keyes National Marine Sanctuary.

- *Marshes, Mudflats:* The eight-foot depth restriction on mooring is also recommended as a means of protecting marshes and mudflats. Draft of vessels at low-low tide can scrape, scar, alter the composition and damage sensitive species in mudflats and marshes thereby reducing habitat and impacting sensitive species.

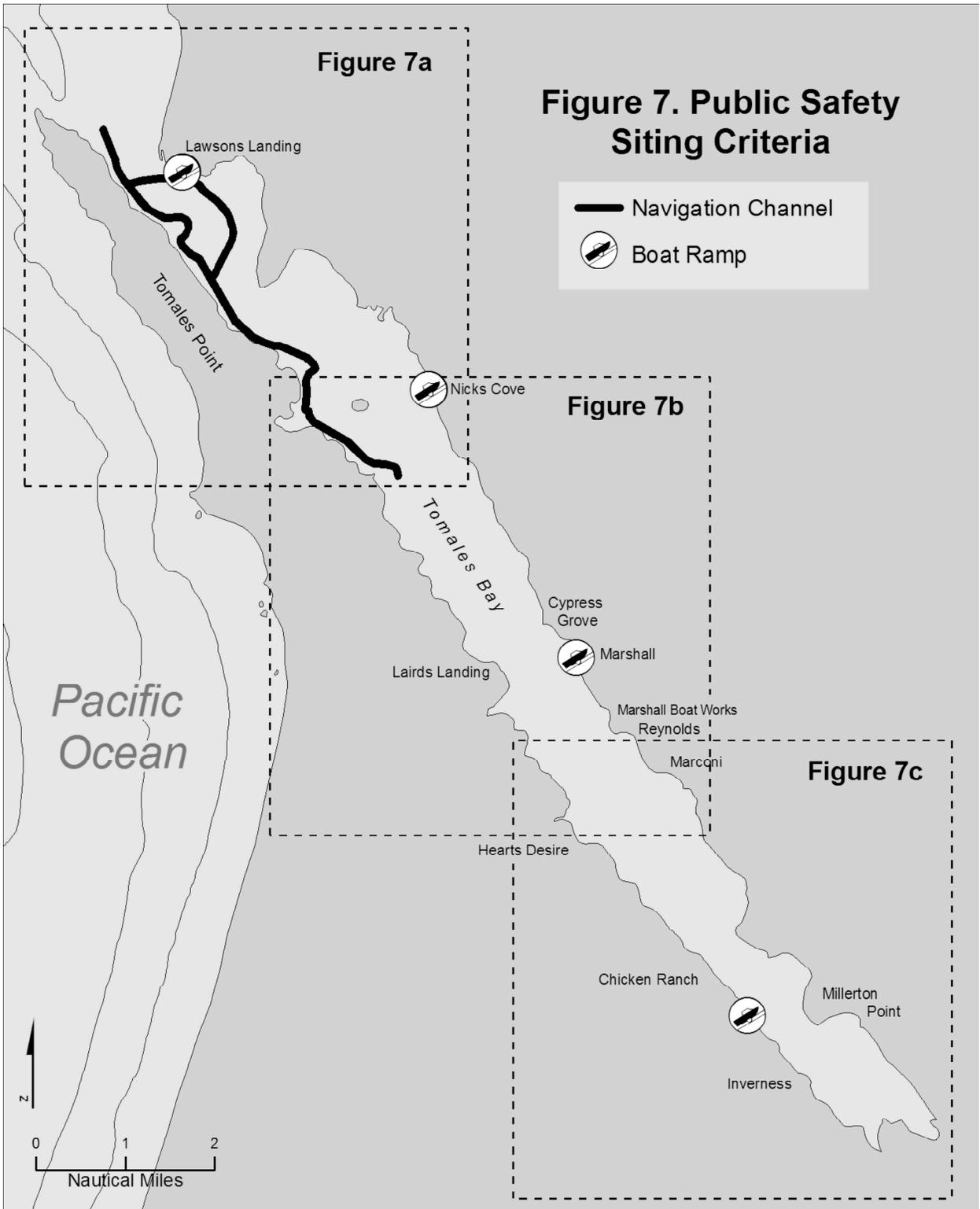


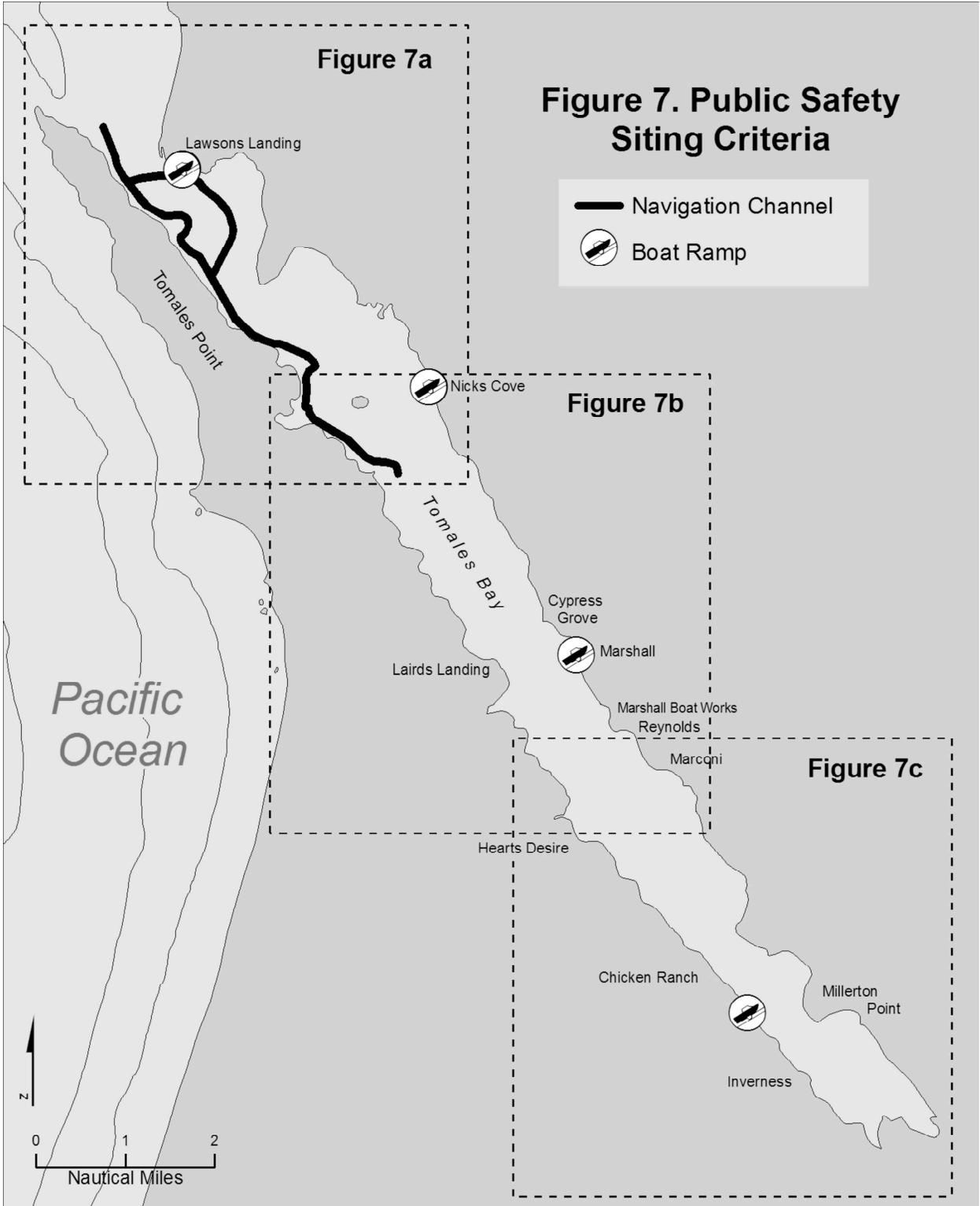


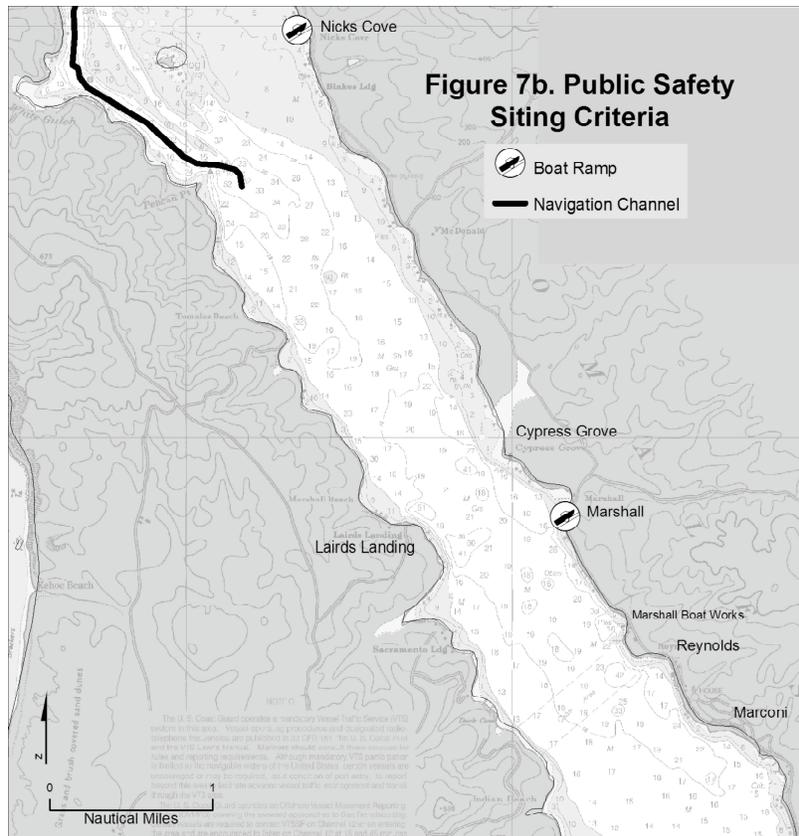
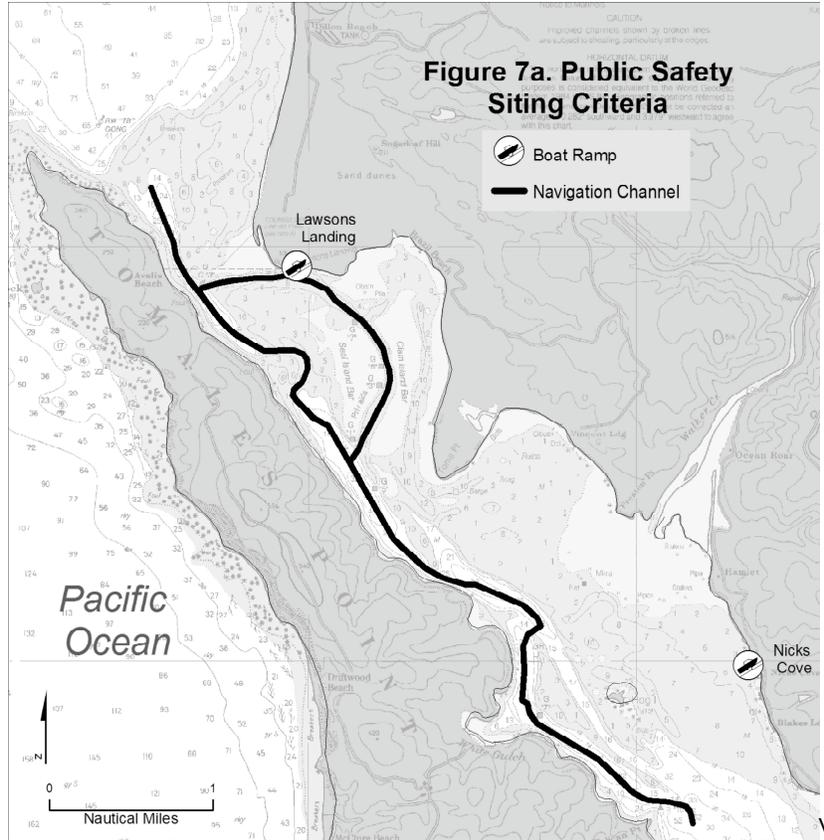


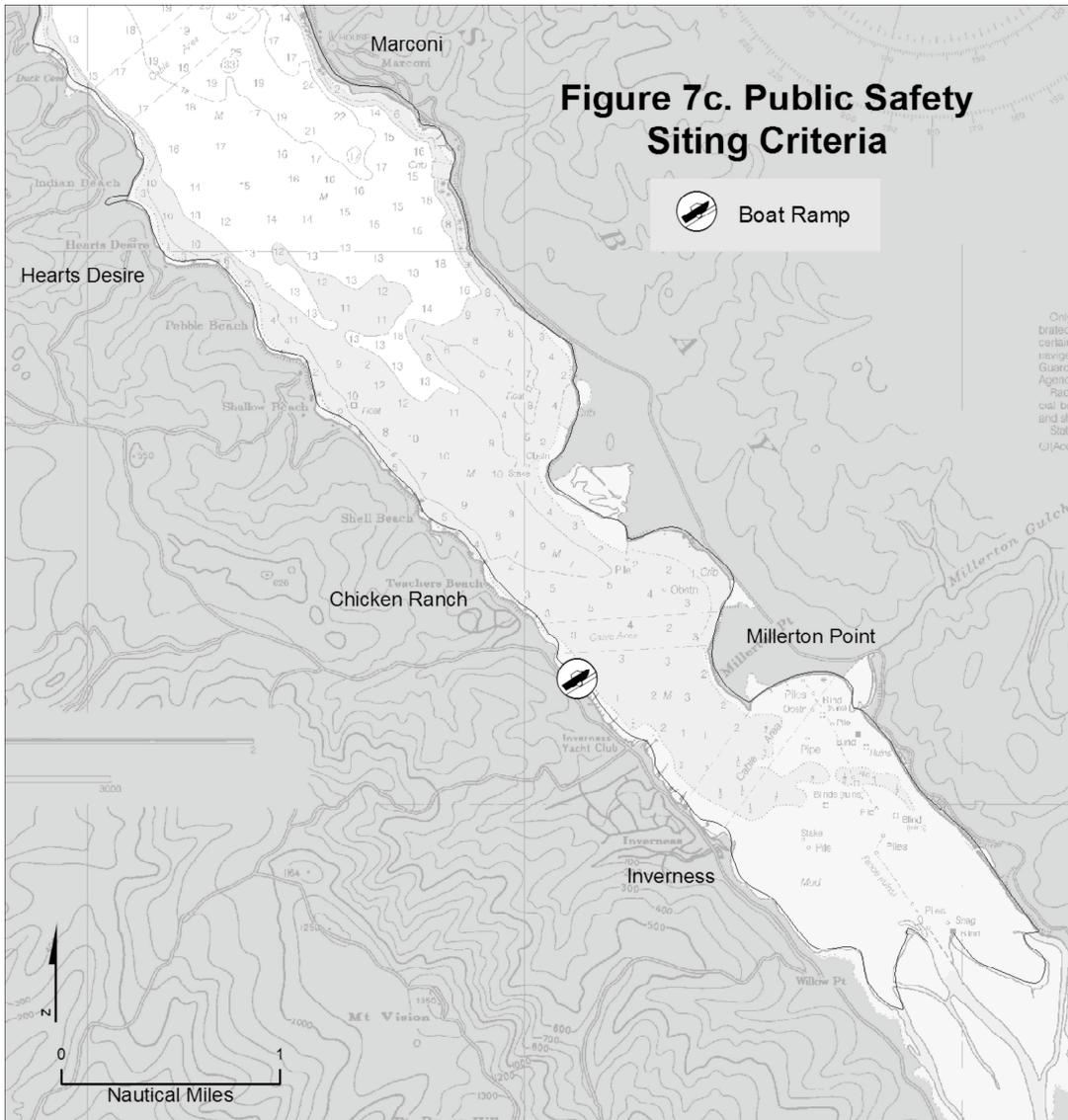
(c) Recreation and Public Safety Protection

- **Navigation Channels:** There are two identified navigation channels in Tomales Bay. These areas serve as important avenues of vessel movement around the shallow Bay. In order to ensure public safety and protect vessel navigation, these areas, along with a 100-foot buffer on the channels, are recommended to be excluded to moored vessels.
- **Vessel Ramps:** There is one public vessel launch area in Tomales Bay. A 100-foot buffer zone around the launch area is included to ensure safe access to the ramp.





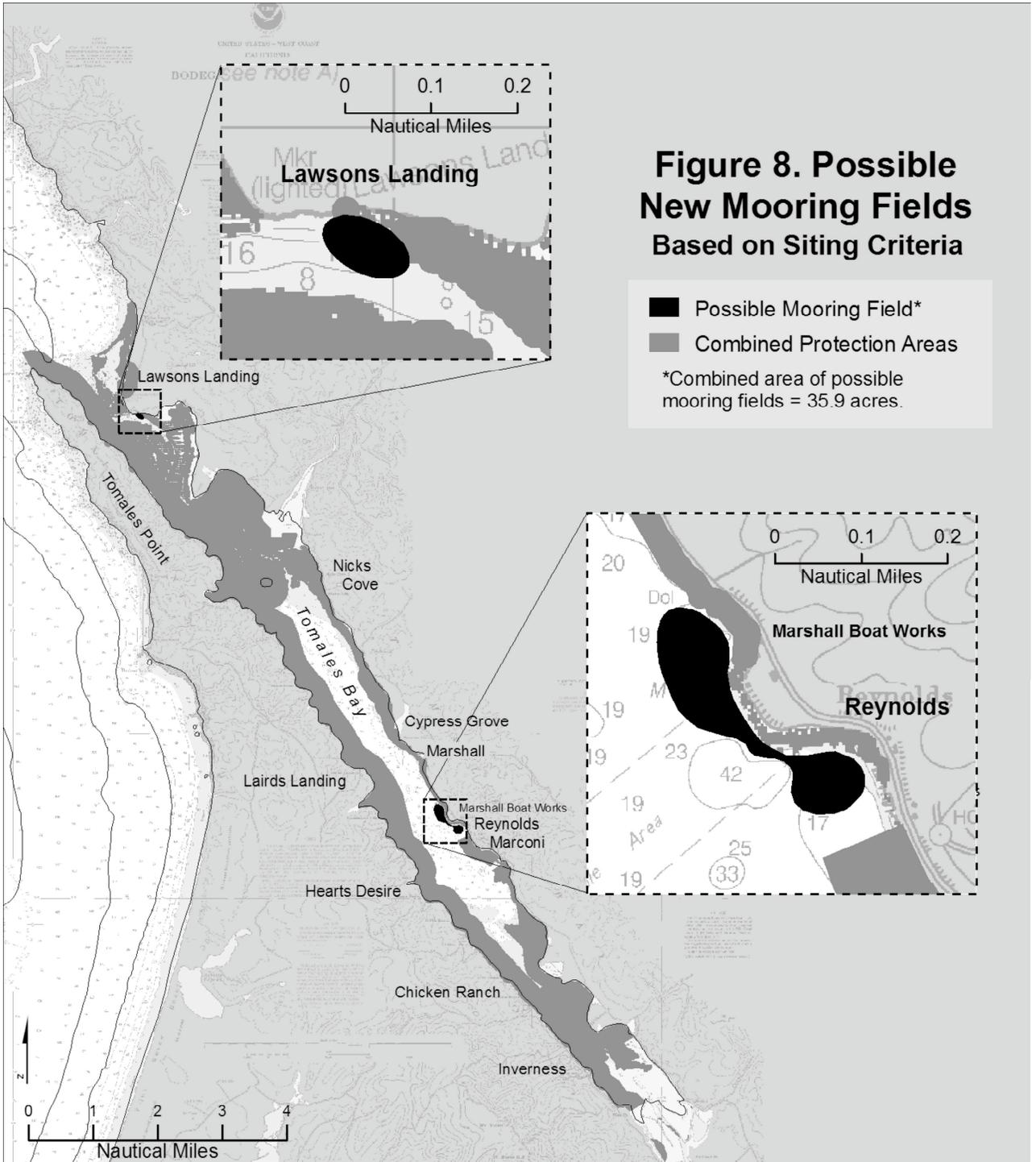




**b. Alternative to create mooring fields**

Although installing moorings is prohibited by the regulations of the GFNMS and PRNS, the agencies involved in the development of this document determined that possible accommodation of moorings should be made to address the need for safe and enjoyable water-related recreation. Mooring areas that do not impact sensitive habitat or wildlife or degrade water quality and the natural resources of Tomales Bay could be established. In an analysis of the mooring siting criteria, participating agencies identified certain areas that could be set aside as mooring fields in which appropriate moorings will be constructed.

Two potential mooring fields have been identified: one at Lawson's Landing and one at Reynolds. These potential mooring fields are shown in Figure 8.



Environmental review will be required to consider potential impacts associated with these options, as well as their feasibility. In addition, the Committee developed the following guidelines for evaluation of mooring sites in order to develop a Vessel Management Plan:

- Evaluate the need for moorings including number, size and type of vessels, including appropriate length of stay;
- Recommend potential options for mooring locations – considering protection criteria and considering no anchorage and no motor zones;
- Discuss potential issues associated with vessel management and mooring alternatives including: (1) needs and patterns of current moored vessels in Tomales Bay; (2) cost/feasibility of different alternatives; (3) physical features of Tomales Bay that affect alternatives; (4) types of moorings to consider including day-use, or extended stay; and
- Preparation of appropriate environmental review documents (e.g. CEQA and/or NEPA) evaluating the possible alternatives with state and federal agencies as co-lead.

### **c. Alternative for Individual Mooring Installations**

This alternative involves allowing for individual moorings to be placed throughout the areas of Tomales Bay that are not within the criteria identified in this document in section VII (2) a. using an individual mooring permit system. Agencies with jurisdiction over the submerged lands, holding or waters of Tomales Bay could develop specific additional criteria to determine whether or not to authorize, approve, or permit a mooring installation in a particular area of the Bay that may not be one of the proposed mooring fields. These agencies include, but are not limited to, CCC, CDPH, SLC, CSP, GFNMS, and NPS. The agencies could work collaboratively to create a streamlined and efficient process for evaluating the number of mooring installations that will be authorized. The review by specific agencies will be determined by the location of the proposed mooring installation and the relevant authority or jurisdiction in that locale.

These criteria will include but not be limited to the following considerations:

- (1) the total number of moorings that the authorizing agencies determine will be allowed in the Bay based on a consideration of impacts on water quality, public health, safety, and recreational use;
- (2) an assessment of the need for the proposed mooring;
- (3) the type of vessel to be moored;
- (4) other options available for storage of the vessel;
- (5) the location of the proposed mooring; and
- (6) whether the moored vessel can be maintained in a manner that protects the water quality, natural resources, and public safety, and recreational uses within the Bay.

**d. Alternative to Increase Dry Vessel Storage.**

When illegal moorings are removed, vessel operators will need to find alternative storage options for their vessels. Dry vessel storage is an environmentally sound storage alternative to mooring. Storing vessels out of the water decreases the potential for discharges of oil, fuel, sewage and toxic vessel maintenance products and the release of toxic fungicides (often a source of copper discharges) contained in bottom coatings.

There are certain limitations presented by increasing dry vessel storage. One problem is that many vessel owners that currently moor their vessels may not own trailers that are needed to move vessels from water to dry storage. Another limitation is that additional dry storage would need to be sited in areas that are convenient for vessel owners. Siting dry storage at existing launch ramp sites and providing trailers or vessel lifts to assist boaters in moving their vessels between the water and storage facility is an alternative that should be considered.

Entities seeking to site new development on land adjacent to Tomales Bay are likely to need permit approval for any new development on land from the CCC and a lease from the SLC for any in-water development.

Private parties or government agencies interested in siting vessel storage facilities may be able to obtain grants for improvements to marine facilities and vessel launch ramps through the DBW. Funding options include the following:

Vessel launching facility grants

Public agencies can apply for grants for the construction or improvement of vessel launching ramps and ancillary facilities through the Harbors and Watercraft Revolving Fund (H&WRF). The Department grants funds to cities, counties, and other governmental agencies, including the Federal Government, for the planning and construction of vessel launching facilities, floating restrooms, and vessel sewage pumpout facilities. The launching facility development program provides grants for the construction of launching lanes, restrooms, boarding floats, shore protection, car-and-trailer parking, utilities, landscaping and irrigation, and ancillary items. The amount of funds provided is determined by the use and benefits that can be economically justified.

The facilities constructed with DBW grants must be in environmentally acceptable areas, meet or exceed DBW design criteria, be economically feasible, and remain open to all boaters at reasonable prices. In return for this funding, grant recipients are responsible for operating and maintaining the project for a minimum of 20 years at no additional cost to the state.

Small craft harbor development loan

DBW also lends money to public and privately owned marinas. Loan funds are available to public entities for planning, construction, rehabilitation or expansion of small craft

harbors throughout California. Berthing is one of the improvements that the Department will fund.

Privately owned and operated marinas

DBW also has construction loan funds for recreational marinas. These funds can be used to construct, expand or improve privately owned boating facilities that are open to the public. These construction funds can be used for: berthing, restrooms, vessel pumpout stations, utilities, riprap and erosion control, vehicle/trailer parking, launching facilities, dry vessel storage facilities, breakwaters, and other boating related facilities.

**(3) Additional Actions – Boater Education**

In addition to current actions taking place (described above) and proposed actions to address vessel sewage and mooring, the Committee has determined that additional actions are needed to provide (1) a coordinated enforcement strategy; and (2) an education component for vessel operators in Tomales Bay to increase awareness of potential threats from deserted vessels, the fines and penalties associated with deserting vessels, and the fines and penalties associated with release of hazardous materials from deserted vessels. Enforcement actions anticipated by the agencies are discussed in the next section.

The participating agencies recommend implementation of a coordinated effort to educate day visitors and resident vessel operators in the Tomales Bay region to address the following management concerns of this document, including preventing:

- a) introduction of invasive species
- b) disturbance of wildlife
- c) habitat destruction
- d) discharges of sewage, oil, fuel, and vessel maintenance products
- e) vessel registration
- f) seagrass protection
- g) derelict vessels

Successful boater education depends on multi-media outreach efforts (California Coastal Commission, 2004). Such efforts include signage at vessel launch ramps, marinas, fueling facilities, and other commercial outlets visited by boaters. Education can also target boaters in publications widely read by boaters. Pamphlets, brochures, and fact sheets are best used in conjunction with peer visits, such as the Dockwalker program, operated by the California Coastal Commission. All of these outreach modes should be considered in developing a boater education targeting vessel operators in Tomales Bay.

**a. Prevent the Introduction of Invasive Species**

The sanctuaries intend to further prevent injury to sanctuary resources and to protect the integrity of the marine ecosystem by preventing the intentional introduction of invasive

species into the marine environment. A new regulation is proposed to prohibit introducing or releasing introduced species from within or into the three sanctuaries (15 CFR 122, Federal Register/ Vol. 71, No. 195). The proposed regulatory changes would prohibit releasing or otherwise introducing into the GFNMS (which includes Tomales Bay) an introduced species, with the exception of: (1) striped bass released during catch and release activities, and (2) species cultivated by mariculture activities within Tomales Bay pursuant to an existing valid lease or authorization by the State. Although this regulation would not be completely effective in preventing the accidental release of introduced species, the regulation would provide a deterrent to deliberate releases and could help prevent introductions associated with specific planned programs or projects.

An “introduced species” is defined generally in the proposed regulations as one that is non-native to the ecosystems protected by the Sanctuary. The prohibition is designed to help reduce the risk from introduced or invasive species to protect the biodiversity of the Sanctuary ecosystems. Introduced species may become a new form of predator, competitor, disturber, parasite, or disease that can have devastating effects upon ecosystems. The problem of invasive species is discussed in greater detail in section III.

In terms of vessel management, vessel operators can prevent the introduction of invasive species by following these best management practices:

- Drain live wells, bilge water, and transom wells before leaving the vicinity of where you have used your vessel.;
- After leaving the water, inspect your vessel and vessel accessories, and dispose of any plants or animals you find by placing them in the garbage bin;
- Empty bait buckets on land, never into the water;
- Never dip your bait or minnow bucket into the Bay if the bucket contains water from another body of water;
- Never dump live fish or other organisms from one body of water into another one;
- When you get home, wash your vessel, tackle, downriggers, and trailer with hot water; and
- Flush water through your vessel motor’s cooling system and other parts of the vessel that normally get wet -If possible, let everything dry for five days in the hot sun before using your vessel in another body of water.

*(adapted from California Coastal Commission, 2004)*

Vessel operators in Tomales Bay should employ these practices in order to prevent the introduction of non-native species. The Final Vessel Management Plan should include a boater education strategy that will increase awareness of vessel operators in Tomales Bay regarding these best management practices.

#### **b. Prevent Disturbance of Wildlife and Habitat Destruction**

Participating agencies will develop recommended practices for boaters to limit the disturbance of wildlife and destruction of habitat in Tomales Bay. These

recommendations should be location specific and suggest areas and practices to be avoided. Boaters should be educated to be sensitive to wildlife rest periods, nesting sites, and haul-out areas. In particular, boaters should be instructed to avoid Hog Island, Pelican Point and tidal sand bars north of Toms Point. In terms of habitat protection, seagrass beds will be protected if prohibitions on anchoring in seagrass beds are adopted. However, boaters also should be educated to avoid marshes and shallow waters. Maps should be provided to boaters to identify areas that are of particular concern in terms of wildlife disturbance and habitat protection. Maps should include specific instructions about vessel operation. Interpretive signs in these areas may also direct vessel operators about best practices for wildlife and habitat protection.

### **c. Prevent Discharges of Sewage, Oil, Fuel, and Boat Maintenance Products from Vessels**

Participating agencies will develop a boater education program to promote the use by boaters in Tomales Bay of best management practices for preventing the discharges of sewage, oil, fuel and vessel maintenance products. The best management practices published by the California Coastal Commission in the *California Clean Marinas Toolkit* (2004) suggest many practices related to:

- Preventing overboard discharge of untreated sewage;
- Preventive engine maintenance;
- Bilge care and preventing oily discharges from the bilge;
- Spill-proofing oil changes;
- Recycling used motor oil;
- Using safe spill-proof fueling practices;
- Reporting oil and chemical spills;
- Reducing use of toxic vessel cleaning products;
- Spill-proofing vessel cleaning and maintenance activities;
- Minimizing emissions from surface preparation in painting and varnishing activities;
- Choosing less toxic hull paints and anti-fouling strategies; and
- Using environmentally sound hull cleaning practices.

The *Toolkit* provides fact sheets for boaters and strategies for boater education. These materials and others should be adapted and used in developing an outreach program to educate resident vessel operators in the Tomales Bay area as well as visiting vessel operators.

The following table breaks down these proposed actions and identifies the agency responsible:

<b>Recommended Action Item<sup>4</sup></b>	<b>Agency</b>	<b>Authorizing Legislation, Policy or Regulations</b>
2. Sewage waste management actions	SF RWQCB	San Francisco Bay Basin Plan and Porter Cologne Water Quality Protection Act
3. Develop mooring and dry vessel storage options for the protection of Bay water quality, natural resources, and public health and recreational opportunities, including: <ul style="list-style-type: none"> <li>• Removal of all illegal moorings,</li> <li>• Propose for public comment three strategies for accommodating moorings and/or storage needs: (1) developing mooring fields, (2) consideration of mooring installations on a case by case basis, and (3) increasing dry vessel storage.</li> </ul>	a. GFNMS b. Lead Agencies will be determined upon publication of the Vessel Management Plan.	a. Regulations: 15 CFR, Part 922, subpart H. b. Authorities, laws, regulations of the lead agencies will be determined.
3. Establish seagrass protection zones	GFNMS	Proposed regulation from the Draft Environmental Impact Statement of the Joint Management Plan Review, October 2006.
1. Remove existing derelict and abandoned vessels and control future abandonment through enforcement	County of Marin	Boating and Waterways, Harbors and Navigation Code
2. Initiate education and outreach program re: <ul style="list-style-type: none"> <li>a. habitat and wildlife protection</li> <li>b. invasive species</li> <li>c. abandoned vessels</li> <li>d. discharges of oil, fuel and vessel maintenance products</li> <li>e. vessel registration</li> <li>f. seagrass protection</li> </ul>	All	N/A

<sup>4</sup> Any modification to action 1, 2(a), 3 or 4 will be made by the agency listed in the table. These actions are not being proposed for adoption through the *Plan*.

## **VIII. ENFORCEMENT STRATEGY**

Agencies recognize that protection of water quality, natural resources and public safety requires sufficient enforcement of existing laws and regulations. The agencies have considered how best to coordinate the existing authorities, efforts, and resources to implement the overall goals of this document. Below is a discussion of the short-term and long-term strategy for ensuring appropriate implementation and enforcement of the elements contained in this document.

### **A. Short-Term Enforcement Strategy**

Appropriate agencies will coordinate their efforts to ensure that applicable enforcement actions will be taken in the following order of priority:

1. Remove derelict vessels posing greatest threat to public safety, natural resources, and water quality of Tomales Bay;
2. Remove derelict and abandoned vessels and moorings in Tomales Bay;
3. Remove new moorings;
4. Encourage boater registration and verify registration of existing vessels;
5. Improve cross-agency cooperation and coordination to maximize use of existing enforcement personnel;
6. Seek funding to assist with removal of identified vessels and moorings; and
7. Implement public education and outreach strategy regarding derelict and abandoned vessels and moorings.
8. Prevent anchoring in seagrass beds.

The removal of moorings or other unpermitted development may require a Coastal Development Permit (CDP) from the CCC, or other CCC action, as appropriate. If GFNMS regulations are adopted to prohibit anchoring in seagrass protection zones, then participating agencies will seek to create enforcement authority for the Marin County Sheriff's Office. A new County ordinance creating such enforcement authority may need to be enacted.

### **B. Long-Term Enforcement Strategy**

A long-term enforcement strategy must support a Final Vessel Management Plan and any proposed changes to vessel management guidelines, permitting restrictions and/or vessel facility requirements. Without knowing the specifics of the Final Vessel Management Plan, the exact enforcement strategy cannot yet be determined. However, at a minimum, the coordinating agencies plan to perform the following:

- A Memorandum of Agreement (MOA) among the primary agencies involved in the enforcement of boating operations in Tomales Bay.

- An analysis of enforcement capability of each of coordinating agencies to determine: number and type of enforcement officers; need for cross-deputization; and public education materials needed.
- A patrol schedule on land and water that supports identified permitting and enforcement needs.
- By January 2009, cooperating agencies will have developed a MOU identifying the process for approving waste facility management plans for proposed expansion of existing facilities or development of new facilities.

**LIST OF ACRONYMS**

CCC	California Coastal Commission
CDFG	California Department of Fish Game
CDPH	California Department of Public Health
CFR	Code of Federal Regulations
CSP	California State Parks
DBW	California Department of Boating and Waterways
GGNRA	Golden Gate National Recreation Area
GFNMS	Gulf of the Farallones National Marine Sanctuary
JMPR	Joint Management Plan Review
MPWC	Motorized personal watercraft
MSD	Marine sanitation device
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
PRNS	Point Reyes National Seashore
RWQCB	Regional Water Quality Control Board
SLC	State Lands Commission
TMDL	Total Maximum Daily Load
U.S. EPA	United States Environmental Protection Agency

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