

**REVIEW OF HARBOR SEAL AND HUMAN INTERACTIONS
IN DRAKE'S ESTERO, CALIFORNIA**

MARINE MAMMAL COMMISSION

TERMS OF REFERENCE

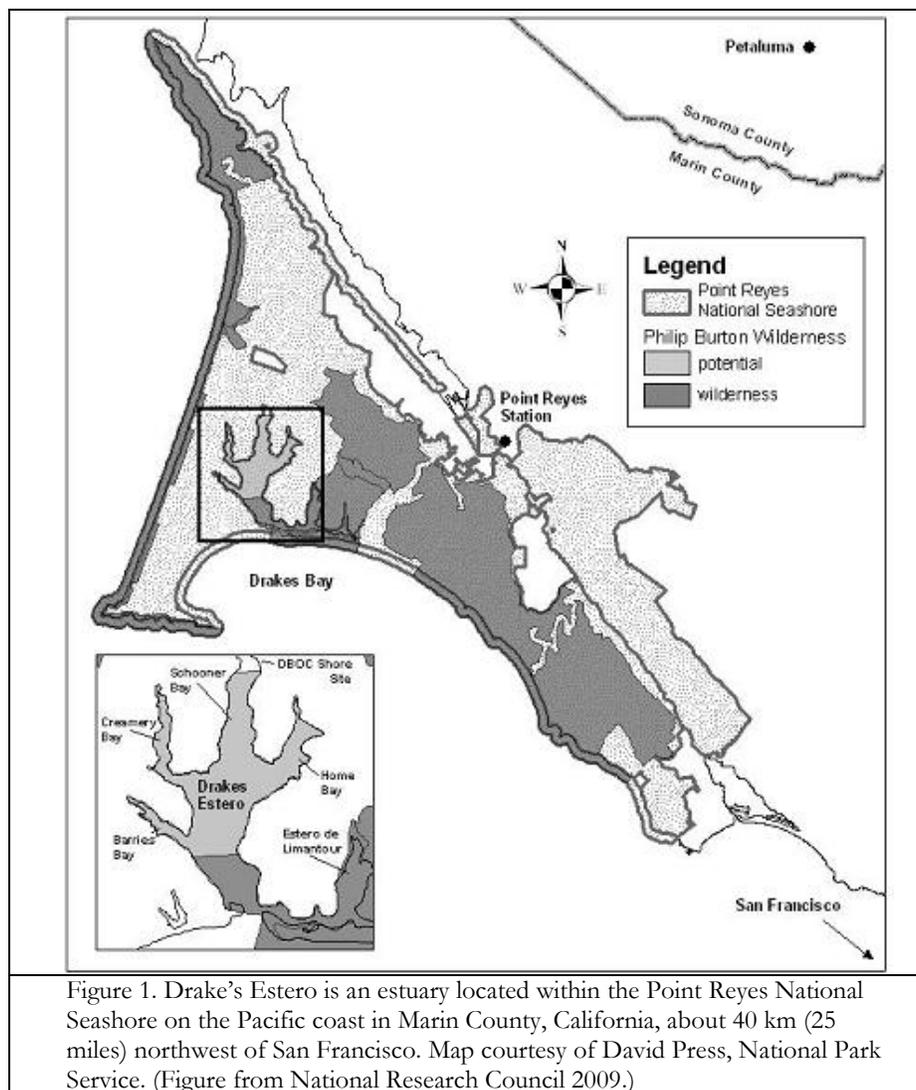


Drake's Estero, Point Reyes National Seashore, California (photo by Robert Campbell)

PROBLEM STATEMENT

For several decades, central California has witnessed a debate about the potential effects of certain human activities on the harbor seal population in Drake's Estero. The estero is located within Point Reyes National Seashore (Figure 1, from National Research Council 2009), which is managed by the U.S. National Park Service in concert with the California Department of Fish and Game and other federal and state agencies. For various reasons, the debate has focused on the potential effects of aquaculture operations on the estero's harbor seal population, although other human activities also affect this population. The purpose of this review is to conduct a detailed assessment of the sources of harbor seal disturbance in and around Drake's Estero and, where uncertainty remains, recommend scientific study and management measures to clarify and avoid such effects.

GENERAL BACKGROUND



Harbor Seals

Harbor seals inhabit nearshore and estuarine areas from Baja California to Alaska. They do not migrate extensively but, on occasion, may travel 300 to 500 km to find food (Herder 1986). The seals haul out year-round to rest, breed, and molt on sandbars, rocky outcrops, and offshore islands along the coast. Location and timing of seal haul-out patterns vary with a range of factors, including seal reproductive condition, time of day, tide level, current direction, weather, season, year, occurrence of disease, presence of other wildlife, and human activities (Allen et al. 1984, Yochem et al. 1987, Suryan and Harvey 1999, Thompson et al. 2001, Grigg et al. 2004, Hayward et al. 2005, Seuront and Prinzivalli 2005).

Human activities prior to the mid 1900s substantially depleted harbor seals in California. Following passage of the Marine Mammal Protection Act of 1972 the population began to recover. The most recent stock assessment report for California harbor seals notes that “[n]et production rates appeared to be decreasing from 1982 to 1994...[and] the decrease in population growth rate has occurred at the same time as a decrease in human-caused mortality and may indicate that the population is approaching its environmental carrying capacity” (Caretta et al. 2008). At present, the stock assessment report suggests that the total California population is just over 34,000.

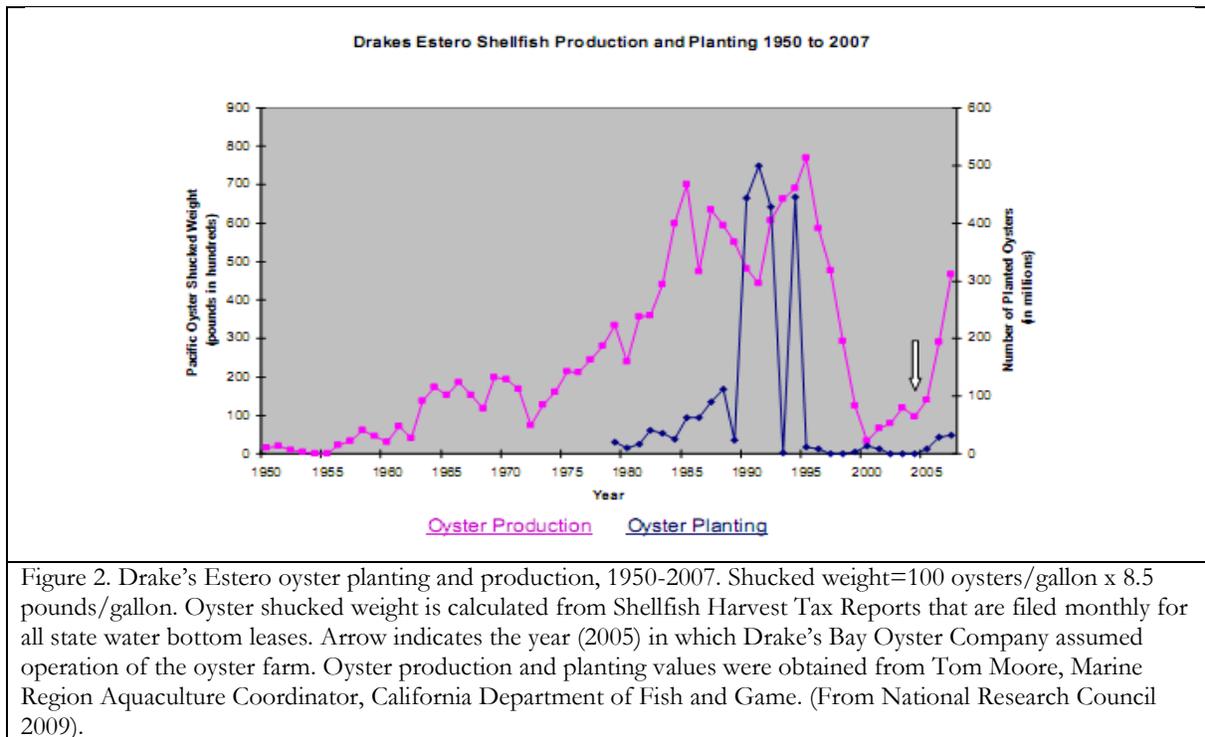
About 20 percent of the California stock occurs in the Point Reyes area (Lowry et al. 2005). The number of seals hauled out in the estero generally is greatest during the spring/summer breeding and molting seasons. The maximum count in Drake's Estero is about 1,800 seals and the estero population produces about 200 to 400 pups per year (National Park Service 2004).

Human-related Risk Factors

The number of harbor seals at any one time is a function of both natural and human-related risk factors. Human-related risk factors that may affect harbor seals in Drake's Estero include, but are not limited to, the following.

Aquaculture: Since 1934 a variety of shellfish, including Pacific oysters, European flat oysters, Olympia oysters, Kumamoto oysters, Manila clams, purple-hinged rock scallops, and bay and sea mussels have been cultured in or harvested from Drake's Estero. Currently, the Drake's Bay Oyster Company grows Pacific oysters and Manila clams. Pacific oysters are not known to spawn independently at the water temperatures heretofore characteristic of the estero. The company both produces oyster seed on site to reduce the chance of introducing non-native invasive species and uses additional seed from other hatcheries. The company also has plans to produce purple-hinged rock scallops and may seek permission to produce Olympia oysters in the future. Oyster production numbers, provided by the California Department of Fish and Game, are depicted in Figure 2 (National Research Council 2009).

Kayaks and canoes: Drake's Estero is closed to all motorized boats except those of the Drake's Bay Oyster Company and, on occasion, those used for emergencies such as search and rescue. Kayaks and canoes may be used in most of the estero except between 1 March and 30 June, which is the peak season for harbor seal pupping. Although they generally are small and quiet, kayaks and canoes may disturb seals both in the water and hauled out on land (Henry and Hammill 2001). National Park Service records confirm that kayaks and canoes are sources of harbor seal disturbance.



Hiking and horseback riding: Hikers and riders are allowed to use trails in Point Reyes National Seashore year-round. These visitors are known to use the estero beaches and can approach or access several of the harbor seal haul-out sites in the estero and adjacent areas such as Estero de Limantour and Drake's Beach. National Park Service records indicate that hikers and riders are sources of disturbance, and the National Park Service posts signs provided by the National Marine Fisheries Service quoting regulations and providing guidance to prevent such disturbance.

Disease and contaminants: Intermittent agricultural run-off may introduce contaminants or disease into the estero. No contaminant- or disease-related effects have been documented and a detailed study of samples from the late 1980s did not find evidence of excessive contaminants in the estero (Anima 1991). However, to avoid contamination of its oysters, Drake's Bay Oyster Company monitors water quality in the arms of the estuary and adjusts its activities based on the potential for contamination from run-off. In addition, 22 pups stranded and died of unknown causes on Drake's Beach in 2008 (Marine Mammal Center Stranding Records, *unpublished*), and potential effects of disease and/or contaminants have not been ruled out.

COMMISSION REVIEW

Various aspects of aquaculture operations in Drake's Estero have been reviewed at local (i.e., Marin County Board of Supervisors), state (i.e., California Coastal Commission), and federal (i.e., National Park Service, National Research Council) levels. In 2009 the National Research Council completed

the most recent review, which focused on the effects of aquaculture on the various ecological elements of the estero. The report from that review stated that—

Statistical analyses of Drakes Estero harbor seal count data during the breeding season suggest a possible relationship between mean counts at two of three subsites where seals haul out on sand bars in the upper estero and the combined signals from the 1998 El Niño and oyster production level.

The report also noted that—

No studies have determined whether short-term responses to disturbance have long-term population consequences for harbor seals....

Finally, the report noted that review results—

highlight the need for a more detailed assessment of the extent to which different disturbance sources may impact harbor seals both on land and in the water....

Request for Commission Review: The National Park Service originally brought this matter to the attention of the Marine Mammal Commission in May 2007. Independently, the Service and a representative of the Drake's Bay Oyster Company periodically updated the Commission on this matter over the following two years. On 9 June 2009 the National Parks Conservation Association and Sierra Club wrote to the Marine Mammal Commission requesting that the Commission review the findings of the 2009 National Research Council report to—

clarify for the public and policy makers the extent of concern that exists from oyster operations on harbor seals, as well as the application of applicable policies and use of the precautionary principle in management implementation.

Commission Response: The Commission responded on 1 July 2009, indicating that it would review "...these circumstances and their implications for harbor seal conservation." The Commission's decision was based on its belief that "within the context of its duties set forth in the Marine Mammal Protection Act . . . it may have a useful role to play in this situation."

Review Goal and Objectives: The Commission agreed to conduct the review based on its primary concern that the harbor seals using the estero be protected from human activities in accordance with the Marine Mammal Protection Act. The Commission believes that protecting those harbor seals and their habitat will require ongoing vigilance by resource managers and those who engage in activities in or around the estero.

In conducting its review, the Commission will (1) use the best available scientific information regarding human impacts on harbor seals in the estero; (2) evaluate the strengths and weaknesses of those data, including information gaps, and (3) recommend research and management activities to reduce scientific uncertainty and ensure the protection of harbor seals and their habitat. To make informed recommendations regarding management of the harbor seal population, the Commission

also will review the National Park Service's existing protection measures, including those contained in the 1992 "Record of Agreement Regarding Drake's Estero Oyster Farming and Harbor Seal Protection." The Commission will solicit, consider, and seek to address the viewpoints of all stakeholders in a transparent and constructive manner but will maintain its focus on scientific issues involving potential effects on harbor seals and management measures that are in place or that may be necessary to address those effects.

Review Process and Timeline:

Activity	Completion Date
Commission will establish and convene an internal steering committee	Completed
Steering committee will complete a draft Terms of Reference for the review	Completed
Steering committee will identify candidates for the review panel	Near Completion
Steering committee will obtain all research data from the National Park Service and other parties involved and the Service's management plan	December 2009 – January 2010 (in process)
Commission staff will organize data received for the review panel	January 2010 (in process)
Review panel members will familiarize themselves with the pertinent data and documents	January – February 2010
Commission will convene a review panel meeting at or near Point Reyes National Seashore	21-24 February 2010
Each review panel member will submit an independent written report to the Commission	February – May 2010
Commission will produce and distribute a final review report	June 2010

Steering Committee: The steering committee consists of—

- John Reynolds, Ph.D., Chair, Marine Mammal Commission
- Vera Alexander, Ph.D., Commissioner
- Paul Dayton, Ph.D., Commissioner
- Michael Gosliner, Esq., General Counsel
- Timothy Ragen, Ph.D., Executive Director
- Samantha Simmons, Ph.D., Assistant Scientific Program Director

Proposed Panel Members*:

Peter Boveng, Ph.D., National Marine Mammal Laboratory
 Sean Hayes, Ph.D., National Marine Fisheries Service
 Steven Jeffries, Washington Department of Fish and Wildlife

Robert Small, Ph.D., Alaska Department of Fish and Game
Michael Walsh, D.V.M., University of Florida

* The Commission is considering the inclusion of two additional panel members.

Panel Review: The panel review will consist of a four-day meeting at or near Point Reyes National Seashore including—

- a one-day site visit to Drake's Estero to tour the oyster farm, observe the estero from the National Park Service's site for obtaining data pertaining to harbor seals, and visit the harbor seal haul-out sites and the sites where oyster racks and bags are placed;
- one day of invited presentations from involved parties including National Park Service, Drake's Bay Oyster Company, Dr. Corey Goodman, California Department of Fish and Game, California Coastal Commission, Sierra Club, and National Parks Conservation Association. Presentations are to address only the strengths and weaknesses of existing data, and current information gaps. Presentations and other meetings except the visit to the estero will be open to the public and, except as noted below, will be followed by an opportunity for public comment;
- one day for the panel to review and discuss the data and presentations. This meeting will be open to the public; a public comment period may be provided, but public participation in the discussions is not anticipated; and,
- if needed, one day for further discussion in public session or to revisit the estero. After the meeting is adjourned, individual panel members may begin drafting their reports.

Panel Reports: Each panel member will submit an individual report to the Commission. In general, the report will specify the member's views of the strengths and weaknesses of the existing data, any conclusions to be drawn from the existing data, important gaps in the existing data, and recommendations for future study and/or management measures. The reports also will address any specific questions identified by the Commission and/or the panel members during the course of the review.

Commission Report: The Commission will prepare its report based on its review of the reports of the individual panel members, each of which will be appended to the final report. The report will be submitted to all parties involved in the review and made available to the public. It will highlight the same topics discussed in the individual reports of the panel members.

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