

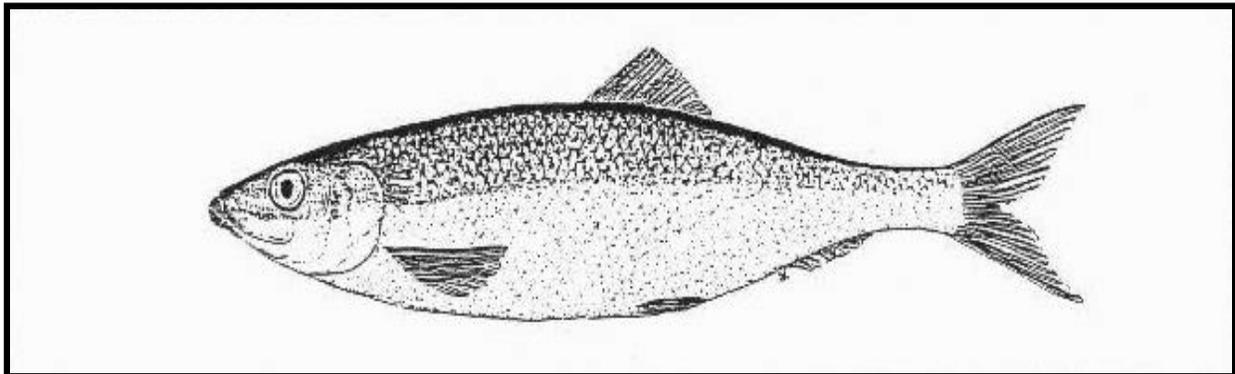
SCH No. 98052052

FINAL

SUPPLEMENTAL ENVIRONMENTAL DOCUMENT

**PACIFIC HERRING
COMMERCIAL FISHING REGULATIONS**

(Sections 163, 163.1, 163.5, and 164, Title 14, California Code of Regulations)



**2008
STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF FISH AND GAME**

**FINAL SUPPLEMENTAL ENVIROMENTAL DOCUMENT
PACIFIC HERRING COMMERCIAL FISHING REGULATIONS**

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SUMMARY

S.1 Introduction

This Final Supplemental Environmental Document (FSED) to the Final Environmental Document (FED), Pacific Herring Commercial Fishing Regulations, 1998, provides the review and analysis required by California Environmental Quality Act (CEQA) Guidelines (Section 15000 et seq., Title 14, California Code of Regulations [CCR]). The review and analysis will assist the California Fish and Game Commission (Commission) in regulating the commercial harvest of Pacific herring throughout the State's ocean and estuarine waters. Specifically, the FSED reviews and evaluates proposed regulatory changes for the 2008-09 fishing season, supplementing, and in some cases replacing, aspects of the proposed project described in the 1998 FED and the FSED of 1999, 2000, 2001, 2002, 2004, 2005, 2006, and 2007. A Notice of Preparation (NOP) was used to identify and incorporate concerns and recommendations of the public, resource and regulatory agencies, and the fishing industry into the review and analysis of the proposed changes contained in these documents.

The FSED includes seven chapters. Chapter 1 discusses the authorities and responsibilities under which the Final Supplemental Environmental Document (FSED) was developed and describes its intended use. Chapter 2 describes the proposed project and alternatives and options for regulating the commercial harvest of herring. Chapter 3 describes the existing environment where the California herring fisheries occur. Chapter 4 addresses the impacts of the proposed project and cumulative effects. Chapter 5 describes the impacts of the alternatives to the proposed project. Chapter 6 identifies consultations with other agencies, professionals, and the public. Chapter 7 responds to public comments regarding the proposed project.

The proposed project has been selected as the preferred alternative based on the analysis of this FSED. The proposed project is identified as the preferred alternative because it provides a set of regulations most likely to achieve the CEQA requirements

with respect to the conservation, sustainability, maintenance, and utilization of the Pacific herring resource.

S.2 Proposed Project

The proposed project is a body of regulations governing the commercial harvest of herring for roe products, bait, pet food, as fresh fish, and the harvest of herring eggs-on-kelp. The proposed project takes the form of recommendations for continuation, amendment, or change to an existing body of regulations in effect since November 2007 (Sections 163, and 164, Title 14, CCR). It also includes regulations from Section 163.1 (herring permit transfers) and 163.5 (penalties in lieu of suspension or revocation-herring permittees), Title 14, CCR that were adopted by the Commission on March, 2006 and October 2002, respectively.

The proposed regulatory changes will establish fishing quotas for San Francisco Bay for the 2008-09 herring fishing season, based on the most recent assessments of the spawning populations. Previously established quotas for Tomales Bay, Humboldt Bay, and Crescent City Harbor fisheries are not affected by these regulatory changes.

The specific regulatory changes proposed for the 2008-09 season will:

(1) provide the Commission the option to consider a quota equal to 0-10% of the most recent spawning biomass estimate (the Department's recommendation is 1,118 tons - 10 percent of the 2007-08 spawning biomass); (2) set the dates of the roe herring fisheries in San Francisco Bay from 5:00 p.m. on December 1, 2008, until noon on December 19, 2008 ("DH" gill net platoon only), and 5:00 p.m. on January 4, 2009, until noon on March 20, 2009; and (3) set the dates of the roe herring fishery in Tomales Bay from noon on December 26, 2008, until noon on February 27, 2009.

S.3 Project Alternatives

Three alternatives are considered in this FSED. These alternatives include: (1) a no-fishery alternative; (2) a no change alternative which uses existing regulations; and (3) establishing individual vessel quotas for gill net vessels in the roe herring fishery. Refer to Section 2.4, Project Alternatives, and Chapter 5 of this FSED, and Chapter 6 of

the 1998 FED, Analysis of Alternatives, for a thorough description of alternatives and analysis of their impacts.

S.4 Existing Environment

The environments most likely to be affected by the regulatory revisions outlined in this FSED are San Francisco Bay and Tomales Bay. Although the proposed project consists primarily of regulatory changes for San Francisco Bay fisheries, the existing environment potentially affected by the proposed project and alternatives also includes the open ocean and other bays in which herring occur. Herring fisheries also occur in the Crescent City Harbor area, Humboldt Bay, and the open ocean, primarily within Monterey Bay. Refer to Section 3.3 of the FED, Specific Biological and Environmental Descriptions, for a thorough description of these environments and Chapter 3 of this document for a description of the environmental setting for these areas.

S.5 Environmental Impacts

S.5.1 Proposed Project

An analysis of the potential impacts of the proposed project is described by this FSED. The FED identified the area with the highest potential for adverse impacts associated with the proposed regulatory changes as the San Francisco Bay area, which supports the largest roe herring fishery in the State. The following localized, short-term, and less than significant impacts were identified in the FED for several areas of potential concern including: (1) boat and vehicle traffic circulation; (2) water and air quality; (3) housing and utilities; (4) geology, scenic quality, recreation; and (5) noise. The FED found biological impacts to have the greatest potential for significant environmental impact, but found these impacts to be localized, short-term, and less than significant, with mitigation provided by the current management strategy and herring population monitoring. Refer to Chapter 4 of the FED for a thorough environmental impact analysis of the proposed project. Any adverse impacts associated with the regulatory changes proposed by this FSED are addressed within this document.

S.5.2 Alternatives

The alternatives proposed in this FSED are the same as those described in the FED. A thorough analysis of the impacts of these alternatives is provided in Chapter 6 of the FED. A summary of impacts associated with these alternatives is provided below.

Alternative 1 (no project)

Localized, short-term, and less than significant impacts to vessel and vehicle traffic circulation, water quality, air quality, housing and utilities, scenic quality, recreational opportunities, and noise levels identified for the proposed project would be eliminated or redistributed in an unpredictable manner.

Alternative 2 (existing regulations)

In most regards, the environmental impacts associated with this alternative would be comparable to those of the proposed project. Although this alternative does provide for an adjustment of quotas and season dates, it does not address certain fishery-related problems considered in amendments or changes to existing regulations. The existing regulation alternative would maintain the herring fishery regulations as amended through 2008 and would not provide for the consistent adaptive management of the State's resources.

Alternative 3 (individual vessel quota)

As addressed in detail within the FED, individual vessel quotas, rather than the platoon-based quota system currently used in the roe herring gill net fishery, could potentially increase impacts due to an increase in the number of days fished. However, these impacts are still expected to be short-term, localized, and less than significant for most environmental categories.

Wastage of resource could result from sorting catches to remove males from the catch or discarding unripe fish to achieve higher roe content, and therefore, higher ex-vessel prices. However, the competition between permittees for a share of the quota is

greatly lessened under an individual quota system and may result in fewer nets likely to be lost, thus reducing impacts from "ghost" net fishing as explained in Section 4.2.6.1 of the FED.

S.5.3 Cumulative

An analysis of the cumulative impacts of the proposed project revealed no additional impacts to those addressed in the FED. The proposed regulatory changes addressed by this FSED are for an existing ongoing project. An analysis of cumulative impacts is provided in Chapter 5 of the FED.

A variety of factors have the capacity to influence Pacific herring population status in California in addition to the proposed project including: (1) biological events; (2) competitive interactions with other pelagic fish and fisheries; (3) oceanographic events; (4) habitat loss; and (5) water quality. However, as with potential impacts from the on-going commercial harvest of herring, continued monitoring of the herring resource and oceanographic conditions should help identify any trends that would signal that the stock's reproductive potential is in jeopardy.

S.6 Areas of Controversy

Status of the herring population in San Francisco Bay has been identified as the only area of controversy regarding commercial herring fishing and is addressed in Chapter 3 of this FSED.

S.7 Issues to be Resolved

At issue is whether or not to provide for commercial fishing as an element of herring management in California. If commercial herring fishing is authorized, decisions to specify the areas, seasons, fishing quotas and other appropriate special conditions under which fishing operations may be conducted are required. As discussed, one aspect of managing this and other fishery resources is the understanding that a no project alternative is considered a management tool. This document, the 1998 FED, the 1999 FSED, the 2000 FSED, the 2001 FSED, the 2002 FSED, the 2004 FSED, the

2005 FSED, the 2006 FSED, and the 2007 FSED include a review and discussion of the proposed project as well as alternatives.

Chapter 1. INTRODUCTION

1.1 Background

This Final Supplemental Environmental Document (FSED) presents the review and analysis necessary to assist the California Fish and Game Commission (Commission), the lead agency pursuant to the California Environmental Quality Act (CEQA), in taking action regarding the regulation of the commercial harvest of Pacific herring (*Clupea pallasii*) in California. It was prepared by the Department of Fish and Game (Department) for the Commission following CEQA Guidelines (Section 15000 et seq., Title 14, California Code of Regulations [CCR]). The project being considered consists of proposed changes to the regulations for the 2008-09 California Pacific herring commercial fishing season.

This FSED was prepared as a supplement to: (1) the Final Environmental Document (FED), Pacific Herring Commercial Fishing Regulations, certified by the Commission in August 1998; (2) the Final Supplemental Environmental Document (FSED), certified by the Commission in August 1999; (3) the FSED, certified by the Commission in August 2000; (4) the FSED, certified by the Commission in August 2001; (5) the FSED, certified by the Commission in August 2002; (6) the FSED, certified by the Commission in August 2004; (7) the FSED, certified by the Commission in September 2005; (8) the FSED certified by the Commission in October 2006; and (9) the FSED certified by the Commission in October 2007. The FED outlines the full proposed project consisting of the operation and management of California's Pacific herring commercial fisheries and can be found on the Department's website at: <http://www.dfg.ca.gov/marine/herring/ceqa.asp>.

The FSEDs of 1999, 2000, 2001, 2002, 2004, 2005, 2006, and 2007 provide for revisions of the proposed project contained in the FED and regulatory revisions necessary for the 1999-2000, 2000-2001, 2001-02, 2002-03, 2004-05, 2005-06, 2006-07, and 2007-08 Pacific herring commercial fishing seasons, respectively. Environmental documents (DSED and FSED) were not prepared for the 2003-04 season. At the close of the 2002-03 fishing season, the Department proposed to

implement a two-year regulatory cycle so that regulatory changes, other than proposed quotas and season dates, would be considered every two years instead of annually. A two-year cycle was designed to relieve the annual burden of detailed review of the herring regulations. This FSED supplements the existing certified environmental documents and provides revisions to the regulations for the 2008-09 Pacific herring commercial fishing season.

The Department and Commission hold the public trust for managing the State's wildlife populations, including herring. That responsibility is fulfilled by a staff of experts in marine resource management and enforcement issues related to California's herring resource. The knowledge and training represented by that expertise qualifies them to perform the review and analysis of the proposed revisions of the commercial herring harvest regulations that are contained in this document.

1.2 The Functional Equivalent

CEQA requires all public agencies in the State to evaluate the environmental impacts of projects that they approve or carry out. Most agencies satisfy this requirement by preparing an Environmental Impact Report (EIR) if there are potentially significant environmental impacts. If no potentially significant impacts exist, a Negative Declaration (ND) is prepared. However, an alternative to the EIR/ND requirement exists for State agencies for activities that include protection of the environment as part of their regulatory program. Under this alternative, an agency may request certification of its regulatory program from the Secretary for Resources. With certification, an agency may prepare functional equivalent environmental documents in lieu of EIRs or NDs.

The regulatory program of the Fish and Game Commission has been certified by the Secretary for Resources. A functional equivalent, Final Environmental Document for Pacific Herring Commercial Fishing Regulations, was certified by the Commission on August 28, 1998. A new FED is required: (1) when subsequent changes are proposed in the project requiring important revisions of the previous FED due to new significant environmental impacts not considered in a previous FED; or (2) when new information

of substantial importance to the project becomes available (Section 15162, Title 14, CCR and Public Resources Code (PRC) Section 21166).

The CEQA lead agency may choose to prepare a supplement to a FED instead of a new FED if only minor additions or changes are necessary to make the previous FED adequately apply to the project in the changed situation. The final supplemental document is given the same notice and public review given to a final environmental document, and may be circulated by itself without the previous FED. The lead agency when deciding whether to approve the proposed project, considers the previous FED as revised by the supplemental environmental document (Section 15163, Title 14, CCR). A Notice of Preparation (NOP) for the Draft Supplemental Environmental Document (DSED) was circulated to interested parties on May 9, 2008. Following the release of the NOP, the 30-day public comment period pursuant to CEQA for the DSED ended June 9, 2008. Pursuant to CEQA regulations, a 45-day public comment period for reviewing the DSED was held from June 13, 2008 to August 8, 2008.

This FSED is the ninth Final Supplemental Environmental Document (FSED) to the FED prepared by the Department. The first FSED was certified by the Commission in August 1999; the second FSED was certified by the Commission in August 2000, the third FSED was certified by the Commission in August 2001, the fourth FSED was certified by the Commission in August 2002, the fifth was certified by the Commission in August 2004, the sixth was certified by the Commission in September 2005, the seventh was certified by the Commission in October 2006, and the eighth was certified by the Commission in October 2007. As provided for by CEQA, the Department will continue to use this method of revising Sections 163, 163.1 (the new section added in December 2005), 163.5, and 164, Title 14, CCR, for a period of approximately five to ten years. After this period, or sooner if deemed necessary, the Department will prepare a new environmental document or a fishery management plan (FMP).

1.3 Scoping Process

The Department invited industry members and interested parties to a town hall meeting held on February 18, 2008, in Sausalito, Marin County. In addition, a Director's

Herring Advisory Committee (DHAC) meeting was held on April 17, 2008, in Sausalito, Marin County. The DHAC consists of 26 representatives from the herring fishery, including buyers and fishermen. They are appointed by the Director and serve at his or her pleasure. Pursuant to CEQA, the Department distributed, for the Commission, a NOP to interested parties on May 9, 2008. This provided a 30-day opportunity for the Lead Agency to obtain information about the scope and content of the DSED from interested federal, state and local agencies as well as the general public.

During the scoping process in past years, several issues were raised that are not included in this FSED including; developing a threshold, harvesting only the fishable biomass, a complete history of the fishery, genetic comparisons of the Tomales and San Francisco populations, the cost of management of the fishery, and establishing a limited voluntary individual quota herring fishery. All of these issues would be better addressed in a Fishery Management Plan (FMP). FMPs are required for all marine fisheries pursuant to the Marine Life Management Act (MLMA). FMPs contain a comprehensive environmental and economic analysis of the fishery along with clear objectives and measures to ensure sustainability of that fishery. In addition to the primary requirements below, the Department seeks advice and assistance in developing FMPs from participants in the affected fishery, marine scientists, marine conservationists, and other interested parties. The primary requirements of an FMP pursuant to Fish and Game Code (FGC) Section 7072 are as follows:

- To the extent practical, each sport and commercial marine fishery under the jurisdiction of other states shall be managed under an FMP. Fishery management plans will be developed in priority order.
- Each FMP shall be based on the best scientific information and other relevant information that is available, or that can be obtained, without substantially delaying the preparation of the plan.
- To the extent that conservation and management measures in an FMP provide guidelines for overall harvest, FMPs shall allocate those increased or restrictions of harvest fairly among sport and commercial fishing interests participating in the fishery.

Specifically, each FMP shall include:

- A summary of the fishery which includes historical data, economic and social information related to the fishery, habitat and ecosystem role of the species, natural history and population dynamics, number of participants, and a history of conservation and management measures affecting the fishery.
- A fishery research protocol that includes past and ongoing monitoring, essential fishery information, identification of additional information, resources and time needed, and procedures for monitoring the fishery and for obtaining essential fishery information.
- Measures necessary for the conservation and management of the fishery which includes limitations of the fishery, creation or modification of a restricted access program that contributes to a more orderly and sustainable fishery, procedures to establish, review and revise a catch quota, and requirements for permits.
- Measures to minimize adverse effects on habitat caused by fishing.
- Information and analysis and amount and type of bycatch if associated with the fishery and measures taken to minimize bycatch and mortality of discards.
- Criteria for identifying when the stock is overfished and measures to address overfishing if occurring.
- A procedure for review and amendment of the plan.

When an FMP is completed it is subject to CEQA and is considered functionally equivalent to an EIR. The current 1998 FED and subsequent FSEDs serve as an interim FMP for Pacific herring until an FMP can be developed.

1.4 Report Availability

This FSED Document is available at depository libraries for each of the counties in the affected areas, at the California Fish and Game Commission office, and California Department of Fish and Game Marine Region offices. It will also be posted on the Department of Fish and Game website at www.dfg.ca.gov/marine/herring/ceqa.asp.

1.5 Authorities and Responsibilities

The California State Legislature formulates the laws and policies regulating the management of fish and wildlife in California. It is the policy of the State to ensure the conservation, sustainable use, and where feasible, the restoration of California's living marine resources for the benefit of all the citizens of the State (FGC Section 7050). It is also the State's policy to promote the development of local fisheries and distant-water fisheries based in California in harmony with international law respecting fishing and the conservation of the living resources of the oceans and other waters under the jurisdiction and influence of the State (FGC Section 1700, Appendix 1 of the FED).

The Legislature provides further policy direction regarding herring management in FGC Sections 8550 et seq. FGC Section 8553, delegated authority from the Legislature to the Commission, whose members are appointed by the Governor, to regulate the commercial harvest and possession of Pacific herring. The remaining FGC Sections relative to herring provide for a limited entry fishery and require periodic review of regulations and policies.

The Commission holds public meetings at its discretion to consider and adopt revisions to these regulations. Recommendations and comments from the Department, other agencies and the public are typically received at two public Commission meetings each year prior to the Pacific herring commercial fishing season. These meetings will be held for the 2008-09 season on August 8, 2008, in Carpinteria and in Kings Beach on September 5, 2008. The authority to prepare a supplemental environmental document is given in PRC Section 21166.

Chapter 2. PROJECT DESCRIPTION

2.1 Project Objectives

The proposed project, as defined in the Final Environmental Document (FED) certified by the California Fish and Game Commission (Commission) on August 28, 1998, is the regulation of Pacific herring fisheries under the State's jurisdiction. The regulations are considered for inclusion in the California Code of Regulations (CCR) to implement the State's policies for managing the commercial use of Pacific herring (Sections 163, 163.1, 163.5, and 164, Title 14, CCR). The proposed project and alternatives addressed in this Final Supplemental Environmental Document (FSED) take the form of recommendations for amendment or change to the existing body of regulations. The recommendations and alternatives are based on biological assessments of existing stock conditions and comments received from interested individuals, commercial fishermen, and from the Director's Herring Advisory Committee (DHAC). The Commission has legislatively-delegated authority to act on these recommendations.

The project goal is to maintain healthy Pacific herring stocks in California.

Project objectives to achieve this goal include:

- Restore healthy age structures to stocks in need of rebuilding;
- Avoid and/or minimize the harvest of two and three-year-old herring, many of which are first-time spawners;
- Manage commercial harvest of Pacific herring to achieve a sustainable fishery;
- Provide sufficient Pacific herring to conserve living resources of the ocean that utilize herring as a food source;
- Provide sufficient Pacific herring to support recreational take.

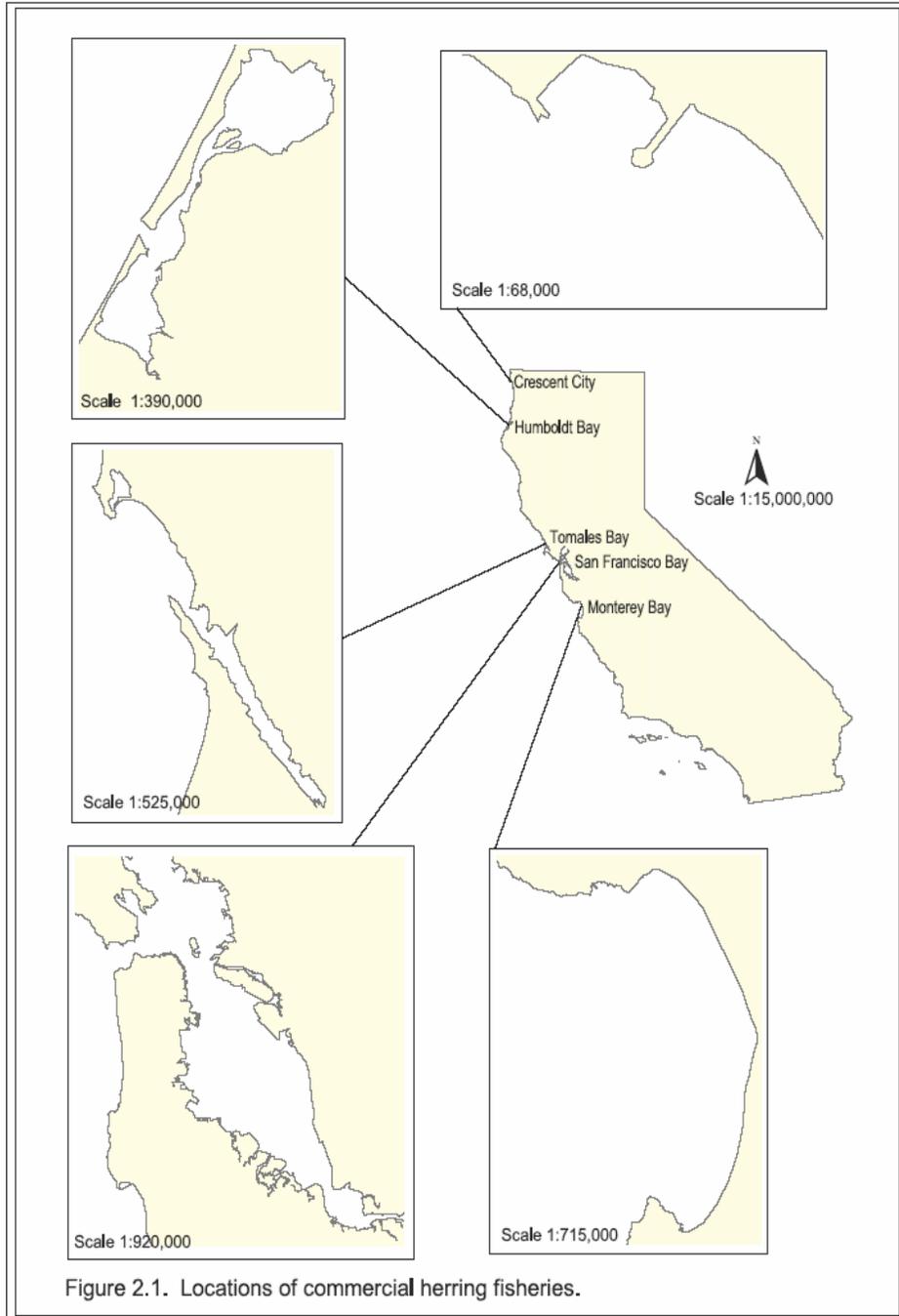
Under existing law, herring may be taken for commercial purposes only under a revocable permit, subject to such regulations as the Commission shall prescribe (Fish and Game Code (FGC) Section 8550). Current regulations specify permit qualifications,

permit validation requirements, permit limitations, permit areas, seasons, fishing quotas, gear restrictions, and landing and monitoring requirements.

The proposed project addressed by this FSED consists of amendments and changes to existing regulations for the 2008-09 commercial herring fishing season. The proposed project adjusts the fishing quota and season dates and times that fishing operations are allowed in San Francisco Bay and season dates and times for fishing operations for in Tomales Bay. Quota recommendations for San Francisco Bay are primarily based on the most recent assessments by the Department of Fish and Game (Department) of the size of the spawning population of herring in San Francisco Bay.

2.2 Project Locations

Permits have been issued for commercial herring fishing in five geographically distinct areas of the ocean and estuarine waters under the jurisdiction of the State of California (Figure 2.1). Many of the regulations considered by this document are specific to an area and type of fishing operation. This section describes each area in which regulatory changes are proposed, including current commercial fisheries for herring, and proposed seasons, quotas, and geographical restrictions for those fisheries. A complete description of commercial herring fishing areas is provided in Section 2.2 of the FED. The environmental setting for each geographical fishing area is detailed in Section 3.3 of the FED.



2.2.1 San Francisco Bay

The proposed commercial herring fishing dates and quotas by location are as follows:

2.2.1.1 Roe Herring Fishery

Season: 5:00 p.m. on Monday, December 1, 2008 until noon on Friday, December 19, 2008; and 5:00 p.m. on Sunday, January 4, 2009, until noon on Friday March 20, 2009.

Note: Herring fishing is not permitted from noon Friday through 5:00 p.m. Sunday (Section 163 (h)(5), Title 14, CCR).

Gill net permittees (DH) December 1-5, December 7-12, and December 14-19, and, if necessary, after other platoons have reached their quotas, until the DH quota is reached or the last day of the season.

Gill net permittees (Odd #) January 11-16, January 25-30, February 8-13, February 22-27, and March 8-13.

Gill net permittees (Even #) January 4-9, January 18-23, February 1-6, February 15-20, March 1-6, and March 15-20.

Quota: The total take of herring in San Francisco Bay for commercial purposes shall not exceed 0-10 percent of the most current biomass estimate for San Francisco Bay. This quota range is based on the determination of the Department's assessment of the stock status and utilizing the best science available. The best available science includes, but is not limited to, recent fishery-independent field surveys, commercial catches, age composition, and environmental data. The Department's recommendation for the 2008-09 season is 1,118 tons, which is 10 percent of the 2007-08 spawning biomass.

Note: The overall quota for the herring roe fishery will be reduced by transfers to the herring eggs-on-kelp fishery, and the fresh fish market quota (See Section 2.2.1.2 and 2.2.1.3).

Area: Waters of Districts 12 and 13 and that portion of District 11 lying south of a line extending from Peninsula Point (the most southerly extremity of Belvedere Island) to the easternmost point of the Sausalito ferry dock.

1) Regulations prohibit the setting or operating of nets within 300 feet of the following piers and recreation areas: Berkeley Pier, Paradise Pier, and San Francisco Municipal Pier (between the foot of Hyde Street and Van Ness Avenue), Pier 7 (San Francisco), Candlestick Point State Recreation Area, the jetties in Horseshoe Bay, and the fishing pier at Fort Baker. Regulations also prohibit the setting or operating of nets within 70 feet of Mission Rock Pier.

2) Regulations prohibit the setting or operating of nets in Belvedere Cove (north of a line drawn from the tip of Peninsula Point to the tip of Elephant Rock). Regulations also prohibit the setting or operating of gill nets from November 15 through March 17 in the area bounded by a line drawn from the middle anchorage of the western section of the Oakland Bay Bridge (Tower C) to the Lash Terminal buoy #5 to the easternmost point at Hunter's Point (Point Avisadero), from Point Avisadero to the Y "A" buoy to Alameda NAS entrance buoy #1 (entrance to Alameda Carrier Channel) to the Oakland Harbor Bar Channel buoy #1, and then from the first Bar Channel buoy to Tower C of the Bay Bridge.

3) Other closures affecting the fishery include United States Coast Guard enforced Homeland Security Zones: 25 yards around all Golden Gate and Bay Bridge abutments and piers; 100 yards around and under any High Interest Vessels; and Naval Vessel Protection Zones which extend 100 yards around all Naval Vessels at all times and a 500 yard slow zone surrounding all Naval Vessels. The United States Coast Guard will also enforce Rule 9 of the Code of Federal Regulations (CFR) regarding channel and harbor blockages.

2.2.1.2 Herring Eggs-on-Kelp (HEOK) Fishery

Season: December 1, 2008 to March 31, 2009

Quota: A 1,118-ton quota for San Francisco Bay would result in a 1.9-ton individual quota for transferred "CH" gill net permits and a 1.1-ton quota for individual gill net permits.

Note: The combined quota for harvest of herring eggs on kelp depends on the number of "CH" and gill net permits transferred to the herring eggs on kelp fishery.

Area: Waters of Districts 11, 12, and 13, and that portion of District 2 known as Richardson Bay.

Note: The area open to the herring eggs-on-kelp fishery is further restricted. Rafts and lines may not be placed in any waters or areas otherwise closed or restricted to the use of herring gill net operations, except the areas known as Belvedere Cove and Richardson Bay or except where written permission is granted by the owners or controlling agency (e.g., Navy, Coast Guard). When rafts or lines are placed in Belvedere Cove or Richardson Bay, they must be tied to a permanent structure (e.g., pier or dock).

2.2.1.3 Fresh Fish Market Fishery (not for roe purposes) San Francisco Bay

Season: November 2 through November 15, 2008 and April 1 through October 31, 2009.

Quota: 20 tons, except that 10 tons total may be transferred to gill net permittees participating in research sponsored by the Department.

Note: No permittee may take or possess herring except in the amount specified on a current daily market order, not to exceed 500 pounds, from a licensed fish dealer.

Area: Same as the roe herring fishery.

2.2.2 Tomales Bay

The proposed Department commercial herring fishing dates by location are as follows:

2.2.2.1 Roe Herring Fishery

Season: Noon on Friday, December 26, 2008, until noon Friday, February 27, 2009. Weekend fishing is allowed contingent on funds made available to the Department to cover biological staff time.

Quota: The total take of herring for roe purposes shall not exceed 350 tons for the season.

Area: Tomales Bay includes the waters of District 10 lying south of a line drawn west 252° magnetic, from the western tip of Tom's Point to the opposite shore.

2.2.2.2 Fresh Fish Market Fishery (not for roe purposes) Tomales Bay

Season: November 2 through November 15, 2008 and April 1 through October 31, 2009.

Quota: 10 tons

Note: No permittee may take or possess herring except in the amount specified on a current daily market order, not to exceed 500 pounds, from a licensed fish dealer.

Area: Same as roe fishery.

2.3 Project Characteristics

The proposed project recommends continuation of the existing regulations as modified by changes discussed below for San Francisco and Tomales bays. No modifications are proposed for Crescent City Harbor area, Humboldt Bay, and open ocean herring fisheries. These regulations, as amended, will assist in the control of the commercial harvest of herring at a level that meets the State's policy with respect to the use of aquatic resources. This section states the specific purpose of the regulations and summarizes the factual basis for the regulation.

The commercial roe herring and eggs-on-kelp fisheries are closely regulated through a catch-quota system to provide for adequate protection and utilization of the herring resource. The Department conducts annual assessments of the size of the spawning population of herring in San Francisco Bay (Section 3.2.2.1, FED). These data serve as the basis for establishing fishing quotas for the following season. The principal regulatory changes proposed for the 2008-09 season included: (1) providing the Commission the option to consider a quota equal to 0-10 percent of the most recent spawning biomass estimate. The Department's recommendation for the 2008-09 season is 1,118 tons, which is 10 percent of the 2007-08 spawning biomass; (2) set the dates of the roe herring fisheries in San Francisco Bay from 5:00 p.m. on December 1, 2008, until noon on December 19, 2008 ("DH" gill net platoon only), and 5:00 p.m. on January 4, 2009, until noon on March 20, 2009; (3) set the dates of the roe herring fishery in Tomales Bay from noon on December 26, 2008, until noon on February 27,

2009. No quota changes were made for the Crescent City Harbor area, Humboldt Bay, and Tomales Bay fisheries.

Annual herring spawning population estimates from biomass surveys in San Francisco and Tomales bays have been conducted by the Department since 1973 but were discontinued in Tomales Bay in 2006-07. Spawning ground surveys in Humboldt Bay were conducted during the 1974-75, 1975-76, and 1990-91, and discontinued following the 1991-92 season; surveys were resumed beginning with the 2000-01 season, and discontinued following the 2006-07 season. Spawning ground surveys have been used to estimate spawning biomass in San Francisco, Tomales, and Humboldt bays. Spawning ground surveys assess the total number of eggs spawned and these data are used to calculate the parental population size (Section 3.2.2.1.1 of the FED).

From 1990 through 2003, the Department derived the spawning biomass estimate in San Francisco Bay by meshing the results of the spawn deposition and hydroacoustic surveys. Beginning with the 2003-04 season, the Department conducted spawning deposition surveys as the primary assessment tool to estimate the spawning biomass. Trawl surveys were used to support the location and timing of the spawn deposition survey. Spawning biomass estimates for San Francisco Bay are shown in Figure 2.2. Currently, the Department does not conduct spawning biomass surveys in Tomales Bay, Humboldt Bay or the Crescent City Harbor area.

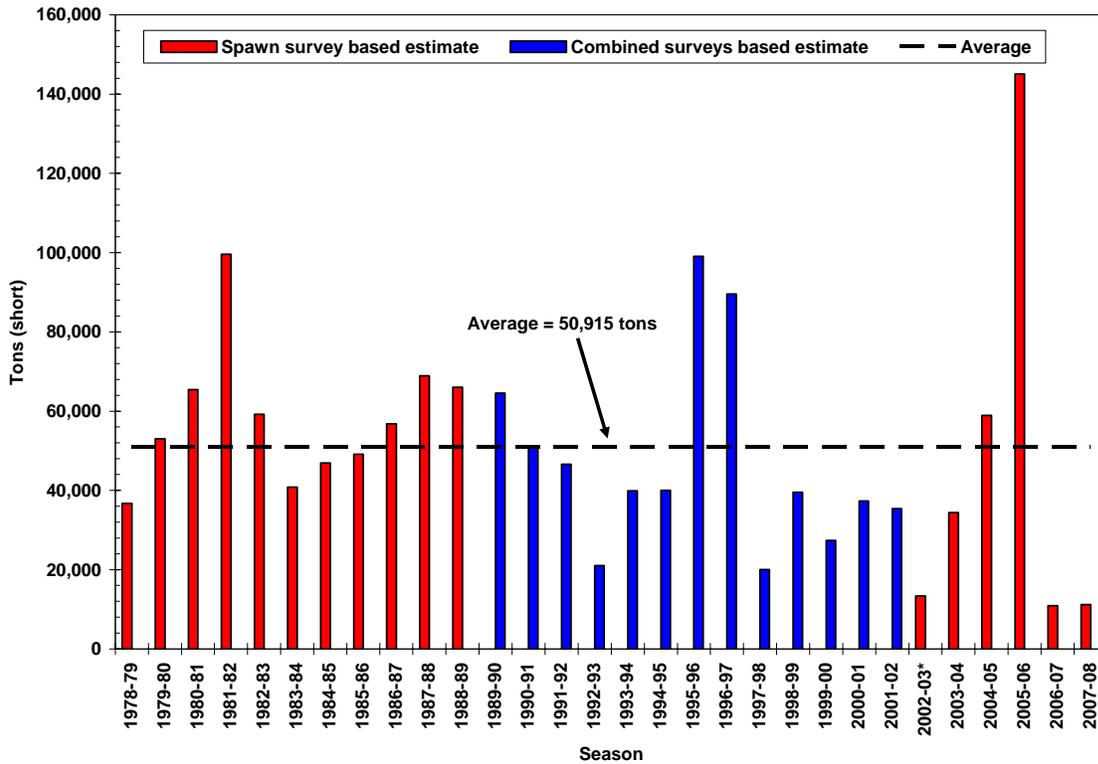


Figure 2.2 San Francisco Bay Pacific herring spawning biomass estimates for seasons 1978-79 to 2007-08

Annual roe herring fishery quotas are conservative and historically were set to insure that the total catch did not exceed 20 percent of the previous season’s spawning biomass estimate, taking into account possible accidental overages and other management uncertainties. The previous season’s biomass is considered the best available estimate to quantify herring returning the following season. This exploitation level was selected, based upon computer model simulations developed by the Pacific Fisheries Management Council (Section 3.2.4 of the FED), to help ensure adequate protection of the herring resource while providing long-term sustainability of the fishery. Typically, exploitation rates of no more than 15 percent have been recommended to prevent accidental overages from exceeding the 20 percent maximum harvest rate. Quotas are not determined by a fixed percentage; they are modified based on additional biological and fishery data collected each season, such as growth rates, strength and

importance of individual year-classes, recruitment of incoming year-classes, and oceanographic conditions.

In addition to annual changes in quotas, management recommendations to improve or provide for the efficient harvest and orderly conduct of the herring fisheries are solicited from interested fishermen, individuals at public meetings, and DHAC. The proposed amendments to Sections 163 and 164, Title 14, CCR, addressed by this FSED, reflect both Department and the public recommendations brought forward by the Department.

2.3.1 Roe Herring Fisheries

2.3.1.1 San Francisco Bay 2007-08 Quota

The San Francisco Bay spawning biomass estimate for the 2007-08 season was a near record low at 11,183 tons, and only a slight improvement over the record low biomass estimate, in 2006-07, of 10,935 tons. It is the second lowest recorded estimate in the history of the roe herring fishery (1978-79 season to present). The precipitous drop in spawning biomass, from a record high in 2005-06, to a record low in 2006-07, and its persistence at a low level may have been caused by unfavorable ocean conditions, and consecutive dry winters for San Francisco Bay.

Since the 2002-03 season, the Department has expressed concern regarding the health, specifically the age structure, of the San Francisco Bay herring population. One of the Department's herring fishery management goals is to target the harvest of age four and older herring and to minimize the harvest of two- and three-year old fish, many of which are first-time spawners. Mesh size regulation can be an effective way to achieve this goal by directly affecting the size selectivity of gill net which indirectly effects the ages caught in the net. Beginning with the 2005-06 season, the Commission reduced the minimum gill net mesh restriction to two inches to allow for greater efficiency in capturing herring which have exhibited a coast-wide trend in decreasing mean length at age, and a truncation in age-classes. The use of two inch mesh gill nets in the San Francisco Bay fishery, however, has the potential to increase the take of two- and three-year old fish in the commercial catch. Size selectivity and efficiency of gill

nets is dependent upon mesh size, and three-year old herring would be more vulnerable to the two inch mesh than the larger mesh sizes that were previously allowed, especially when growing conditions for herring are optimal.

The 2007-08 season commercial samples were aged to estimate the impact of commercial gear on the San Francisco Bay herring spawning stock. Based on age estimates for the commercial catch this season (Figure 2.3), the take of three-year old herring decreased from the prior season, and were well below the commercial historical take of three-year olds. The take of three-year old herring may have decreased in the commercial catch due to the survival and improved condition of older herring, which are larger and more susceptible to the selectivity of two inch mesh gill nets. Continued monitoring of the commercial catch will ensure that the Department management goals are maintained.

The Department is providing the Commission the option to consider a quota within the range of 0-10 percent of the 2007-08 spawning biomass estimate of 11,183 tons. The Department recommends a quota for the 2008-09 season of 1,118 tons, which is 10 percent of the 2007-08 spawning biomass. While the Department is concerned with the status of the herring population in San Francisco Bay, this recommendation likely represents a sustainable level of catch under current conditions. This is the second consecutive year with a near record low spawning biomass for San Francisco Bay and there may be future negative effects to the herring population from the November 7, 2007 *Cosco Busan* oil spill (see Section 3.3.2). Results from the Natural Resources Damage Assessment (NRDA) study on oil impacts to herring resources have not yet been released. If results from this study show significant negative impacts to herring eggs and larvae in areas exposed to oil, the Department and state and federal NRDA scientists will need to determine the effect this may have on the overall strength of the 2007-08 herring year-class.

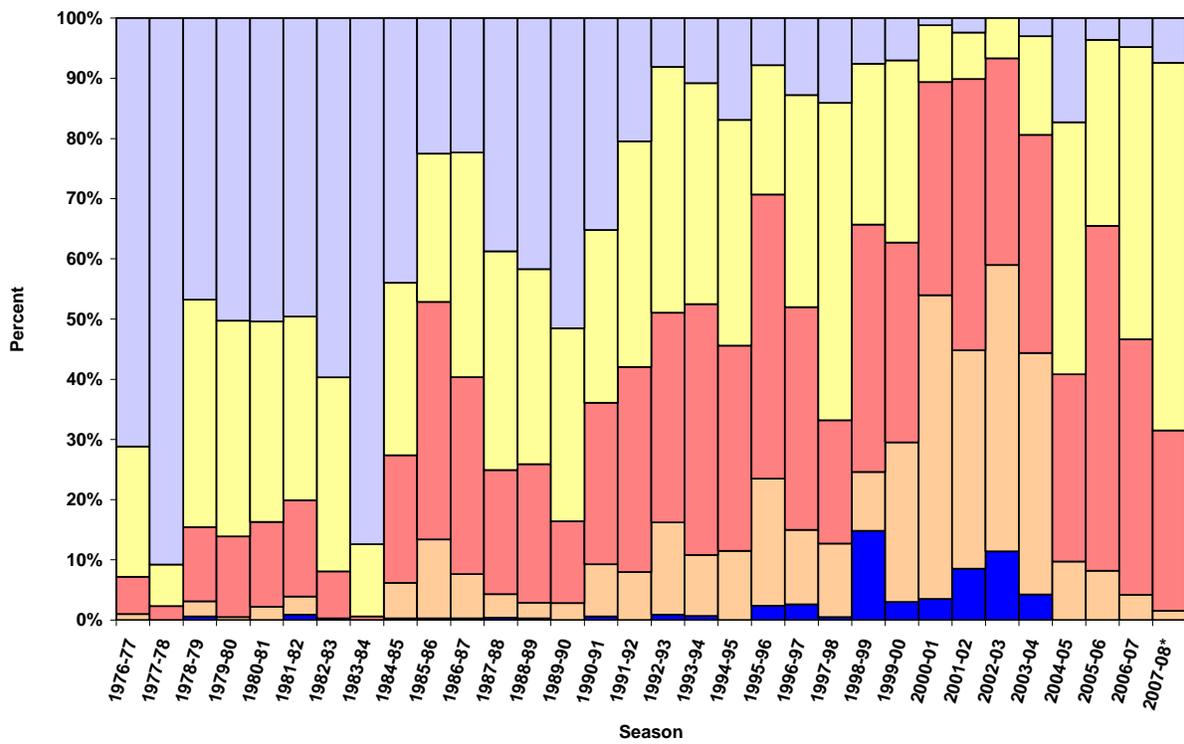


Figure 2.3 Age composition of the commercial gill net catch for the San Francisco Bay herring fishery



Note: The percentages for 6-year olds are fish age 6 and above combined.

Within the overall quota for San Francisco Bay, separate quotas are established for each gill net platoon (i.e., December “DH”, Odd, and Even fishing groups). The overall quota is divided among the three platoons in proportion to the number of permits assigned to each platoon. Slight annual adjustments in the quota assignments for each fishing group are needed to account for attrition of permittees and the use of herring permits in the herring eggs on kelp (HEOK) fishery. HEOK fishing occurs only in San Francisco Bay and the fishery is regulated under Section 164, Title 14, CCR. Individual HEOK quotas depend on the total herring fishery quota for San Francisco Bay established by the Fish and Game Commission under Section 163, Title 14, CCR. In 1994, the Commission provided HEOK permittees possessing “CH” permits with a HEOK quota equal to approximately 0.79 percent of the overall quota. All HEOK

permittees must hold a herring permit. To fish HEOK, permittees must waive herring fishing privileges under Section 163 and “exchange” their “share” of the herring quota for an equivalent HEOK quota. The current factor used to convert an equivalent amount of whole fish to the herring eggs on kelp fishery is 0.2237. This factor was derived from the round haul to gillnet conversion ratio allotted during the 1988-89 season.

2.3.1.2 Tomales Bay, Humboldt Bay, and Crescent City Harbor 2008-09 Quota

The previously set quota for Tomales Bay, Humboldt Bay and Crescent City Harbor area is 350 tons, 60 tons, and 30 tons, respectively.

2.3.1.3 Season Dates

Season opening and closing dates for San Francisco and Tomales bays, as well as the dates of various provisions of the regulations, are adjusted each year to account for annual changes in the calendar. The consensus of the DHAC, which met on April 17, 2008, was to recommend that the dates and times of the roe herring fisheries in San Francisco Bay be set from 5:00 p.m. on Monday, December 1, 2008, until noon on Friday, December 19, 2008 ("DH" gill net platoon only). Recommended dates for the odd and even platoons are from 5:00 p.m. on Sunday, January 4, 2009, until noon on Friday, March 20, 2009. The consensus among Tomales Bay permittees was to recommend opening at noon on Friday, December 26, 2008, until noon Friday, February 27, 2009. The Department concurs with the season dates for San Francisco and Tomales bays.

2.4 Project Alternatives

Three alternatives to the proposed project are considered. These alternatives were examined and detailed in the FED, 1998, and re-examined as they apply to this FSED. Two of these alternatives take the form of additional changes to the existing regulations that could feasibly be joined. The third alternative is a no project (no fishery) alternative. In evaluating alternatives, the comparative merits and impacts of individual

alternatives that could be logically and feasibly joined should be considered as so joined unless otherwise stated. The alternatives to be considered under this FSED are:

- Alternative 1 (no project, i.e. no fishery, alternative). Under this alternative, the commercial harvest of herring would be prohibited.
- Alternative 2 (existing regulations). Under this alternative, existing regulations would be modified only by adjusting quotas to reflect current biomass estimates and by adjusting dates to reflect changes in the calendar.
- Alternative 3 (individual vessel quota for gill net vessels in herring roe fishery). Under this alternative the proposed regulations would be modified by establishing an individual vessel quota for all gill net vessels. The proposed individual gill net vessel quota would equal the overall gill net quota divided by the number of permittees using gill net gear.

The following section states the specific purpose of the alternatives and summarizes the factual basis for determining that the alternatives are reasonably necessary.

2.4.1 Alternative 1 (no project)

This is a CEQA required alternative. It provides a reference for comparison to the proposed project and alternatives 2 and 3.

2.4.2 Alternative 2 (existing regulations)

The existing regulations for the commercial herring fishery are for the 2007-08 season. Under Alternative 2, no changes would be made to revise the herring fishing seasons by location, and adjust quotas to reflect the 2007-08 biomass estimate determined by the Department. None of the other amendments to the regulations contained in the proposed project would be considered.

2.4.3 Alternative 3 (individual vessel quota)

This alternative would establish an individual herring quota for each San Francisco Bay gill net permittee. Under existing regulations [Section 163(g)(4)(C), Title

14, CCR] an overall herring quota is established for each of the three gill net groups (platoons) in San Francisco Bay, allowing individual permittees to take and land as much fish (tonnage) as they are capable of until the overall quota for their respective group is reached. An individual permit quota has been suggested each season for the past several years. However, there has never been a clear consensus of support or opposition among industry members about this issue. The Department is concerned about the level of enforcement effort that would be necessary to effectively monitor and enforce this alternative. See Section 2.4.3 of the FED for a full description of this alternative.

Chapter 3. ENVIRONMENTAL SETTING

3.1 General

Pacific herring, *Clupea pallasii*, are found throughout the coastal zone from northern Baja California on the North American coast, around the rim of the North Pacific Basin and Korea on the Asian coast (Hart 1973, Outram and Humphreys 1974). In California, herring are found offshore during the spring and summer months foraging in the open ocean. Beginning as early as October and continuing as late as April, schools of adult herring migrate inshore to bays and estuaries to spawn. Schools first appear in the deep water channels of bays to ripen (gonadal maturation) for up to two weeks, then gradually move into shallow areas to spawn. The largest spawning aggregations in California occur in San Francisco and Tomales bays. San Francisco Bay is also near the southern end of the range for Pacific herring (Miller and Schmidtke 1956).

Spawning occurs in the intertidal and shallow subtidal zones. Males release milt into the water column while females extrude adhesive eggs on a variety of surfaces including vegetation, rocks, and man-made structures such as pier pilings, boat bottoms, rock rip-rap, and breakwater structures. Embryos (fertilized eggs) typically hatch in about 10 days, determined mainly by water temperature. Larval herring metamorphose into juvenile herring in about 10 to 12 weeks. In San Francisco Bay, juvenile herring typically stay in the bay through summer, then migrate out to sea. Research conducted on herring in Straits of Georgia, British Columbia (BC) suggests that one- and two-year old herring occupy inshore waters and older herring occupy shelf waters (Haegele 1997). In BC waters, juvenile herring during the summer were found in shallow nearshore waters of less than 50 meters, in shoals of similar-sized individuals. Based on the life history data of Pacific herring in BC waters there may be very little direct competition for food between age classes, and the first opportunity for direct interaction may be when herring sexually mature and join the spawning stock (Hay 2002).

Most of the herring fisheries occur during the spawning season. The roe herring gill net fisheries catch herring as they move into the shallows to spawn when the eggs are ripest. The primary product from this fishery, *kazunoko*, is the sac roe (eggs) in the females which are processed and exported for sale to Japan. California's roe herring fisheries occur in the Crescent City Harbor area, Humboldt Bay, Tomales Bay, and San Francisco Bay.

The San Francisco Bay herring eggs-on-kelp fishery suspends giant kelp, *Macrocystis pyrifera*, from rafts for herring to spawn on in shallow water areas. The kelp is harvested near the Channel Islands and/or in Monterey Bay and then transported to San Francisco Bay. The product of this fishery is the egg-coated kelp blades that are processed and exported to Japan. This product, *komochi* or *kazunoko kombu*, is typically served as an appetizer during New Year's celebrations.

The only open ocean fishery for herring in California occurs during the non-spawning season in Monterey Bay. Landings from this fishery enter the aquarium food and bait markets. Small fisheries for fresh fish are also permitted during the non-spawning season in Tomales Bay and San Francisco Bay. Herring are a food source for many species of birds, fish, invertebrates, and mammals. Predation is particularly high during spawning when adult fish and eggs are concentrated and available in shallow areas. Predation by birds and fish during the egg stage, when eggs are deposited in the intertidal and shallow subtidal zones, is a significant cause of natural mortality for herring.

The roe herring fishery in California has been intensively regulated since its inception in 1973, at first by the California State Legislature, then by the Fish and Game Commission (Commission). Department of Fish and Game (Department) estimates of the spawning population biomass have provided a critical source of information used for establishing fishery quotas to control the harvest of herring and provide for the long-term health of the herring resource. A thorough description of the environmental setting is provided in Chapter 3 of the 1998 Final Environmental Document (FED), which includes Pacific herring life history, ecology, status of stocks and fisheries at that time,

and biological and environmental descriptions of herring fishery locations (Crescent City Harbor area, Humboldt Bay, Tomales Bay, San Francisco Bay, and Monterey Bay).

3.2 Spawning Population Estimation Methods

During the 1973-1974 through 1988-89 seasons Department estimates of San Francisco Bay herring spawning biomass were made using spawn deposition surveys (refer to Sections 3.4 and 3.5 below). From the 1990-91 through 2001-02 seasons, the Department estimated San Francisco Bay spawning biomass using a combination of spawn deposition and hydroacoustic surveys. In 2002-03, the Department was unable to generate a spawning biomass due to a wide discrepancy between the two survey methods.

The Department assessed the two methods using the Coleraine Model, as well as having an independent peer review conducted by California Sea Grant. The results indicated that the spawn deposition survey provided a better estimate of spawning biomass. Beginning with the 2003-04 season, the Department reverted to using the spawn deposition surveys alone for biomass estimation. In addition to the estimates of spawning biomass, the Department collects fishery independent age composition data from the population, as well as fishery dependent age composition data from the commercial catch. All of the information collected by the Department, including ocean conditions, is used in annual population assessments.

3.3 Status of the San Francisco Bay Spawning Population

The 2007-08 season spawning biomass estimate for San Francisco Bay was 11,183 tons, well below the previous 29-season average of 52,285 tons, but a two percent increase over last season's estimate of 10,935 tons. A second consecutive season with a poor returning spawning biomass suggests that unfavorable oceanic conditions may have had a negative impact on the population. Normally, seasons with dramatic declines in spawning biomass do not recapture the former high levels within the following season, but can exhibit remarkable improvement (Figure 2.2).

San Francisco Bay environmental conditions have changed over the past two seasons which may hinder spawning success. Subtidal vegetation within the major spawning areas of San Francisco Bay declined greatly over the past two seasons. The decline in subtidal vegetation reduced the available natural subtidal spawning substrate for herring in the bay, which resulted in greater utilization of intertidal areas and pier pilings as spawning substrates. These areas are subject to greater bird predation, egg loss due to wave action, egg mortality due to preservation treatments on piers, and desiccation of eggs.

Other changes in environmental conditions of the bay are related to decreased freshwater inflow into San Francisco Bay. Low bay salinity is necessary for spawning success. Rainfall increases the freshwater inflow which normally lowers bay salinities; however, dry winters have occurred in two consecutive seasons.

There were 13 recorded spawning events during the 2007-08 season, spread throughout the Central and Northern areas of San Francisco Bay. Spawning events were recorded from as far north as Pt. San Quentin and south to Oyster Point. The first recorded spawn of the season occurred on December 3, 2007, and the last recorded spawn occurred on March 9, 2008 (Table 3.1). There were several small intermittent spawning events through most of December, occurring in Richardson Bay and southern portions of San Francisco Bay. The first large event did not occur until January 15, along the San Francisco waterfront. A second large event occurred four weeks later (February 17-19, 2008) extending from Point San Quentin to Bluff Point. Combined, these two events made up 93 percent of the total spawning escapement for the 2007-08 season.

Spawn events during the 2007-08 season were unlike previous seasons in that a majority of the spawn estimate came from only two large events. During previous seasons, spawn events frequently occur on a bi-weekly basis and are similar in size. It is unusual for two single events to make up such a large portion of the returning biomass.

Research catch samples were collected to estimate the number of herring at age in the San Francisco Bay spawning population. While the herring population has

experienced a truncation of age classes, the current age composition reflects significant declines in the estimated numbers of age four and older herring in the spawning biomass. The estimated number of age three herring this season was an historic low, and the estimated number of age classes two through five remained well below average (Table 3.2). The percentage of age four and older herring in the spawning population, which have historically comprised the majority of the catch, decreased, and the available biomass at those age classes declined (Figure 3.1). Despite these factors, the commercial catch increased this season as herring appeared to return to San Francisco Bay in a better condition than last season.

#	Approximate Spawn Date	Location	Subtidal	Intertidal	Gill-Net*	HEOK*	Total
1	December 3 2007	Richardson Bay	15.7				15.7
2	December 17 2007	Candlestick		49.9			49.9
3	December 27 2007	Richardson Bay	91.0				91.0
4	December 31 2007	Oyster Point	0.5				0.5
5	January 3 2008	Mission Rock/Ramp		Trace	21.9		21.9
6	January 11 2008	Richardson Bay	455.5		0.2		455.7
7	January 16 2008	Point Diablo		15.9			15.9
8	January 15-16-17 2008	SF Waterfront		4863.3	438.9		5302.2
9	January 17 2008	Richardson Bay	0.6			33.1	33.7
10	February 4 2008	Richardson Bay	5.0				5.0
11	February 17-18 2008	Pt. San Quentin/Paradise Richardson Bay/ Sausalito	607.3	4260.0	226.2		5093.4
12	February 18-19 2008	WF				34.2	34.2
13	March 9 2008	Richardson Bay	64.4				64.4
Totals in Tons			1239.9	9189.0	687.2	67.3	11,183.4

* Commercial landings from herring roe (gill-net) and herring-eggs-on-kelp fisheries.

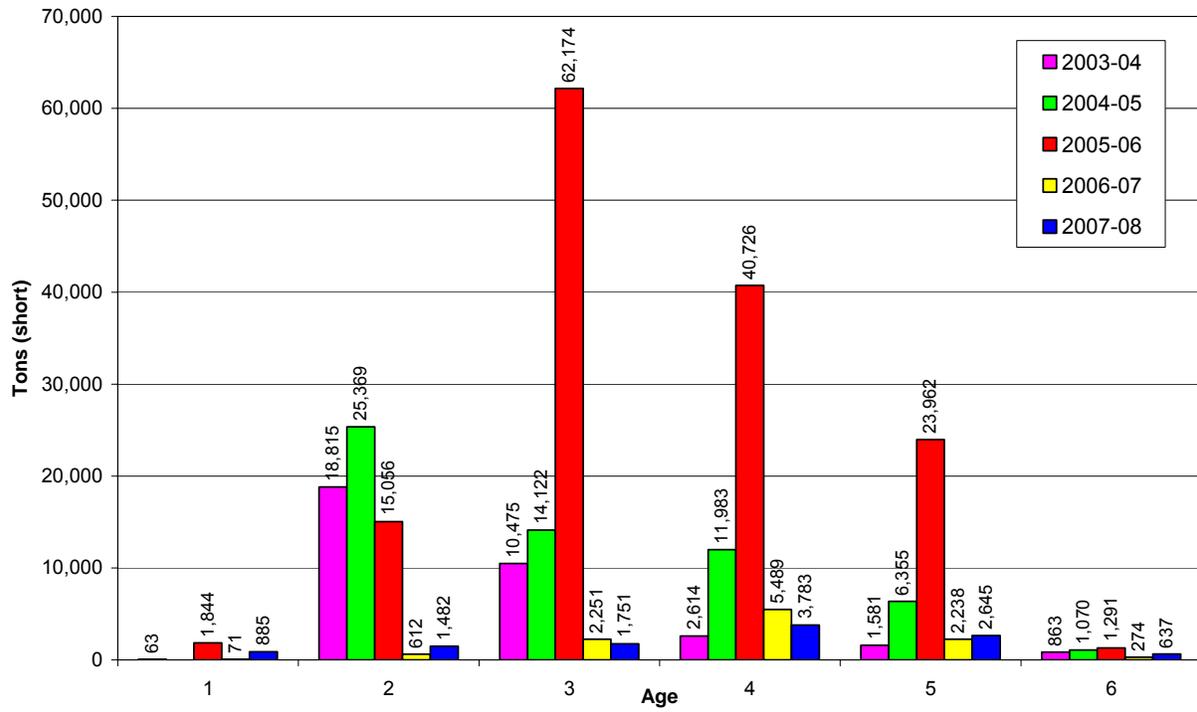


Figure 3.1 San Francisco spawning biomass by age class for the 2003-04 to 2007-08 seasons

Length-weight regression analysis of data taken from ripe herring sampled this season with Department research nets indicates that herring above 150 millimeters (mm) were heavier in weight for a given body length (BL) compared to the 2006-07 season (Figure 3.2). Additionally, samples taken from the commercial gill net fishery this season showed that mean length remained the same, but the weights of San Francisco Bay herring were higher than the fish caught during the 2006-07 season. The mean length of herring in commercial gill net samples last season (2006-07) was 186 mm BL and weighed an average of 91 grams (g). This season (2007-08), the average length of herring in the commercial catch remained the same at 186 mm BL, but the average weight showed a substantial increase to 97 g. The length-weight relationship of herring can also be used to develop condition factor indices which are used to describe the health or condition of a population. San Francisco Bay herring condition factor indices showed that ripe herring returned this season in better condition than last season (Figure 3.3). Better condition, especially in females, may indicate greater fecundity, and larger eggs that may enhance survival.

The 2007-08 index indicates better herring growth than the 2006-07 index, but it still remains below the historical average. Since the 2002-03 season, the Department has expressed concern regarding the health, specifically the age structure, of the San Francisco Bay herring population. Additionally, since the 1997-98 El Niño, the estimated number of age four and older herring which had historically supported the gill net fishery has declined in the population and the proportion of age three herring has increased in the catch.

Age data for the past season continue to show that age four and older herring have declined in the spawning population while the percent of age three and younger have increased. One of the Department's herring fishery management goals is to allow the harvest of age four and older herring and to avoid the harvest of two- and three-year old fish, many of which are first-time spawners. Commercial age data showed a 2.7 percent decrease in age three herring taken by the gill net fishery compared to last season. The Department remains concerned about a coast-wide trend in decreasing

mean length at age, and a truncation in age-classes reported for herring fisheries along the eastern Pacific coast since the 1997-98 El Niño.

In summary, the near record low spawning biomass in successive seasons is the likely result of unfavorable oceanic conditions. These conditions led to a large decline in the numbers of herring returning to San Francisco Bay to spawn. San Francisco Bay environmental conditions (i.e. subtidal vegetation and freshwater inflow) may be less than optimal and hinder the stock rebuilding process. The improved growth rate of spawning herring resulted in increased weight and girth, which leads to increased fecundity and higher commercial roe herring catches. The age structure of the population remains a concern due to the truncation of age classes combined with low estimated numbers across all age classes. If this combination persists, it may lead to an unhealthy herring population, an unsustainable fishery, and delayed stock rebuilding. There is potential for improvement next season, if the two- and three-year old age classes recruit fully to the spawning population in high enough numbers, and older age classes do not incur excessive natural mortality in the open ocean. The prolonged La Niña event through 2007 and 2008 (National Oceanic & Atmospheric Administration, 2008) is thought to be beneficial for cool water species like Pacific herring. El Niño Southern Oscillation (ENSO) indicators predict a weakening of La Niña, to neutral conditions which could prevail by June or July. Ameliorating some of the concerns with the herring population was the timely start of spring upwelling this season which occurred as the spawning population left San Francisco Bay and returned to the open ocean. The timeliness of upwelling and its continuance into summer could provide favorable conditions for herring that may lead to better growth and survival.

Table 3.2 Estimated numbers (x 1,000) of herring-at-age in the San Francisco Bay spawning population, 1982-83 to present

Age and Percent Composition																			
Season	1	%	2	%	3	%	4	%	5	%	6	%	7	%	8	%	9	%	Total
82-83	a	N/A	87,908	14.8	149,971	0.3	182,936	30.7	118,040	19.8	30,478	5.1	17,177	3	8,121	1	797	0.1	595,428
83-84	a	N/A	332,699	56.6	69,654	0.1	92,565	15.8	73,840	12.6	17,306	2.9	1,168	0	117	0	0	0	587,349
84-85	a	N/A	184,695	38.7	190,998	40	46,613	9.8	22,153	4.6	25,914	5.4	6,652	1	688	0	0	0	383,033
85-86	a	N/A	162,422	32.4	160,613	32.1	126,535	25.3	26,790	5.3	16,038	3.2	7,752	2	717	0	182	0	501,049
86-87	a	N/A	168,962	29.2	194,365	33.6	134,528	23.2	64,598	11.2	9,182	1.6	6,175	1	1,065	0	246	0	579,121
87-88	a	N/A	233,193	30.6	292,508	38.3	136,604	17.9	66,494	8.7	25,337	3.3	5,027	1	3,939	1	0	0	763,102
88-89	a	N/A	146,525	25.8	222,058	39	139,906	24.6	44,435	7.8	12,310	2.2	3,030	1	534	0	0	0	568,798
89-90	a	N/A	294,631	37.6	237,377	30.3	136,248	17.4	84,361	10.8	23,970	3.1	6,572	1	0	0	0	0	783,159
90-91																			
91-92	1,356	0.3	13,666	3.0	126,016	28	206,930	45.2	82,870	18.1	23,764	5.2	3,490	1	0	0	0	0	458,092
92-93	0	0	48,925	20.5	50,398	21.1	79,045	33.1	51,713	21.7	8,642	3.6	0	0	0	0	0	0	238,723
93-94	11,485	2.6	22,403	5.1	134,870	31	160,335	36.9	63,331	14.6	25,926	6	4,808	1	355	0	0	0	423,513
94-95	2,276	0.5	39,363	9.0	236,783	54.1	94,833	21.7	42,850	9.8	18,223	4.2	3,196	1	0	0	0	0	437,524
95-96	3,142	0.3	483,164	38.9	359,357	29	282,069	22.7	81,768	6.6	28,904	2.3	1,687	0	0	0	0	0	1,240,091
96-97	1,184	0.1	290,497	29.1	359,459	36	183,370	18.4	120,029	12	33,098	3.3	8,935	1	270	0	0	0	996,842
97-98	42	0	45,092	17.2	129,411	49.3	65,637	25	18,724	7.1	2,259	0.9	1,430	1	0	0	0	0	262,595
98-99	1,931	0.4	256,816	52.0	54,306	11	114,835	23.2	56,915	11.5	9,729	2	558	0	978	0	^b	0	496,068
99-00	1,440	0.4	103,490	30.4	154,260	45.3	48,150	14.1	29,000	8.5	4,310	1.3	0	0	0	0	^b	0	340,650
00-01	255,158	36	178,401	35.4	185,748	36.9	65,555	13	24,267	4.8	126	0	0	0	0	0	0	0	709,255
01-02	5,788	1.5	157,182	39.6	138,752	35	75,088	18.9	15,383	3.9	4,265	1.1	152	0	0	0	0	0	396,610
02-03																			
03-04 ^c	2,473	0.5	328,257	65.5	122,072	24.3	26,641	5.3	14,848	3	7,225	1.4	0	0	0	0	0	0	501,516
04-05 ^d	0	0	287,298	33.1	360,741	41.6	166,538	19.2	44,684	5.2	8,367	1	0	0	0	0	0	0	867,628
05-06	59,112	3.2	217,177	11.7	896,819	48.3	438,877	23.6	234,285	12.6	11,202	0.6	0	0	0	0	0	0	1,857,473
06-07	2,176	1.5	11,970	8.1	37,000	25.0	70,734	47.8	23,941	16.2	2,176	1.5	0	0	0	0	0	0	147,997
07-08	24,928	16.1	31,035	20.0	25,714	16.6	42,578	27.5	24,987	16.1	5,602	3.6	0	0	0	0	0	0	154,844
Mean	23,281	4.0	171,907	28.5	203,719	31.1	129,881	23.3	59,596	10.5	14,765	2.7	3,242	0.6	699	0.1	56	0.0	595,436

Note: The 1990-91 and 2002-03 seasons were not estimated due to incomplete or unresolved data sets.

^a 1-year-olds were not estimated, ^b 9-year-olds were not estimated, ^c includes corrected estimated number of two-year-olds, ^d no 1-year-olds were sampled in spawning condition

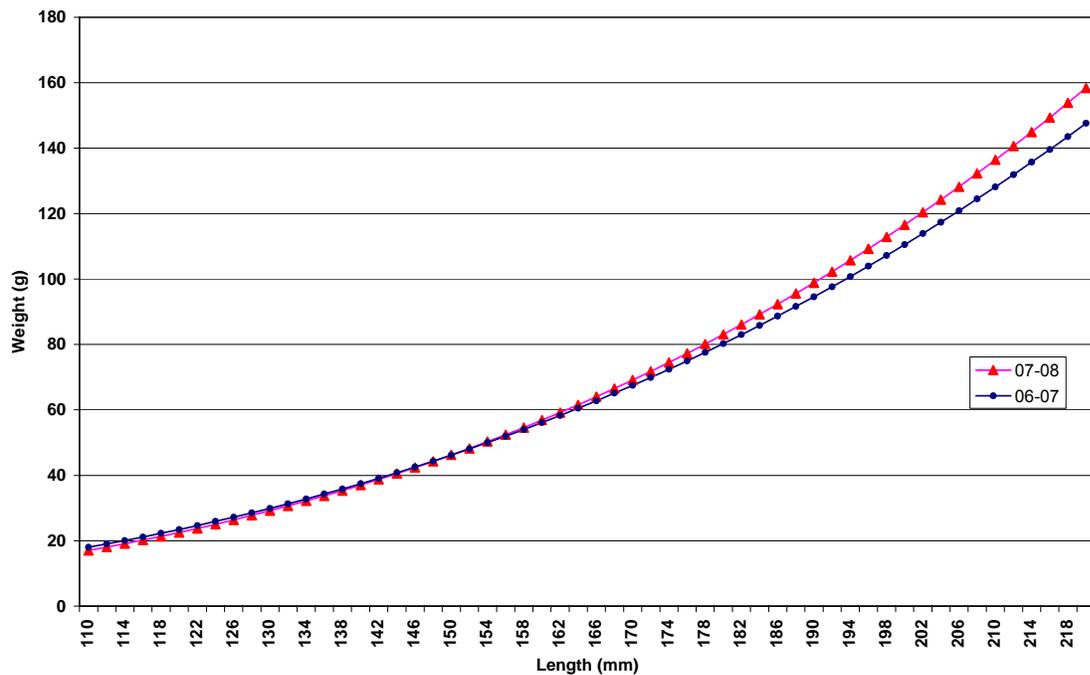


Figure 3.2 Length-weight relationships of ripe San Francisco Bay herring captured with research gear during the 2006-07 and 2007-08 seasons

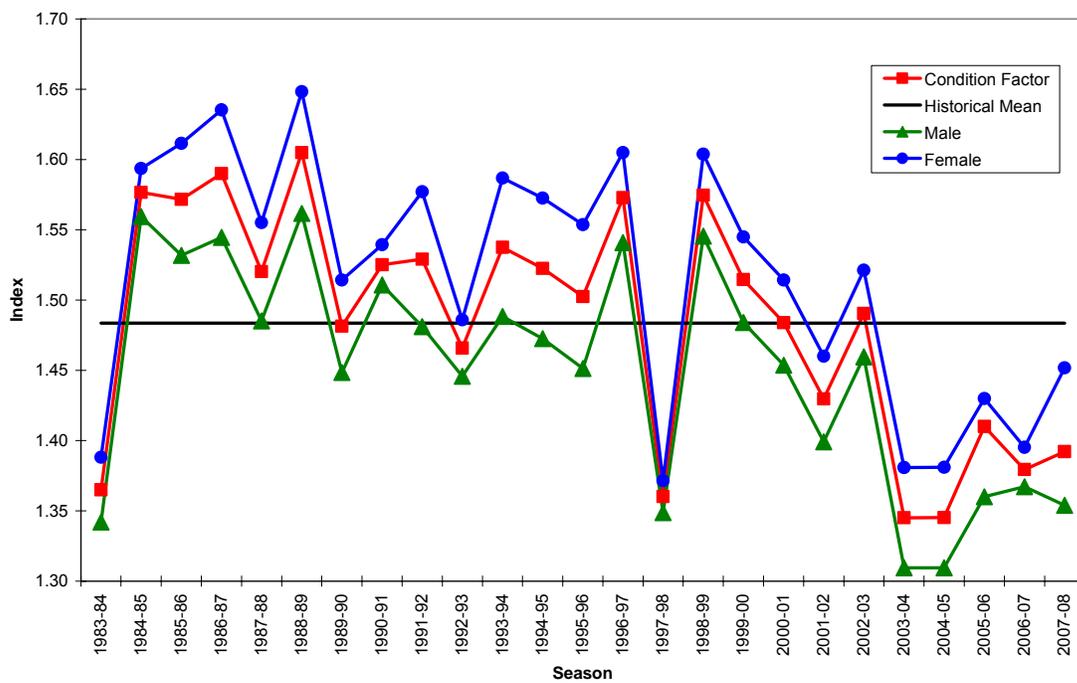


Figure 3.3 Historical condition factor indices for ripe San Francisco Bay herring

3.3.1 San Francisco Bay Herring Young of the Year (YOY)

Pacific herring young-of-the-year (YOY) are commonly caught for the Interagency Ecological Program for the San Francisco Estuary by the Department's San Francisco Bay Study (SFBS) during the spring and summer of each year. The SFBS conducts surveys to determine the abundance and distribution of invertebrates and fishes in the Western Delta and San Francisco Bay. Stations are sampled using a variety of research nets and other equipment, including a midwater trawl that is towed obliquely through the water column to capture species inhabiting varying depths. An index of abundance is calculated for YOY Pacific herring (Fleming 1999).

The herring YOY abundance index for 2007 was the highest since 2003 but remained below the long-term average index for the fourth consecutive year (Figure 3.4). The strength of the YOY indices for the 2000 to 2003 year classes indicated favorable environmental conditions for YOY survival and growth within San Francisco Bay; however, the low indices from 2004 through 2007 (Hieb et al, in press) may reflect unfavorable conditions relative to growth. The low 2007 index may indicate poor recruitment of this cohort to the spawning population in 2009-10 and 2010-11 seasons as two- and three-year old herring. However, there is no strong predictive relationship, historically, between the YOY abundance index and the subsequent numbers of two- and three-year old herring that return to spawn. Survival to first reproduction is affected by a number of factors during the first two to three years of life, including predation, food availability, competition, and environmental conditions.

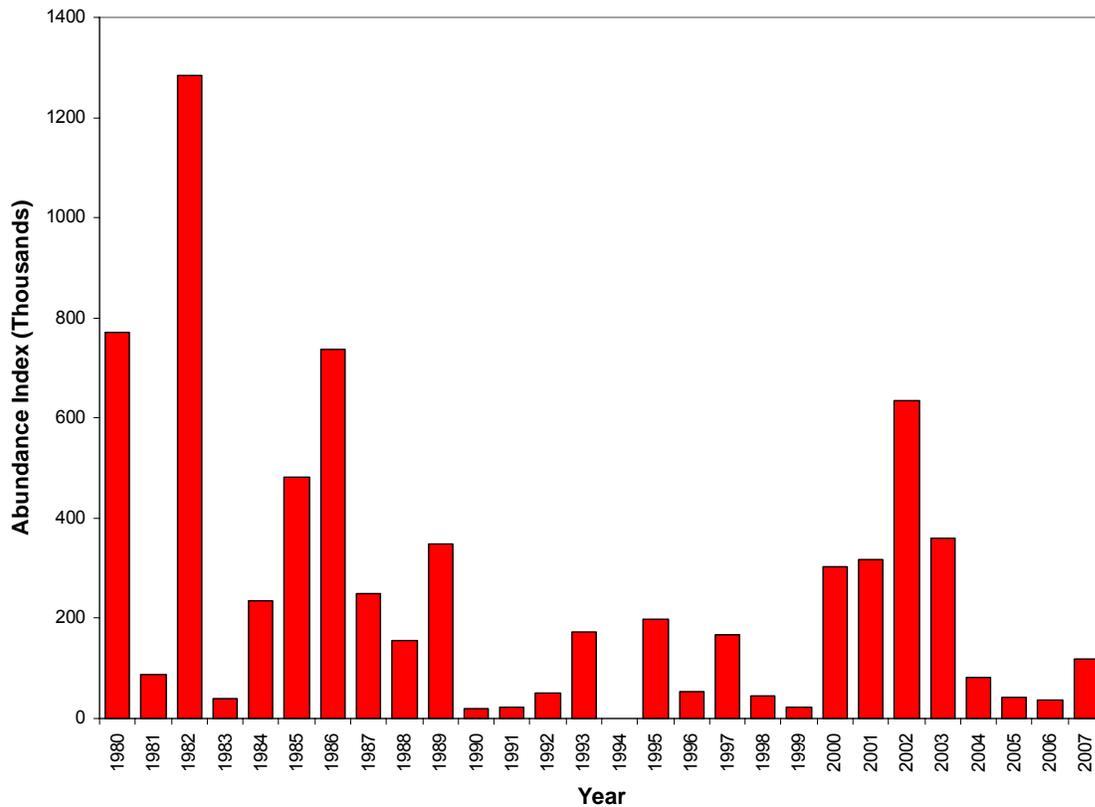


Figure 3.4 San Francisco Bay herring young-of-the-year abundance indices: 1980-2007

3.3.2. *Cosco Busan* Oil Spill and Potential Impacts to San Francisco Bay Herring

On November 7, 2007, the container ship, *Cosco Busan* spilled an estimated 58,000 gallons of bunker fuel (IFO 380) into San Francisco Bay. Due to the timing of the oil spill, herring resources were potentially impacted. Since the spill occurred prior to the majority of spawning schools entering the bay, the most likely impact would be to spawning habitat and egg and larval development in contaminated areas. Previous studies, conducted after the *Exxon Valdez* oil spill, on herring egg and larval development exposed to weathered oil and polycyclic aromatic hydrocarbons (PAH) indicate impacts range from increased egg mortality to larval developmental abnormalities resulting in poor survival. Significantly higher herring egg and larval mortality was found in oiled versus non-oiled areas which supports the hypothesis that oil exposure decreases survival and hatching success in late stage embryos (McGurk and Brown 1996). Norcross et al (1996) found herring larvae from oiled areas had low

growth rate and high proportions of deformities such as craniofacial defects. Larvae from un-oiled areas in Prince William Sound had less severe abnormalities due to oil exposure through the water column or contaminated prey. PAH compounds found in oil selectively disrupt embryonic cardiac function and indirectly affect other tissues that are secondary to cardiovascular dysfunction (Incardona et al 2004). Sublethal effects resulting from oil exposure such as abnormalities can become lethal at later stages and environmental variables can alter the baseline of sublethal indicators (Hose et al 1996). Carls et al (2002) reviewed the toxicological impacts on Pacific herring from the *Exxon Valdez* oil spill found 4-6 percent of the spawn occurred within visibly oiled areas. However, elevated concentration level of biologically available oil was found in the water, providing evidence that the primary source of herring egg oil contamination was through the water. While crude oil and bunker fuel oil may have different chemical properties, the potential oil related impacts on herring may be similar. The exposure of San Francisco Bay herring and herring spawning habitats to oil from the *Cosco Busan* may lead to reduced year class strength and further delay stock rebuilding for an already depressed stock.

A Natural Resources Damage Assessment (NRDA) team conducted a study of egg and larval development in oiled and non-oiled areas in San Francisco Bay; however, the results have yet to be released. Field observations by Department staff indicated that significant areas were oiled this season due to the spill. A review of existing literature indicates that potential impacts of oil exposure on herring may negatively affect year class strength, but similarly, other environmental conditions could negatively affect year class strength. Pacific herring have an evolved reproductive strategy to withstand predation, environmental uncertainties, and stochastic events. However, the current population remains at low levels and significant increases in mortality at any life history stage can delay stock rebuilding. The findings of the NRDA report will assist in determining the immediate and long-term impacts to herring resources and assist in amending San Francisco Bay herring management strategies, if warranted.

Chapter 4. ENVIRONMENTAL IMPACT ANALYSIS AND CUMULATIVE EFFECTS

This chapter addresses the impacts and cumulative effects of the proposed project (changes to the commercial herring fishing regulations) on the existing environment described in Chapter 3 of this document and Chapter 3 of the Final Environmental Document (FED). The proposed project and two of the three alternatives will permit a continuation of the regulated commercial harvest of Pacific herring (*Clupea pallasii*) in California. An analysis of the impacts of the proposed project is discussed in this Final Supplemental Environmental Document (FSED).

Existing regulations permit the commercial harvest of herring in five geographical areas; San Francisco Bay, Tomales Bay, Humboldt Bay, the Crescent City Harbor area, and the open ocean. Chapter 4 of the FED examined the environmental sensitivity of each of these areas at existing harvest levels. Thirteen environmental categories were considered, including; land use, traffic circulation, water quality, air quality, housing, public utilities, geological, biological, archaeological, scenic, recreation, noise, and growth inducement. Three categories (land use, archaeology, and growth inducement) were considered to have no environmental sensitivity to commercial herring fishery activity in any of the five geographical areas and were not considered in the impact analysis. Potential impacts relative to the above categories were re-examined annually and addressed in the Supplemental Environmental Document (SED). The basis for this assessment is provided in detail in Section 4.1 of the FED.

Section 4.2 of the FED provided a detailed impact analysis for the 10 categories found to have environmental sensitivity to commercial herring fishery activity. Potential impacts to traffic circulation, water quality, air quality, housing and utilities, geology, scenic quality, recreational opportunities, and noise levels that were identified as an aspect of herring fisheries varied in degree with geographic area, but all were considered to be localized, short-term, and less than significant. Some of these potential impacts are mitigated by various existing regulations.

Section 4.2.6 of the FED provided a detailed analysis of the potential environmental impacts to biological resources that exist from commercial herring fisheries. The proposed project adds no new impacts to be analyzed.

The FED divided potential impacts into two categories: (1) direct harvest impacts; and (2) trophic level impacts. Short and long term potential adverse impacts exist within each of these categories. Many of these potential impacts are mitigated by current management practices including annual stock assessments and regulations that control harvest and fishery impacts. Others are considered localized, short-term and less than significant.

Chapter 5 of the FED provided a detailed analysis of the factors that have the capacity to influence future Pacific herring population status in California in addition to the existing herring fisheries or alternatives (cumulative effects). The proposed project introduces no new cumulative effects to those addressed by the FED. The FED discussed in detail the factors with greatest potential for cumulative effects, including: continued commercial harvest of herring, unusual biological events, competitive interactions with other pelagic fish, unusual weather events, habitat loss, and water quality. Mitigation for these potential cumulative effects will be provided by annual stock assessments, annual changes in the level of harvest, or the selection of a no fishery alternative.

The California Department of Fish and Game (Department) identified and addressed impacts and cumulative effects of the proposed project on the existing environment described in Chapter 3 of the FED, subsequent FSEDs, and this FSED. No impacts were identified that were not already addressed in the FED or prior FSEDs. Other impacts identified were determined to be localized, short-term, and less than significant.

Chapter 5. ANALYSIS OF ALTERNATIVES

An analysis of the potential environmental impacts of the three alternatives described in Section 2.4 is provided in Chapter 6 of the Final Environmental Document (FED). Three commercial harvest alternatives were selected for consideration by the California Fish and Game Commission (Commission) based on the California Department of Fish and Game's (Department) recommendation, public comment received during the normal review process, or in response to the Notice of Preparation (NOP). These alternatives were selected to provide the Commission with a range of commercial harvest alternatives. The two commercial harvest alternatives contain common elements with only selected elements of the management framework considered as alternatives. A "no project" (no commercial harvest of herring within California state waters) alternative is also provided.

5.1 Alternative 1 (no project)

The "no project" alternative would eliminate the commercial harvest of Pacific herring (*Clupea pallasii*) resources within California waters. Selection of this alternative would be expected to: (1) reduce total mortality and allow herring stocks to increase to carrying capacity; (2) increase competition between species (e.g., sardines and anchovies) occupying the same ecological niche as Pacific herring and potentially reduce standing crops of these species; (3) increase the availability of herring to predators by reducing search effort and increasing capture success; (4) eliminate the ethical concern of those opposed to the commercial harvest of herring and the scientific information on herring derived from sampling the commercial harvest; and (5) eliminate revenues to local and regional economies, and State and Federal agencies derived from the commercial harvest of herring.

Localized, short-term, and less than significant impacts to traffic circulation, water quality, air quality, housing, utilities, scenic quality, recreational opportunities, and noise levels would also be eliminated under the no project alternative. Section 6.1 of the FED provides a full analysis of the potential impacts associated with this alternative.

5.2 Alternative 2 (existing regulations)

Existing regulations, adopted in 2007, were for the 2007-08 Pacific herring commercial fishing season. These regulations reflect the amendments as adopted by the Commission in October 2007. Under Alternative 2, no changes would be made to revise the herring fishing seasons by location, and adjust quotas to reflect the 2007-08 biomass estimate determined by the Department. In most regards, the environmental impacts of Alternative 2 will be similar to those of the proposed project.

Alternative 2, however, does not address problems or conditions that are addressed by the proposed project.

5.3 Alternative 3 (individual vessel quota)

This alternative modifies Alternative 2 by establishing individual boat quotas for the roe herring gill net fishery in San Francisco Bay. Localized, short-term, and less than significant impacts of this alternative to circulation of traffic, water quality, air quality, housing, utilities, scenic quality, recreational opportunities, and noise levels are expected to be comparable to the proposed project. However, fishing effort could extend further into the season since the economic incentive would direct effort toward higher roe counts rather than quantity resulting in high-grading or throwing back males. Without individual boat quotas, overall quotas have typically been met long before season closure. Having the latitude to strive for higher roe counts could add incrementally to the potential impacts associated with the fishery. Section 6.3 of the FED provides further analysis of the potential environmental impacts of this alternative.

Chapter 6. CONSULTATION

Chapter 7 of the Final Environmental Document (FED) explains the role that consultation with other agencies, professionals, and the public plays in the California Department of Fish and Game (Department) marine resource management programs. Department staff, involved in herring resource management, is in contact with other agencies, professional biologists and researchers involved in herring management on a regular basis. The U.S. Fish and Wildlife Service, NOAA-Fisheries Service, U.S. Environmental Protection Agency, and other state and federal agencies received all environmental documents that have been prepared regarding Pacific herring (*Clupea pallasii*). To date, we have not received any comments from these agencies.

Consultations also occur during the annual review of regulations guiding the commercial harvest of herring. The process began this year when the Department presented the results of its annual population assessment and discussed possible regulatory changes for the 2008-09 season with the Director's Herring Advisory Committee (DHAC) on April 17, 2008.

Proposed changes to the regulations for the 2008-09 season were modified, as necessary, based on comments from the DHAC. These recommendations were presented to the California Fish and Game Commission (Commission) at their June 27, 2008, meeting.

Prior to preparation of the FSED, the Department initiated a broader consultation by distributing a NOP that announced the intent to prepare the document dated May 9, 2008. In the NOP, the Department requested submission of views on the scope and content of the environmental information to be contained therein. The notice was distributed to members of the public and interested organizations that had expressed prior interest in herring management. The NOP was also provided to the State Clearinghouse for distribution to appropriate responsible and trustee agencies.

Chapter 7. RESPONSES TO COMMENTS REGARDING THE PROPOSED PROJECT

Pursuant to Sections 2180.5 (d)(2)(vi) and 2180.5 (d)(3) (ii) of the Public Resources Code, a copy of the Draft Supplemental Environmental Document (DSED) was placed on file and made available for public review for a 45-day period. Notice was also given at the time of filing that any person interested in commenting on the DSED should do so, in writing, by 5:00 p.m. on August 8, 2008, to the Fish and Game Commission office in Sacramento. Written and oral comments relative to the DSED were also solicited by the Commission at its June 27, 2008, meeting in Upland.

7.1 Summary of Comments Received

Written comments regarding the DSED were received by the Commission office from Harold Ames on July 15, 2008, and Catharine Benediktsson Letter dated July 24, 2008. An oral comment was presented by Sam Liberati (Directors Herring Advisory Committee Co-Chairman), at the August 8, 2008, Commission Meeting.

7.2 Department Responses to Comments

Harold Ames Letter dated July 15, 2008

Comment 1

Mr. Ames stated that the Vilicich facility (Marshall Boat Works) in Tomales Bay is in bad condition; there is no place to tie boats because the docks are gone and they are unable to replace them. Mr. Ames also stated that north winds in the summer and southerly storms in the winter will make it impossible to have a boat in the water and to fish. With such limited facilities it will be almost impossible for the herring buyers to buy fish.

Department Response

Comment noted.

Comment 2

With this in mind (bad condition of Marshall Boat Works), the Tomales Bay Herring Permittees would like to fish outside of Tomales Bay in the Bodega outer bay from Stemple Creek west – the same area as fished before.

Department Response

For several seasons prior to 1992-93, Tomales Bay was closed to fishing to allow for the spawning population to rebuild. During this time, a small fishing quota was allowed for outer Bodega Bay. Tomales Bay was reopened to herring fishing in 1992-93 with the provision that no fishing would be allowed in outer Bodega Bay by Tomales Bay Herring Permittees. The recommendation to close outer Bodega Bay to herring fishing was made when Department staff determined that obtaining biomass estimates in that area was not feasible, and no information would be available for setting annual quotas. There is currently no information available on the origin and population biomass of Pacific herring found in the outer Bodega Bay, thus a fishery in this area can still not be adequately monitored and assessed by the Department.

Comment 3

With no salmon season Mr. Ames believes that the fishermen from Bodega Bay need this (the outer bay area fishing area) to supplement their income.

Department Response

Comment noted.

Catharine Benediktsson Letter dated July 11, 2008

Comment 1

Ms. Benediktsson stated that there were no gatherings of seagulls feeding on herring or roe last season, anywhere around the Tiburon coastline. This summer she saw a huge number of jellyfish on the beaches. She explained that the two – fisheries and jellies, have been discussed in the scientific community world wide recently. She also stated that jellies compete with the fish for food apparently and fewer fish leads to more jellies.

Department Response

Department trawl data do not show a correlation between high fish abundance and low jellyfish abundance in San Francisco Bay. On the contrary, conditions that favor jellyfish appear to also be beneficial for many fish species.

Comment 2

Ms. Benediktsson expressed her concern that the herring fishery is in trouble, as is the salmon fishery. She stated the Department has been given the job of managing the fishery to health, not extinction. Until the herring come back in significant quantities, Ms. Benediktsson stresses the Department must lower the quota.

Department Response

The Department continues to be concerned about the status of the herring population in San Francisco Bay. Consequently, our recommendation provides for a sustainable harvest while taking into account the depressed condition of the stock. The Department's recommendation for the 2008-09 season is 1,118 tons, which is 10 percent of the 2007-08 spawning biomass.

In addition, the quotas for the San Francisco Bay herring fishery are not determined by a fixed percentage, but rather from within a range of values, the upper bound of which should not be exceeded in order to maintain a sustainable fishery. The selection of a quota from within that range is based on additional biological and fishery data collected each season, such as growth rates, strength and importance of individual year-classes, recruitment of incoming year-classes, and oceanographic conditions.

Comment 3

Ms. Benediktsson requests the boats have mufflers on them when fishing at night, and to stay 500 feet from the houses on shore.

Department Response

Although there is no regulation prohibiting boats from fishing within 500 feet from shoreline residences at night, the Department has worked with fishing industry representatives to develop noise reduction measures to reduce disturbance to shoreline residents from night time fishing activity. These measures are incorporated into Sections 163, Title 14, California Code of Regulations, and include; noise dampening devices for shakers and anchor chains, muffled engine exhaust systems, limited use of deck speakers, and/or reduced speed within 500 feet of shore. This regulation also states that herring permittees shall recognize city ordinances governing transient noise sources, when fishing within 500 feet of any shoreline with residential dwellings.

Sam Liberati (Directors Herring Advisory Committee Co-Chairman), in oral comment at the August 8, 2008, Commission Meeting

Comment 1

Mr. Liberati began by complimenting the biologists on a job well done. He believes the industry is satisfied with the Department (Fish and Game). The industry would like to continue to improve the working relationship with the Department and looks forward to no further conflicts. The industry and Mr. Liberati look forward to coming to the Commission in the future with positive changes in how this fishery is managed.

Department Response

Comment noted.

Comment 2

Mr. Liberati stated that both the industry and the Department would like to bring herring regulations “up to date,” saving time and money for both parties.

Department Response

Comment noted.

Comment 3

Mr. Liberati stated that the industry continues to be dissatisfied with the results of the peer review. Fishermen believe they should have been involved in the review process.

Department Response

In 2003 an independent peer review of the Department’s commercial Pacific herring fishery management was administered by California Sea Grant. Peer review panel members included fishery scientists from the University of California, NOAA Fisheries, Inter American Tropical Tuna Commission, and the Canadian Department of Fisheries and Oceans. Recommendations from this peer review have been incorporated into the Department’s herring fishery management program.

Comment 4

Mr. Liberati reiterated that the industry does not agree with the current survey methods used to determine herring biomass. The Department historically averaged the hydroacoustic and spawning biomass surveys to determine

population size. They now only use the spawning biomass (spawn deposition) survey method. This method frequently misses deep water spawn events.

Department Response

The independent peer review of the Department's spawning biomass estimation methodology found that the hydro-acoustic method tended to overestimate the spawning biomass, and the spawn deposition survey was a better estimator of spawning biomass. The Department discontinued the hydroacoustic survey as a secondary biomass estimation technique.

Comment 5

The Department use to have very poor survey equipment; the industry stepped in and proposed the herring stamp to fund better equipment for herring management.

Department Response

Comment noted.

7.3 Copy of Letters Received

To: John Carlson Jr.
Exec Director
Fish & Game

Copy

CALIFORNIA
FISH AND GAME
COMMISSION

2000 JUL 15 PM 2:2

The docks which facilities at Sausal Bay are in such bad condition, the docks are gone & there is no place to tie the boats & at this point they are unable to replace them. With the North winds in the summer & the southerly storms in the winter it would be impossible to have your boat in the water & fish. With such limited facilities it would be almost impossible for the Herring buyers to buy fish. ①

With this in mind we would like to fish on the outside of Sausal Bay - in Bodega outlying - ~~between~~ Stemple Creek west the same area as before. ②

With no Salmon season I feel that the fishermen from Bodega Bay need this to supplement their income from the lack of Salmon season. ③

If you have any questions John, feel free to call me at 707-875-3534

Harold Ames
P.O. Box 4
Bodega Bay -
Ca - 94923

NORTH BAY CA 949

10 JUL 2000 PM 2:1

Mr. John Carlson Jr.
Exec.

P.M. 1320

1416 9th St.

Sacramento, Ca -

958.

From: C Benediktsson <cben@pacbell.net>
To: <FGC@fgc.ca.gov>
Date: 7/24/2008 1:21 PM
Subject: Title 14, FGC Notice of Proposed Changes in Regulations

Marine Region, CA Department of Fish and Game
707-441-5755

Mr. John Mello,

July 11, 2008 a letter was sent out on the proposed regulatory action relating to commercial herring regulations which appeared in the CA Regulatory Notice Register on July 18, 2008.

The concern here is with the herring fishery.

I live on the water in Tiburon. This last season, there were NO gatherings of seagulls, anywhere around the Tiburon coastline going after herring. This summer we have had a huge number of jellyfish on the beaches. Moon jellies I think. The two - fisheries and jellies, have been discussed in the scientific community world wide recently. Jellies compete with the fish for food apparently. Fewer fish leads to more jellies. }

①

I am very concerned that the herring fishery is in trouble, as is the salmon fishery. }

You have been given the job of managing the fishery to health, not extinction. }

②

Until the herring come back in significant quantities, you must lower the quota. }

As always, we request for the boats to have mufflers on them when fishing at night, and to stay 500 feet from the houses on shore. }

③

Thank you,
Catharine Benediktsson

2352 Mar East St.
Tiburon, CA 94920

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Appendix A

Summary of Changes

Summary of Changes to the 2008 Draft Supplemental Environmental Document for Pacific Herring Commercial Fishing Regulations

This appendix provides a summary of the changes made to the Draft Supplemental Environmental Document (DSED) based updated information on age data for San Francisco Bay, and minor grammatical changes for clarity.

General changes throughout the Document

- References to the DSED were changed to FSED (Final Supplemental Environmental Document) where applicable.
- Misspellings, grammatical errors, and errors in graph or table identification, were corrected.

Table of Contents

- The table of contents was **revised** to match any page numbers that changed during the process of finalizing the FSED document.
- Appendix A, Summary of Changes was added.

Summary

- The following text was added to S.1 Introduction: Chapter 7 describes the period for public review. Appendix A, Summary of Changes, was added to illustrate what changes were made to the DSED in order to finalize the supplemental document. References used throughout this FSED are listed in the Literature Cited section.

Chapter 1. Introduction

- The following text was changed to Section 1.5 to show exact location of the Lake Tahoe area Commission Meeting: These meetings will be held for the 2008-09 season on August 8, 2008, in Carpinteria and in Kings Beach on September 5, 2008.

Chapter 2. Project Description

- Section 2.3.1.1, paragraph 1 following sentence was replaced for clarification: Size selectivity and efficiency of gill nets is dependent upon mesh size, and three-year old herring would be more vulnerable to the two inch mesh than the larger mesh sizes that were previously allowed, especially when growing conditions for herring are optimal.
- Section 2.3.1.1, paragraph 2 was updated using final age data. The following sentences were replaced: The ageing of commercial samples was not completed in time to be included in this DSED. Preliminary age estimates were generated using 2007-08 commercial length data and 2006-07 final commercial age structure, to approximate commercial ages for this DSED. Based on preliminary age estimates for the commercial catch this season (Figure 2.5),

there was an increased take of three-year old herring over the prior season, and slightly above the commercial historical take of three-year olds. The percentage of three-year old herring may have increased in the commercial catch due to improved growth, resulting in larger-at-age herring that are more susceptible to the selectivity of two inch mesh gill nets, and/or the decrease in the number of available four-year old and older herring in the spawning population.

- Figure 2.5 was updated using final age data of herring based on otolith readings. The DSED has preliminary age data based on lengths for 2007-08.

Chapter 3. Environmental Setting

- Section 3.3, paragraph 4 - The following text was deleted and replaced with updated information using final age data based on otolith readings: The research fish samples were not aged in time to be included in this DSED, so preliminary age estimates were generated using 2007-08 research length data and 2006-07 final research age structure, to approximate research ages for the DSED. These age estimates were used to estimate the preliminary number of herring at age in the San Francisco Bay spawning population. While the herring population has experienced a truncation of age classes, the current age composition reflects significant declines in the estimated numbers of age four and older herring in the spawning biomass. The estimated numbers of age four and older herring this season are near historic lows, and the estimated numbers of other age classes are well below average (Table 3.2). The percentage of four-, five-, and six-year old herring in the spawning population, which have historically comprised the majority of the catch, decreased, and the available biomass at those age classes declined (Figure 3.1). Despite these factors, the commercial catch increased this season as herring appeared to return to San Francisco Bay in a better condition than last season.
- Table 3.2 was updated using final age data of herring based on otolith readings. The DSED has preliminary age data based on lengths for 2007-08.
- Figure 3.1 was updated using final age data of herring based on otolith readings. The DSED has preliminary age data based on lengths for 2007-08.
- Section 3.3, paragraph 5 - The following text was deleted and replaced with updated information using final age data based on otolith readings: Preliminary research age data for the past season continues to show that age four and older herring have declined in the spawning population while the percent of age two and three have increased. One of the Department's herring fishery management goals is to allow the harvest of age four and older herring and to avoid the harvest of two- and three-year old fish, many of which are first-time spawners. Preliminary commercial age data showed an 11 percent increase in age three herring taken by the gill net fishery compared to last season. The Department remains concerned about a coast-wide trend in decreasing mean length at age, and a truncation in age-classes reported for herring fisheries along the eastern Pacific coast since the 1997-98 El Niño.
- Minor editorial changes were made.

Chapter 4. Environmental Impact Analysis and Cumulative Effects

- No changes

Chapter 5. Analysis of Alternatives

- Section 5.1, paragraph 1 - The following text was deleted and replaced with updated information using data based final population estimates: The "no project" alternative would eliminate the commercial harvest of Pacific herring (*Clupea pallasii*) resources within California waters. Selection of this alternative would be expected to: (1) reduce total mortality and allow herring stocks to increase to carrying capacity; (2) increase competition between species (e.g., sardines and anchovies) occupying the same ecological niche as Pacific herring and potentially reduce standing crops of these species; (3) increase the availability of herring to predators by reducing search effort and increasing capture success; (4) eliminate the ethical concern of those opposed to the commercial harvest of herring and the scientific information on herring derived from sampling the commercial harvest; and (5) eliminate revenues to local and regional economies, and State and Federal agencies derived from the commercial harvest of herring.
- Section 5.2, paragraph 1 - The following text was deleted and replaced for clarification with: Under Alternative 2, no changes would be made to revise the herring fishing seasons by location, and adjust quotas to reflect the 2007-08 biomass estimate determined by the Department.

Chapter 6. Consultation

- No changes

Chapter 7. Responses to Comments

- This chapter is added to all Final Supplemental Environmental Documents where comments are received.

Appendix A Summary of Changes

- Added