11. COMMERCIAL HERRING

Today's Item **Information** ☐ **Action** ☒

Certify the final supplemental environmental document, adopt the proposed project, and adopt proposed changes to commercial herring regulations.

Summary of Previous/Future Actions

- Notice hearing — Aug 4-5, 2015; Fortuna
- **Today's discussion/adoption hearing** — **Oct 7-8, 2015; Los Angeles**

Background

FGC annually adopts commercial herring regulations to establish fishing quotas. Proposed changes to the commercial harvest of herring and herring eggs on kelp for 2016 include:

Recommended Amendments to Section 163

- Amend Subsection 163(g)(4) by deleting the current quota of "2,500" tons and replacing it with a quota selected by FGC based on a range from zero (0) to five percent of the preceding year's spawning biomass estimate; and deleting "2014-2015". DFW is recommending a five percent quota equal to 834 tons.

Recommended Amendments to Section 164

- Amend Subsection 164(g)(3) by changing the form FG 143 HR (Rev. 2/14) to DFW 143 HR (REV. 06/04/15). The revision is necessary to conform to DFW standards and to create a form without the need for an annual update. The old and revised forms are attached to this rulemaking.
- Amend Subsection 164(h)(2) to change the application deadline for renewal of all herring eggs om kelp (HEOK) permits to be received by DFW, or if mailed, postmarked, on or before the first Friday of October each year. This change in the deadline will align the renewal dates for all other herring permits and be less confusing for the herring permit holders.
- Amend Subsection 164(j)(4) by increasing the quota allocation for HEOK permits from 0.79 to 1.0 percent of the overall quota as specified in Section 163 for harvest of herring.

Significant Public Comments (N/A)

Recommendation

FGC staff: Adopt the proposed changes as recommended by DFW.

DFW: Adopt proposed regulations.

Exhibits

1. DFW memo, received Jul 8, 2015
2. ISOR
3. Final supplemental environmental document
4. DFW memo, dated Aug 31, 2015
5. DFW presentation

Motion/Direction

Moved by _____ and seconded by _____ that the Commission certifies the final supplemental environmental document, adopts the proposed project, and adopts proposed changes to subsections 163(g)(4), et al., related to commercial harvest of herring and harvesting of herring eggs.

State of California
Department of Fish and Wildlife

Memorandum

Date: July 8, 2015

To: Sonke Mastrup
Executive Director
Fish and Game Commission

From: Charlton H. Bonham
Director

Subject: **Agenda Item for the August 4, 2015 Fish and Game Commission Meeting Request for Notice Authorization Re: Harvest of Herring and Harvesting of Herring Eggs**

The Department of Fish and Wildlife (Department) requests that the Fish and Game Commission (Commission) authorize publication of notice of its intent to amend the regulations for the 2015-16 commercial herring fishery. The attached Initial Statement of Reasons (ISOR) is provided in support of the proposed amendments to Sections 163 and 164, Title 14, California Code of Regulations.

As described in the 2015 Draft Supplemental Environmental Document (DSED) for Pacific herring, the Department is providing the Commission a quota option range for the 2015-16 season from zero to five percent of the 2014-15 San Francisco Bay spawning biomass estimate. The Department recommends a conservative harvest option of 834 tons for the 2015-16 season. This amount is equal to five percent of the 16,674 ton 2014-15 spawning biomass estimate in San Francisco Bay. The Department is also providing the Commission a quota option for the Herring-Eggs-On-Kelp (HEOK) fishery to increase the total quota allocation from 0.79 to 1.0 percent. This fishery is regulated with the gill net fishery and the quota will be allocated as a proportion of the overall quota set each season for San Francisco Bay.

In addition, the Department is recommending that the Commission adjust the permit renewal date for the HEOK fishery to align with the gill net fishery due date. This would move the current due date for HEOK permits from August 1 each year to, "on or before the first Friday of October each year." This change would allow greater efficiency and time savings during the annual permit renewal process by the Department's License and Revenue Branch.

Should you have further questions or need additional information, please contact Dr. Craig Shuman, Regional Manager of the Department's Marine Region at (805) 568-0216. The public notice for this rulemaking should identify Environmental Scientist, Ryan Bartling as the Department's point of contact. Mr. Bartling can be reached at (707) 576-2877 or Ryan.Bartling@wildlife.ca.gov.

Attachments

ISOR Amend Sections 163 and 164

Std. 399 Economic and Fiscal Impact Statement
Revised FG 143 HR (Rev. 4/15) HEOK Landings and Royalty Report
FG 143 HR (Rev. 2/14) with change highlighted
Herring Interested and Affected Parties List

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STATE OF CALIFORNIA
FISH AND GAME COMMISSION
INITIAL STATEMENT OF REASONS FOR REGULATORY ACTION
(Pre-publication of Notice Statement)

Amend Sections 163 and 164
Title 14, California Code of Regulations
Re: Harvest of Herring and Harvesting of Herring Eggs

I. Date of Initial Statement of Reasons: June 15, 2015

II. Dates and Locations of Scheduled Hearings:

(a) Notice Hearing: Date: August 4, 2015
Location: Fortuna, CA

(b) Discussion and Adoption Hearing: Date: October 7, 2015
Location: Los Angeles, CA

III. Description of Regulatory Action:

(a) Statement of Specific Purpose of Regulation Change and Factual Basis for Determining that Regulation Change is Reasonably Necessary:

The purpose of these regulations is to update the annual quota for the commercial herring fishery taking into account changes to the Pacific herring population (referred to as the "biomass"). The Fish and Game Commission (Commission) and the Department of Fish and Wildlife (Department) are responsible for safeguarding Pacific herring as an important forage species (food source) on which other species depend in marine and estuarine ecosystems. Moreover, the adaptive regulations also help ensure that the fishery is sustainable through the use of precautionary management principles which identify problems and opportunities when setting harvest targets in the commercial fishery. Annual regulation updates are necessary to this fishery as the biomass fluctuates significantly year to year and is key to sustaining the ecosystem, managing the fishing industry, and providing benefits to the people of California through the orderly conduct of commercial fishing activity.

Under existing law, herring (Section 163) and herring eggs (Section 164) may be taken for commercial purposes only under a revocable permit, subject to regulations prescribed by the Commission. Current regulations specify: permittee qualifications, permit application procedures and requirements, permit limitations, permit areas, vessel identification requirements, fishing quotas, seasons, gear restrictions, landing and monitoring requirements, permit categories and conditions, royalty fees,

permit performance deposit requirements, fishing and harvesting restrictions, processing requirements, and permit suspension conditions and procedures.

The Department is proposing regulations that would establish the 2015-16 season quotas for fishing operations in San Francisco Bay and make a minor change to the permit renewal date in the Herring-Eggs-On-Kelp (HEOK) fishery. These changes are necessary to incorporate the most recent biological condition data into herring management and increase the efficiency of herring permitting.

Management recommendations are solicited annually from the Director's Herring Advisory Committee (DHAC) and from interested individuals during public meetings and comment periods. The proposed amendments to sections 163 and 164 reflect Department recommendations based on additional input from the public and support of DHAC representatives. No changes or recommendations are being proposed for fishing areas outside San Francisco Bay.

Environmental Report

Pursuant to the requirements of the California Environmental Quality Act, the Department has prepared a 2015 Draft Supplemental Environmental Document (DSED) to the 1998 Final Environmental Document for Pacific Herring. The Department relied upon the DSED for biological analysis and to make recommendations for regulatory change. The DSED is currently available for public comment and can be found on the Department's Marine Region Website: http://www.dfg.ca.gov/marine/herring/.

Certification of the 2015 Final Supplemental Environmental Document is scheduled to occur at the October 7, 2015, Commission meeting in Los Angeles.

Overview of Herring Management and Environmental Document Summary

As with most coastal pelagic species, herring populations fluctuate depending on a variety of factors, including: food availability, spawning conditions, competition, predation, and fishing pressure. Pacific herring gill net fisheries are regulated in four spawning areas: Tomales Bay, Humboldt Bay, Crescent City area, and in San Francisco Bay, which is the primary fishing area. The HEOK fishery is only allowed in San Francisco Bay. Tomales Bay, Humboldt Bay, and Crescent City area have not been subjected to any fishing pressure for a number of seasons due to poor market conditions and unique site constraints at each location. No changes to quotas are proposed for these three fishing areas for the 2015-16 season. The Department manages the populations in the four spawning areas as

separate stocks. The commercial herring fisheries on these stocks are regulated through a catch quota system to provide for adequate protection and utilization of the herring resource. In San Francisco Bay, the Department conducts annual assessments of the herring spawning population size (spawning biomass). In addition to the assessment of spawning biomass, the Department examines the age composition of the spawning population, growth and general condition, biological aspects of the catch, and environmental conditions. These data serve as the basis for establishing fishing quotas for the next season. Department fishery managers are then able to set appropriate harvest targets, providing a sustainable fishery and ensuring a forage base for other species that depend on herring as a food source.

Annual fishing quotas are necessary to provide for a sustainable fishery and have historically been limited to a total commercial take not to exceed 20 percent (harvest percentage) of the previous season's estimated spawning biomass. This harvest percentage is based upon the results of a peer reviewed model that assumes stable environmental and biological conditions. Quotas are the principal regulatory tool to establish adequate protection for the herring resource and provide for the long-term sustainable yield of the fishery. Each year, the Department recommends a harvest percentage that is not determined by a fixed mathematical formula; rather, the recommendation is based upon the modeling results and takes into account additional data collected each season, including: ocean productivity and estuarine conditions, growth rates of herring, strength of individual year-classes, and predicted size of incoming year-classes (i.e., recruitment). In response to poor recruitment or indication of population stress and/or unfavorable oceanographic conditions, harvest percentages for the past ten years have been set at or below ten percent in San Francisco Bay. The ten year average exploitation rate has been less than four percent. Over the past five years, the Department has recommended even more precautionary harvest percentages which have been less than or equal to five percent of the previous season's estimated spawning biomass. Actual exploitation rates during that five year period have averaged approximately three percent of the total spawning biomass.

Fishing effort and participation has also declined over the ten year period due to a reduction in herring value and lower demand on international markets. The traditional product from this fishery, *kazunoko*, is the sac roe (eggs) removed from the females, which is processed and exported primarily for sale in Japan.

The Department's proposal to make a minor change in HEOK effectively reduces the total herring catch because a larger proportion of the overall quota will be allocated as HEOK. This is beneficial because the HEOK fishery only harvests herring eggs, allowing adult herring to escape, thus

safeguarding a larger portion of the population as an important forage source. This recommendation is also supported by DHAC and members of the conservation community. This allocation is further described in the 2015 DSED, Chapter 2.2, and in Section 163 of these regulations.

The spawning biomass estimate for the 2014-15 season was 16,674 tons, which fell below the historical average (1979-80 season to present) of 51,300 tons. This was a significant decrease in spawning biomass from the previous season's estimate of 60,600 tons, and is the fourth-lowest estimated biomass on record. Accordingly, the Department will continue to recommend a precautionary harvest level for the 2015-16 season to safeguard the herring fishery and protect its role as a key forage species.

Department Recommendations for the San Francisco Bay Herring Fishery

The Department is providing the Commission a quota option range for the 2015-16 season from zero (0) to five percent of the 2014-15 San Francisco Bay spawning biomass estimate of 16,674 tons as described in the 2015 DSED. The Department is recommending a five percent quota equal to 834 tons of Pacific herring.

Department Recommendations for the Herring Eggs on Kelp Fishery

The Department is providing the Commission a quota option for the HEOK fishery to increase the total quota allocation from 0.79 to 1.0 percent. This fishery is regulated with the gill net fishery and the quota will be allocated as a proportion of the overall quota set each season for San Francisco Bay.

The Department is providing the Commission a recommendation to adjust the permit renewal date for the HEOK fishery to align with the gill net fishery due date. This would move the current due date for HEOK permits from August 1 each year to, "on or before the first Friday of October each year". This minor change would allow greater efficiency and time savings during the annual permit renewal process by the Department's License and Revenue Branch.

Recommended Amendments to Section 163

- Subsection 163(g)(4) is amended by deleting the current quota of "2,500" tons and replacing it with a quota selected by the Commission based on a range from zero (0) to five percent of the preceding year's spawning biomass estimate; and deleting "2014-2015". The Department is recommending a five percent quota equal to 834 tons.

Recommended Amendments to Section 164

- Subsection 164(g)(3) is amended by changing the form FG 143 HR (Rev. 2/14) to DFW 143 HR (REV. 06/04/15). The revision is necessary to conform to Department standards and to create a form without the need for an annual update. The old and revised forms are attached to this rulemaking.

- Subsection 164(h)(2) is amended to change the application deadline for renewal of all HEOK permits to be received by the Department, or if mailed, postmarked, on or before the first Friday of October each year. This change in the deadline will align the renewal dates for all other herring permits and be less confusing for the herring permit holders.
- Subsection 164(j)(4) is amended by increasing the quota allocation for HEOK permits from 0.79 to 1.0 percent of the overall quota as specified in Section 163 for harvest of herring.

(b) Authority and Reference Sections from the Fish and Game Code for Regulation:

Section 163:

Authority cited: Sections 1050, 5510, 8550, 8552.1, 8553 and 8555, Fish and Game Code.

Reference: Sections 713, 1050, 7852.2, 8043, 8550, 8552, 8552.6, 8553, 8554, 8555, 8556, 8557 and 8559, Fish and Game Code.

Section 164:

Authority cited: Sections 1050, 5510, 8389, 8552.1, 8553 and 8555, Fish and Game Code.

Reference: Sections 713, 1050, 7850, 7850.5, 7852.2, 7881, 8043, 8053, 8389, 8550, 8550.5, 8552.1, 8552.2, 8552.3, 8552.4, 8552.5, 8552.6, 8552.7, 8552.8, 8553, 8554, 8555, and 8556, Fish and Game Code.

(c) Specific Technology or Equipment Required by Regulatory Change:

None

(d) Identification of Reports or Documents Supporting Regulation Change:

2015 Draft Supplemental Environmental Document for Pacific Herring

(e) Public Discussions of Proposed Regulations Prior to Notice Publication:

Director's Herring Advisory Committee Meeting, April 1, 2015, Sausalito, California.

IV. Description of Reasonable Alternatives to Regulatory Action:

(a) Alternatives to Regulation Change:

No alternatives were identified.

(b) No Change Alternative:

A no-change alternative would not provide a quota or season for the 2015-16 commercial herring fishery. Current regulations specify a quota of 2,500 tons for the 2014-15 season and these regulations cannot apply to subsequent seasons.

A no-change alternative would not increase quota allocation for the HEOK fishery or amend current permit renewal dates.

(c) Consideration of Alternatives:

In view of information currently possessed, no reasonable alternative considered would be more effective in carrying out the purpose for which the regulation is proposed, would be as effective and less burdensome to affected private persons than the proposed regulation, or would be more cost effective to affected private persons and equally effective in implementing the statutory policy or other provision of law.

V. Mitigation Measures Required by Regulatory Action:

The 2015 Draft Supplemental Environmental Document has been prepared to review and analyze the proposed regulations for the commercial harvest of Pacific herring throughout the State's estuarine waters. Other than a recommendation for a new quota for the 2015-16 season, no mitigation measures are necessary.

VI. Impact of Regulatory Action

The potential for significant statewide adverse economic impacts that might result from the proposed regulatory action has been assessed, and the following initial determinations relative to the required statutory categories have been made:

(a) Significant Statewide Adverse Economic Impact Directly Affecting Businesses, Including the Ability of California Businesses to Compete with Businesses in Other States:

Herring roe prices are set on the international market and not directly impacted by California regulations and quotas. Recently, herring roe has declined in value due to a market oversupply and a decline in overall demand. As a result, no adverse incremental economic impact to businesses, including the ability of California businesses to compete with businesses in other states, is anticipated to occur with a quota allocation of 50 tons or more However, a zero ton quota would eliminate any revenues

from the California herring fishery. This impact could be mitigated to the extent that fishermen can pursue other species; the total economic impact should not be significant.

(b) Impact on the Creation or Elimination of Jobs Within the State, the Creation of New Businesses or the Elimination of Existing Businesses, or the Expansion of Businesses in California.

Due to poor market conditions and low participation by the herring fleet during the 2014-15 season, any quota option over 50 tons will likely result in positive incremental contributions to employment for the State: for example, an increase of about 71 jobs for a quota of 834 tons (see section VII). Conversely, a zero (0) ton quota could adversely impact about four jobs in the fishing industry and related industries. This is based on an employment multiplier of 27 jobs per each million dollar change in direct output from commercial herring fishing activities.

Most commercial herring industry participants are small businesses (as defined under California Government Code Section 11342.610), which may incur a detriment under a quota option less than 50 tons for San Francisco Bay. The total harvest of Pacific herring landed during the 2014-2015 season was 46 tons, though the allowable quota was 2,500 tons. This low exploitation rate and participation level by the herring fleet was driven by poor international market conditions. Due to the small scale and seasonality of the California herring fishery it is unlikely that any of the proposed quota options alone would cause the elimination of existing businesses in the State.

(c) Cost Impacts on a Representative Private Person or Business:

The Department is not aware of any cost impacts that a representative private person or business would necessarily incur in reasonable compliance with the proposed action. There are no new fees or reporting requirements stipulated under the proposed regulations.

(d) Costs or Savings to State Agencies or Costs/Savings in Federal Funding to the State: None

(e) Nondiscretionary Costs/Savings to Local Agencies: None.

(f) Programs Mandated on Local Agencies or School Districts: None.

(g) Costs Imposed on Any Local Agency or School District that is Required to be Reimbursed Under Part 7 (commencing with Section 17500) of Division 4: None.

(h) Effect on Housing Costs: None.

VII. Economic Impact Assessment:

Due to the small scale and seasonality of the California herring fishery, the overall economic impact on California business is not anticipated to be significant. Depending on which option is selected by the Commission, the proposed regulations are not anticipated to have significant adverse economic impact directly affecting business, including the ability of California businesses to compete with businesses in other states. For illustration, the following table (California Herring Fishery 2015-16) provides an overview of two quota options with analyses of the projected economic impacts to the State relative to 2014-15 season catch of 46 tons.

California Herring Fishery 2015-16				
(Based on average biomass estimate of 16,674 tons)	No Change	Opt1 5%*	Opt2 0%*	2014-15 Actual Catch
Proposed 2015-2016 Quota in Tons	2,500	834	-	46
Ex-Vessel Revenue Potential (for allowable harvest quota)	$ 1,035,000	$ 345,000	$ -	$ 19,000
Total Economic Output Contribution	$ 1,837,000	$ 612,000	$ -	$ 28,000
Total Earnings (Labor Wages) Contribution	$ 365,000	$ 122,000	$ -	$ 5,100
Total Jobs (Employment) Contribution	97	75	-	4
Total Value-Added Contribution	$ 705,000	$ 235,000	$ -	$ 10,200
Total State & Local Tax Contribution	$ 347,000	$ 31,000	$ -	$ 1,400
Landings Tax Revenue Contribution to CDFW ($.0013/lb)	$ 6,500	$ 2,168	$ -	$ 120
Incremental Impact of Proposed Regulations Relative To Last Season's Allowable Harvest Quota of 2,500 tons				
	No Change	Opt1 5%*	Opt2 0%*	Opt 1 change from Actual Catch
Change in Tons	-	(1,666)	(2,500)	788
Direct Impact to Fishermen Ex-Vessel Revenue	$ -	$ (690,000)	$ (1,035,000)	$ 326,000
Total Economic Output Impact	$ -	$ (1,005,000)	$ (1,837,000)	$ 584,000
Total Earnings (Labor Wages) Impact	$ -	$ (186,000)	$ (365,000)	$ 117,000
Total Jobs (Employment) Impact	-	(21)	(97)	71
Total Value-Added Impact	$ -	$ (370,000)	$ (705,000)	$ 225,000
State & Local Taxes Impact	$ -	$ (51,000)	$ (347,000)	$ 29,600
Landings Tax Revenue to CDFW ($.0013/lb)	$ -	$ (4,300)	$ (6,500)	$ 2,050
** % of biomass (16,674 tons).*				

The projected economic impacts and the incremental economic impacts under each option, relative to the last season's allowable harvest of 2,500 tons of Pacific herring in San Francisco Bay along with the impacts of the actual catch taken over the 2014-15 season are estimated. The proposed Option 1 for five percent of the 16,674 ton biomass estimate (an 834 ton allowable quota) represents a quota reduction of 1,666 tons from the 2014-15 quota.

If the total allowable harvest quota had been met over the 2014-15 season, the Option 1 quota could result in drops in total economic output as shown in the incremental impact portion of the California Herring Fishery 2015-2016 table. However, over the 2014-15 season, the actual landings recorded were 46 tons, substantially below the allowable harvest quota. Compared to the actual catch, the proposed Option 1 quota of 834 tons could result in an increase in total economic output should the catch exceed 46 tons.

The 2015-16 quota options for San Francisco Bay range from zero (0) to five percent of the 2014-15 spawning biomass estimate of 16,674 tons. The potential incremental changes to total State economic output for these three options: no change; five percent of the biomass (834 tons); or zero percent of the biomass estimate (0 tons) are: none, $(1,005,000), or $(1,837,000) respectively, relative to 2014-15 season's 2,500 ton allowable quota and the ex-vessel price per ton.

(a) Effects of the Regulation on the Creation or Elimination of Jobs Within the State:

Any quota option over 50 tons has the potential to result in positive incremental contributions to employment for the State. The proposed Option 1 quota of 834 tons could result in about 71 additional jobs. The proposed Option 2 quota of zero tons could adversely impact approximately four jobs in the fishing industry and related industries. This is based on an employment multiplier of 27 jobs per each million dollar change in direct output from commercial herring fishing activities. In addition, under a zero ton quota, the existing 190 herring permittees would be unable to fish for herring. The extent to which these fishermen may be able to fish for other species during the herring season is unknown.

(b) Effects of the Regulation on the Creation of New Businesses or the Elimination of Existing Businesses Within the State:

It is unlikely that any of the proposed quota options shown above would alone cause the elimination of existing businesses in the State.

(c) Effects of the Regulation on the Expansion of Businesses Currently Doing Business Within the State:

It is unlikely that any of the proposed quota options shown above would alone cause the expansion of existing businesses in the State.

(d) Benefits of the Regulation to the Health and Welfare of California Residents:

The proposed action(s) recommended by the Department are to ensure the sustained availability of Pacific herring resources, in support of goals and benefits set forth in the California Fish and Game Code.

(e) Benefits of the Regulation to Worker Safety:

The proposed regulations do not affect worker safety because they only set fishing quotas.

(f) Benefits of the Regulation to the State's Environment:

The expected benefits to the environment take the form of sustainable herring fisheries, and benefits to persons, businesses, and species dependent upon a healthy herring resource.

(g) Other Benefits of the Regulation:

The proposed changes to the regulations support the Marine Life Management Act (MLMA) [MLMA, Statutes 1999 Chapter 483], which declares that “conservation and management programs prevent overfishing, rebuild depressed stocks, ensure conservation, facilitate long term protection and, where feasible, restore marine fishery habitats".

INFORMATIVE DIGEST\POLICY STATEMENT OVERVIEW

Sections 163 and 164, Title 14, California Code of Regulations, specify that herring may be taken for commercial purposes only under a revocable permit, subject to such regulations as the Fish and Game Commission shall prescribe. Current regulations specify: permittee qualifications, permit application procedures and requirements, permit limitations, permit areas, vessel identification requirements, fishing quotas, seasons, gear restrictions, and landing and monitoring requirements.

Annual fishing quotas are necessary to provide for a sustainable fishery. The proposed regulatory changes in Section 163 will establish the fishing quota for the 2015-16 season in San Francisco Bay:

- Set the San Francisco Bay quota for the 2015-16 season from zero (0) to five percent of the 2014-15 San Francisco Bay spawning biomass estimate for Pacific herring as provided in the 2015 Draft Supplemental Environmental Document. The Department is recommending a quota of five percent or 834 tons.

The proposed regulatory changes in Section 164 will establish the HEOK fishing quota and amend the permit renewal date and form for the San Francisco Bay fishery:

- A minor editorial change will be made to Section 164 indicating a change in the revision date (Rev. 2/14) to (Rev. 06/04/15) on the HEOK Royalty Report Form.

- A minor change will be made to Section 164 indicating that renewal of all HEOK permits are to be received by the Department, or if mailed, postmarked, on or before the first Friday of October each year. The revision is necessary to update the “permit application date” and align with the renewals dates for all other herring permits.

- Increase the San Francisco Bay HEOK quota allocation for individual HEOK permits from 0.79 to 1.0 percent of the overall quota as specified in Section 163 for harvest of herring.

<u>Benefits of the Regulation</u>

The Commission anticipates benefits to the State’s environment and the health and welfare of California residents. The proposed regulation changes are intended to set annual harvest quotas within a range that will maintain sustainable herring populations for their ecological values and commercial use. Maintaining a sustainable herring fishery also encourages consumption of local seafood.

The Commission does not anticipate any non-monetary benefits to worker safety as a result of the proposed regulation.

Consistency with State or Federal Regulations

The proposed regulations are neither inconsistent nor incompatible with existing state regulations. Section 20, Article IV, of the State Constitution specifies that the Legislature may delegate to the Fish and Game Commission such powers relating to the protection and propagation of fish and game as the Legislature sees fit. The Legislature has delegated to the Commission the power to regulate the commercial take of herring (sections 8550 and 8553, Fish and Game Code). The Commission has reviewed its own regulations and finds that the proposed regulations are neither inconsistent nor incompatible with existing state regulations. The Commission has searched the California Code of Regulations and finds no other state agency regulations pertaining to the commercial take of herring. There are no comparable federal regulations for the commercial harvest of herring.

REGULATORY LANGUAGE

Section 163, Title 14, CCR, is amended to read:

§ 163. Harvest of Herring.

. . . [No changes to subsections (a) through (f)]

(g) Quotas.
(1) Crescent City Area: The total take of herring in the Crescent City area for commercial purposes by use of gill net only shall not exceed 30 tons per season.
(2) Humboldt Bay: The total take of herring in Humboldt Bay for commercial purposes by use of gill net only shall not exceed 60 tons per season.
(3) Tomales Bay: The total take of herring for commercial purposes by use of gill net only shall not exceed 350 tons per season.
(4) San Francisco Bay: The total take of herring in San Francisco Bay for commercial purposes shall not exceed ~~2,500~~ [quota to be set between zero (0) and five percent of the preceding year's spawning biomass estimate] tons ~~for the~~ ~~2014-2015~~ per season. Tonnage shall be allocated on the following basis:
(A) Gill net permittees (including "CH" permittees): Tonnage shall be allocated to each fishing group (odd and even) in proportion to the number of permits that are assigned to each fishing group minus the number of permits in each platoon that are suspended for the entire season. Each gill net permittee (designated by the department in writing) participating in research sponsored by the department shall be assigned an individual quota equal to 0.5 percent of the season gill net quota per assigned platoon.

. . . [No changes to subsections (h) through (j)]

Note: Authority cited: Sections 1050, 5510, 8550, 8552.1, 8553 and 8555, Fish and Game Code. Reference: Sections 713, 1050, 7852.2, 8043, 8550, 8552, 8552.6, 8553, 8554, 8555, 8556, 8557 and 8559, Fish and Game Code.

REGULATORY LANGUAGE

Section 164, Title 14, CCR, is amended to read:

§164. Harvesting of Herring Eggs.

[No changes to subsections (a) through (f)]

(g) Permit conditions: Every person operating under a permit to harvest herring eggs shall:
(1) Forfeit his or her herring fishing privileges authorized pursuant to Section 163 of these regulations during the same season.
(2) In addition to any license fees required by the Fish and Game Code, pay a royalty of $500 per ton of herring eggs on kelp taken. (The royalty fee shall include the landing tax imposed pursuant to Article 7.5, (commencing with Section 8040) Chapter 1, Part 3, Division 6, of the Fish and Game Code, and the royalty fee required for the harvesting of kelp pursuant to Section 165, Title 14 CCR).
(3) Submit a Herring-Eggs-on-Kelp Monthly Landings and Royalty Report ~~(FG 143 HR (Rev. 2/14),~~ (DFW 143 HR (REV. 06/04/15), which is incorporated by reference herein (available at the department's License and Revenue Branch, Sacramento), with payment due to the department's License and Revenue Branch, Sacramento for each month of the season, within 60 days after the close of the month for which it is due.
(h) Permit applications. Each applicant for a herring eggs on kelp permit shall:
(1) Submit the completed application as specified in Section 705, Title 14, CCR, to the address listed on the application for the season to which the application applies. No person shall submit more than one application per season. Applications shall include a performance deposit as specified in subsection (i).
(2) Permit Renewal. Applications for renewal of all Herring-Eggs-on-Kelp permits shall be received by the department, or if mailed, postmarked, on or before ~~August 1~~ the first Friday of October each year. Late fees, late fee deadlines, and late renewal appeal provisions are specified in Fish and Game Code Section 7852.2.
(3) Have submitted all fees from prior seasons.

. . . [No changes to subsection (i)]

(j) Method of Take. Herring eggs may only be taken by harvesting giant kelp (*Macrocystis* sp.), with spawn (i.e., eggs) attached, which has been artificially suspended using the following two methods: rafts and/or lines, a technique commonly known as the “open pond” method. For the purpose of this Section, a raft is defined as a temporary, mobile structure with a metal, wood or plastic frame. The total surface area of each raft is not to exceed 2,500 square feet. Rafts used by a licensed herring eggs on kelp permittee, prior to the 1995-96 season, are exempt from these size specifications. Such rafts may not be modified to exceed 2,500 square feet total surface area. Any new raft built after the 1995-96 herring eggs on kelp season must meet the specified dimensions. A line is defined as a piece of line of no more than 1,200 feet in overall length that is suspended under a suitable permanent structure (e.g., pier or

dock), or between two permanent structures (e.g., piers or docks). Kelp lines shall have floats or cork over the entire length of line. Each end of the line must be attached to a permanent structure. Kelp lines suspended from a permanent structure (e.g., pier or dock) shall not be placed as to hinder navigation. If kelp lines are suspended under a permanent structure (e.g., pier or dock), or if a raft is tied up to a permanent structure (e.g., pier, dock or rock wall, natural stationary shoreline structures), the permittee shall obtain prior written approval from the appropriate owners or controlling agency (e.g., wharfinger, Coast Guard, Navy or private owner). Buoys are not permanent structures.

(1) Not more than two rafts and/or two lines may be used per permit. Two permits may be simultaneously fished on the same raft if each line on the raft is clearly identified with the permit number of the owner. Each raft shall have a light at each corner that may be seen for at least a distance of 100 yards. Each raft shall be further identified with the herring eggs on kelp permit number in 14-inch high, 2-inch wide black Roman alphabet letters and Arabic numerals painted on a white background permanently affixed to the raft. Lines shall be marked at the beginning and the end with a light that may be seen for at least a distance of 100 yards. Each line shall be further identified with the herring eggs on kelp permit number in 14-inch high, 2-inch wide black Roman alphabet letters and Arabic numerals painted on a white background, permanently affixed to the line.

(2) Not more than 10 sets of test kelp may be used per permit. Test kelp is defined as one stipe with blades, attached to a length of line for the purpose of testing for spawning activity. A set is defined as one length of line with test kelp attached. Each set must be attached to a permanent structure (e.g., pier, dock) and marked with the herring eggs on kelp permit number, in Roman alphabet letters and Arabic numerals at least 3 inches high, at a point above the waterline. No herring eggs on kelp shall be retained from test kelp sets for testing purposes that have not been weighed and recorded, pursuant to subsection 164(k).

(3) Rafts and/or lines may not be placed in any waters or areas otherwise closed or restricted to the use of herring gill nets operating pursuant to Section 163 of these regulations, except where written approval is granted by the owners or controlling agency (e.g., Navy, Coast Guard). Rafts and/or lines may be placed in Belvedere Cove or Richardson Bay, only if permittees tie their rafts and/or lines to a permanent structure (e.g., pier, dock or rock wall, natural stationary shoreline structures), and obtain prior written approval. Buoys are not permanent structures.

(4) The total amount of herring eggs on kelp that may be harvested by each permittee shall be based on the previous season's spawning population assessment of herring in San Francisco Bay, as determined by the department. This assessment is used to establish the overall herring fishing quotas pursuant to Section 163 of these regulations. Each herring eggs on kelp permittee is allocated a quota equal to approximately ~~0.79 percent~~ 1.0 percent of the quota.

(5) Each vessel operating under or assisting in fishing operations under a permit issued pursuant to these regulations shall have a current Fish and Wildlife commercial boat registration and be further identified with the permittee's herring eggs on kelp permit number in 14-inch high, 2-inch wide black Roman alphabet letters and Arabic numerals painted on a white background permanently affixed to each side of the vessel. If a herring eggs on kelp vessel is also used as an assist vessel in another permittee's fishing operation, it must be identified with the number of the permit it is assisting.

(6) The permittee shall notify the department's License and Revenue Branch, Sacramento in writing with the name and department registration number issued pursuant to Section 7881 of the Fish and Game Code of any vessel that will be used for harvesting, processing or transporting herring eggs under the authority of the permit. The permittee shall receive written approval from the department before using a vessel for harvesting, processing or transporting herring eggs.
(7) Permittee shall notify the department's Santa Rosa Marine Region office at the telephone number designated on the herring eggs on kelp permit within a 4-hour period prior to the suspension of kelp on a raft and/or lines and supply the following information:
(A) Where the kelp suspension will take place; and
(B) Where the permittee plans to fish the rafts and/or lines; and
(C) A local fax number or mailing address where confirmation of kelp suspension notification can be sent.

. . . [No changes to subsections (k) through (n)]

Note: Authority cited: Sections 1050, 5510, 8389, 8552.1, 8553 and 8555, Fish and Game Code. Reference: Sections 713, 1050, 7850, 7850.5, 7852.2, 7881, 8043, 8053, 8389, 8550, 8550.5, 8552.1, 8552.2, 8552.3, 8552.4, 8552.5, 8552.6, 8552.7, 8552.8, 8553, 8554, 8555 and 8556, Fish and Game Code.

DEPARTMENT OF FISH AND WILDLIFE

HERRING EGGS ON KELP MONTHLY LANDINGS AND ROYALTY REPORT

DFW 143 HR (REV. 06/04/15) Previously FG 143 HR

This report is required in accordance with the provisions established in Title 14, Section 164, California Code of Regulations, and Fish and Game Code, Section 8389. (**PLEASE READ THE INSTRUCTIONS ON THE REVERSE SIDE OF THIS FORM**)

FIRST NAME	M.I.	LAST NAME	GO ID#
MAILING ADDRESS			DAY TELEPHONE *(OPTIONAL)*
CITY	STATE	ZIP CODE	E-MAIL ADDRESS *(OPTIONAL)*

SECTION I		
REPORTING MONTH:	YEAR:	PERMIT#

SECTION II
Check if "NO" herring eggs were harvested during the month: ❑ (Note: This report **MUST** be returned to Department of Fish and Wildlife whether herrings eggs were harvested or not)

SECTION III			
	Pounds Harvested During Month	Royalty Rate Per lb.	Amount
LINE 1. Performance Deposit Credit (50% due with Herring-Eggs-On-Kelp Permit Application)	N/A	N/A	$
LINE 2. Credit Balance on file with Department as of _____. [DEC: The amount in this column is the total of LINES 1 AND 2. JAN-MARCH: Amount brought forward from LINE 4 (credit balance).]	N/A	N/A	$
LINE 3. Pounds Harvested, "Royalty" due:		**$.25**	$
LINE 4. Ending Balance. Money remains in your royalty account if the balance is "negative".			$

NOTE:

The Department will provide each permittee with their beginning balance of "Herring Eggs-on-Kelp" royalty monies on account as of December 1 of the current season. The "Ending Balance" (LINE 4) is to be carried forward to LINE 2, "Credit Balance on file with Department", on your next month's Royalty Report. The Department will then be able to reduce your existing credit balance in a systematic method. Please use ( ) for "negative" balances. A negative balance indicates the amount of money remaining in your account.

CERTIFICATION: I certify that all statements on this report are made in good faith, and all figures are to the best of my knowledge a true and correct report of herring eggs harvested.	
SIGNATURE **X**	**DATE:** *(month/day/year)*

DEPARTMENT OF FISH AND WILDLIFE
HERRING EGGS ON KELP MONTHLY LANDINGS AND ROYALTY REPORT
DFW 143 HR (REV. 06/04/15) Previously FG 143 HR

INSTRUCTIONS

GENERAL INFORMATION:
As of December 1, 1999 ALL permittees had a credit balance on account with the Department. Permittees are required to report their landings by month and either reduce their royalty balance by the amount due or remit the amount indicated on LINE 4 of the report.

If the balance on LINE 4 of the report is "positive" (no brackets), please submit check or money order in the amount indicated. The check should be made payable to "Department of Fish and Wildlife". DO NOT SEND CASH. Send the report and attached remittance to the address indicated below:

California Department of Fish and Wildlife
License and Revenue Branch
1740 N. Market Blvd.
Sacramento, CA 95834

This report must be submitted on a monthly basis, no later than 60 days after close of the month in which the herring eggs were harvested (Section 164(g)(1), Title 14 of the CCR). Failure to submit the report and remittance, if applicable, could result in legal and/or, administrative action against your company.

If you have any questions regarding this report, please contact Department's License and Revenue Branch at (916) 928-5822, or e-mail LRB@wildlife.ca.gov.

INSTRUCTIONS ON PREPARING THE REPORT:
SECTION I: Fill in the month and year for which the report is submitted and permit number.

SECTION II: Check if you did not harvest/receive any herring eggs on kelp during the month.

SECTION III:
LINE 1. This is the amount remaining of the current season's performance deposit (50% of quota) submitted with the Herring-Eggs-On-Kelp Permit Application on or before the first Friday of October each year. At the beginning of the season, this amount will be added to any credit balance from LINE 2.

LINE 2. The Department will fill in this line on your report. The amount in this column is the total of LINES 1 and 2. Each subsequent month, YOU are required to fill in the "month" and the "Amount" columns. The ending balance (LINE 4) of each previous month's report should be inserted in the "Amount" column (LINE 2). As a note, if your credit balance was depleted at the end of the previous month, the amount inserted on this line should be zero (0).

LINE 3. Report the "Pounds harvested during the month". Multiply the pounds by $.25 per pound and fill in the "Amount" column. Note: If herring eggs were harvested during the month, the "Amount" column will NEVER indicate a negative amount.

LINE 4. Subtract LINE 3 "Amount" column from LINE 2 "Amount" column.

EXAMPLE: If you have a ($1,000) balance indicated on LINE 2 under the column "Amount" and you harvested 1,000 pounds of roe on kelp during the month, you would:

Record 1,000 pounds on LINE 3 under the column identified as "Pounds harvested during the month". Then multiply 1,000 pounds by $.25. The result should be $250. Indicate $250 on LINE 3 under the column identified as "Amount". Subtract LINE 3 "Amount" column from LINE 2 "Amount" column. The result on LINE 4 should be a seven hundred and fifty dollar credit. Credit amounts are to be bracketed ($750). This ($750) credit will be recorded on LINE 2 of your next month's report.

California Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE

DEPARTMENT OF FISH AND WILDLIFE HERRING-EGGS-ON-KELP MONTHLY LANDINGS AND ROYALTY REPORT

This report is required in accordance with the provisions established in Title 14, Section 164, California Code of Regulations, and Fish and Game Code, Section 8389. (**PLEASE READ THE INSTRUCTIONS ON THE REVERSE SIDE OF THIS FORM**)

FIRST NAME	M.I.	LAST NAME		GO ID#
MAILING ADDRESS				DAY TELEPHONE *(VOLUNTARY)*
CITY		STATE	ZIP CODE	E-MAIL ADDRESS *(VOLUNTARY)*

SECTION I:

REPORTING MONTH:	YEAR:	PERMIT#

SECTION II:

Check if "NO" herring eggs were harvested during the month: ☐
(Note: This report **MUST** be returned to Department of Fish and Wildlife whether herrings eggs were harvested or not)

SECTION III:

	Pounds Harvested During Month	Royalty Rate Per lb.	Amount
LINE 1. Performance Deposit Credit (50% due with Herring-Eggs-On-Kelp Permit Application)	N/A	N/A	$
LINE 2. Credit Balance on file with Department as of _____. [DEC: The amount in this column is the total of LINES 1 AND 2. JAN-MARCH: Amount brought forward from LINE 4 (credit balance).]	N/A	N/A	$
LINE 3. Pounds Harvested, "Royalty" due:		**$.25**	$
LINE 4. Ending Balance. Money remains in your royalty account if the balance is "negative".			$

NOTE:
The Department will provide each permittee with their beginning balance of "Herring Eggs-on-Kelp" royalty monies on account as of December 1 of the current season. The "Ending Balance" (LINE 4) is to be carried forward to LINE 2, "Credit Balance on file with Department", on your next month's Royalty Report. The Department will then be able to reduce your existing credit balance in a systematic method. Please use ( ) for "negative" balances. A negative balance indicates the amount of money remaining in your account.

CERTIFICATION: I certify that all statements on this report are made in good faith, and all figures are to the best of my knowledge a true and correct report of herring eggs harvested.

SIGNATURE: X	DATE: *(month/day/year)*

INSTRUCTIONS FOR COMPLETING HERRING-EGGS-ON-KELP MONTHLY LANDINGS AND ROYALTY REPORT

GENERAL INFORMATION:
As of December 1, 1999 ALL permittees had a credit balance on account with the Department. Permittees are required to report their landings by month and either reduce their royalty balance by the amount due or remit the amount indicated on LINE 4 of the report.

If the balance on LINE 4 of the report is "positive" (no brackets), please submit check or money order in the amount indicated. The check should be made payable to "Department of Fish and Wildlife". DO NOT SEND CASH.
Send the report and attached remittance to the address indicated below:

California Department of Fish and Wildlife
License and Revenue Branch
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Sacramento, CA 95834

This report must be submitted on a monthly basis, no later than 60 days after close of the month in which the herring eggs were harvested (Section 164(g)(1), Title 14 of the CCR). Failure to submit the report and remittance, if applicable, could result in legal and/or, administrative action against your company.

If you have any questions regarding this report, please contact Department's License and Revenue Branch at (916) 928-5822, or e-mail LRB@wildlife.ca.gov.

INSTRUCTIONS ON PREPARING THE REPORT:
SECTION I: Fill in the month and year for which the report is submitted and permit number.

SECTION II: Check if you did not harvest/receive any herring eggs on kelp during the month.

SECTION III: LINE 1. This is the amount remaining of the current season's performance deposit (50% of quota) submitted with the Herring-Eggs-On-Kelp Permit Application on August 1st each year. At the beginning of the season, this amount will be added to any credit balance from LINE 2.

LINE 2. The Department will fill in this line on your report. The amount in this column is the total of LINES 1 and 2. Each subsequent month, YOU are required to fill in the "month" and the "Amount" columns. The ending balance (LINE 4) of each previous month's report should be inserted in the "Amount" column (LINE 2). As a note, if your credit balance was depleted at the end of the previous month, the amount inserted on this line should be zero (0).

LINE 3. Report the "Pounds harvested during the month". Multiply the pounds by $.25 per pound and fill in the "Amount" column. Note: If herring eggs were harvested during the month, the "Amount" column will NEVER indicate a negative amount.

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Record 1,000 pounds on LINE 3 under the column identified as "Pounds Harvested During the Month". Then multiply 1,000 pounds by $.25. The result should be $250. Indicate $250 on LINE 3 under the column identified as "Amount". Subtract LINE 3 "Amount" column from LINE 2 "Amount" column. The result on LINE 4 should be a seven hundred and fifty dollar credit. Credit amounts are to be bracketed ($750). This ($750) credit will be recorded on LINE 2 of your next month's report.

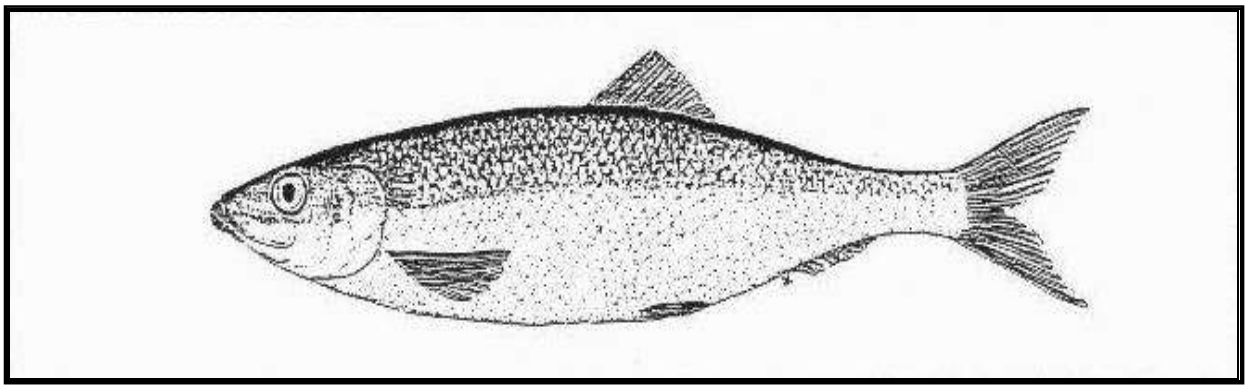
SCH No. 98052052

Final

SUPPLEMENTAL ENVIRONMENTAL DOCUMENT

PACIFIC HERRING
COMMERCIAL FISHING REGULATIONS

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



2015
STATE OF CALIFORNIA
THE NATURAL RESOURCES AGENCY
DEPARTMENT OF FISH AND WILDLIFE

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 review and analysis as required by the California Environmental Quality Act (CEQA) Guidelines (Section 15000 et seq., Title 14, California Code of Regulations [CCR]). This review and analysis will assist the California Fish and Game Commission (Commission) in regulating the commercial harvest of herring throughout the State's ocean and estuarine waters. Specifically, the FSED reviews and evaluates proposed regulatory changes for the 2015-16 fishing season, supplementing, and in some cases replacing, aspects of the proposed project described in the 1998 FED and the Final Supplemental Environmental Documents (FSED) of 1999, 2000, 2001, 2002, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2013, and 2014. A Notice of Preparation (NOP) notified and provided opportunity for the public, resource and regulatory agencies, and the fishing industry to offer input on the scope of the environmental document.

The FSED includes seven chapters. Chapter 1 discusses the authorities and responsibilities under which the FSED was developed and describes its intended use. Chapter 2 describes the proposed project and alternatives, as well as options for regulating the commercial harvest of herring. Chapter 3 describes the existing environment where the California Pacific herring (herring), *Clupea pallasii,* 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 and Chapter 7 responds to public comments regarding the proposed project.

The proposed project has been selected as the preferred alternative based on the analysis in 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 herring resource.

S.2 Proposed Project

The proposed project is a body of regulations governing the commercial harvest of herring for roe products, bait, as fresh fish, and the harvest of herring eggs on kelp. 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 project takes the form of recommendations for continuation, amendment, or change to an existing body of regulations in effect since October 13, 2014 (Sections 163, and 164, Title 14, CCR).

The proposed regulatory changes will establish season quotas for fishing operations in San Francisco Bay for the 2015-16 herring fishing season, based on the most recent assessments of the spawning population. The specific regulatory changes proposed for the 2015-16 season will provide the Commission a quota option range between zero (0) and five percent of the most recent San Francisco Bay, 2014-15, spawning biomass estimate. The Department of Fish and Wildlife's (Department) recommendation is a five percent harvest for the 2015-16 season in San Francisco Bay. Additionally in San Francisco Bay, the Department's recommendation is to increase the herring eggs on kelp (HEOK) quota allocation from 0.79 to 1.0 percent and change HEOK permit renewal dates to conform to gill net permit due dates. Previously established quotas for Tomales Bay, Humboldt Bay, and Crescent City area fisheries are not affected by these regulatory changes

S.3 Project Alternatives

Three alternatives to the proposed project are considered in this FSED. These alternatives include: (1) a no project alternative; (2) a no change alternative, which uses existing regulations; and (3) establishing individual vessel quotas for gill net vessels in the herring fishery. Refer to Section 2.4, Project Alternatives, 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 environment most likely to be affected by the regulatory revisions outlined in this FSED is San Francisco 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. Historically, herring fisheries have occurred in Tomales Bay, Humboldt Bay, and Crescent City area; however these fisheries are not currently active. 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 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

Three alternatives to the proposed project are considered. These alternatives have been examined as they apply to this FSED. 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.

S.5.2.1 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.

S.5.2.2 Alternative 2 (existing regulations)

In most regards, the environmental impacts associated with this alternative would be comparable to those of the proposed project. This alternative allows for adjustment of the season year, but 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 2014 and would not provide for consistent adaptive management of the State's resources.

S.5.2.3 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 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.

Misuse of the 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, 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 the 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, the 2007 FSED, the 2008 FSED, the 2009 FSED, the 2010 FSED, the 2011 FSED, the 2013 FSED, and the 2014 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 (herring), *Clupea pallasii,* in California. It was prepared by the Department of Fish and Wildlife (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 2015-16 herring commercial fishing season.

This FSED was prepared as a supplement to: (1) 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; (9) the FSED certified by the Commission in October 2007; (10) the FSED certified by the Commission in September 2008; (11) the FSED certified by the Commission in September 2009, (12) the FSED certified by the Commission in September 2010; (13) the FSED certified by the Commission in September 2011, (14) the FSED certified by the Commission in August 2013, and (15) the FSED certified by the Commission in August 2014. The FED outlines the full proposed project consisting of the operation and management of California's 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, 2007, 2008, 2009, 2010, 2011, 2013, and 2014 provide for revisions of the proposed project contained in the FED and regulatory revisions necessary for the 1999-2000, 2000-01, 2001-02, 2002-03, 2004-05, 2005-06, 2006-07, 2007-08, 2008-09, 2009-10, 2010-11, 2011-12,

2013-14, and 2014-15 herring commercial fishing seasons, respectively. Environmental documents (Draft Supplemental Environmental Document [DSED] and FSED) were not prepared in 2003 or 2012. This FSED supplements the existing certified environmental documents and provides revisions to the regulations for the 2015-16 herring commercial fishing season.

The Department and Commission hold the public trust for managing the State's fish and 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 Natural Resources. With certification, an agency may prepare functional equivalent environmental documents in lieu of EIRs or NDs.

The regulatory program of the Commission has been certified by the Secretary for Natural Resources. A functional equivalent, FED 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 draft supplemental document is given the same notice and public review given to a draft environmental document, and may be circulated by itself without the previous FED. When deciding whether to approve the proposed project, the lead agency considers the previous FED as revised by the supplemental environmental document (Section 15163, Title 14, CCR). A Notice of Preparation (NOP) for the DSED was circulated to interested parties on March 27, 2015. Following the release of the NOP, the 30-day public comment period pursuant to CEQA for the proposed project ended April 27, 2015. Pursuant to CEQA regulations, a 45-day public comment period for reviewing the DSED was held from May 8, 2015, to June 22, 2015.

This is the fifteenth 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; the eighth was certified by the Commission in October 2007; the ninth was certified by the Commission in September 2008; the tenth was certified by the Commission in September 2009; the eleventh was certified by the Commission in September 2010; the twelfth was certified by the Commission in September 2011; the thirteenth was certified by the Commission in August 2013; and the fourteenth was certified by the Commission in August 2014. As provided for by CEQA, the Department will continue to use this method of revising Sections 163 and 164, Title 14, CCR, until the Department prepares a new environmental document or a Fishery Management Plan (FMP).

1.3. Scoping Process

Pursuant to CEQA, the Department distributed, for the Commission, a NOP to interested parties on March 27, 2015. In addition, the Department received input on the proposed project at a Director's Herring Advisory Committee (DHAC) meeting held on

April 1, 2015, in Sausalito, County of Marin. 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. In addition, members of the public, interested organizations and herring fishing industry members were in attendance at the DHAC meeting to provide input.

Historically, during the scoping process, several issues have been raised including: the need for determining unfished biomass, developing a harvest control rule, developing a simulation model for herring management, accounting for herrings importance as a forage species, genetic comparisons of the Tomales Bay and San Francisco Bay populations, the cost of managing the fishery, simplifying existing gill-net regulations, amending herring eggs on kelp regulations, permit stacking and establishing a limited voluntary individual quota herring fishery. A FMP would address all of these issues. FMPs are prescribed for all marine fisheries pursuant to the Marine Life Management Act. FMPs typically 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. FMPs 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 increases 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 of 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. Until an FMP can be developed the 1998 FED and subsequent FSEDs will serve as the primary management tools for herring.

In the interim and to address some of the issues raised during the scoping period, the Department offers the following information. The Department is currently working with the Centre for Environment, Fisheries and Aquaculture Science (CEFAS) to develop a stock assessment model for herring. This model is a critical step in the development of an FMP and will help address many of the concerns regarding biological reference points and harvest control rules, as well as providing a valuable tool for managing the herring fishery. CEFAS is experienced in using stock assessments in the development of fisheries management plans and has completed a stock assessment model on the Atlantic herring (*Clupea harengus*). Preliminary modeling results were provided to the Department in November 2013, and September 2014.

After completing an internal review, the Department plans to subject the model to an independent peer review prior to using it for management decisions. In addition, the Department, in partnership with several conservation organizations and the commercial fishing industry, is currently working to identify funds for development and implementation of an FMP.

Regarding herring as forage, it has been identified as a key forage species in the California Current Ecosystem. However, due to the complexity of this system and biological interactions, it is difficult to quantify all predator/prey relationships or to quantify all oceanic conditions and factors that affect herring recruitment and persistence in the spawning population. As a result, the Department manages for herring's importance as a forage species by recommending conservative harvest percentages. Since 2010, as a conservation safeguard, the Department has recommended harvest percentages for herring at or below five percent of the most current spawning biomass estimate. This precautionary management approach has allowed, on average, more than 95 percent of the spawning stock (which represents only the portion of the total stock that leaves oceanic waters to spawn during a given season) to go unfished and remain available as forage or to meet other ecosystem functions, including stock rebuilding.

1.4. Report Availability

This FSED is available at the Commission office and Department Marine Region offices. It will also be posted on the Department's website at: http://www.dfg.ca.gov/marine/herring/.

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 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 delegates authority from the Legislature to the Commission, whose members are appointed by the Governor, to regulate the commercial harvest and possession of herring. The Department has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and habitat necessary for biologically sustainable populations of those species. The Department, as trustee for fish and wildlife resources, provides requisite biological expertise to the Commission on impacts arising from regulating the commercial harvest of herring (FGC Section 1802). The remaining FGC sections related 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 herring commercial fishing season. These meetings will be held for the 2015-16 season on August 4-5, 2015, in Fortuna, California, and on October 7-8, 2015, in Los Angeles, California. 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 FED certified by the Commission on August 28, 1998, is the regulation of herring fisheries under the State's jurisdiction. The regulations are considered for inclusion in the CCR to implement the State's policies for managing the commercial use of herring (Sections 163 and 164, Title 14, CCR). The proposed project and alternatives addressed in this 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, non-government organizations, commercial fishermen, and from the DHAC. The Commission has legislatively-delegated authority to act on these recommendations.

The project goal is to maintain healthy herring stocks in California. Objectives for achieving this goal include:

- Safeguard herring as an important forage species for all living resources of marine and estuarine ecosystems that utilize herring as a food source;
- Use precautionary principles in response to uncertainty when setting harvest targets;
- Manage the commercial harvest of herring to achieve a sustainable fishery;
- To the extent possible, maintain and/or restore healthy age structures to stocks;
- Avoid and/or minimize the harvest of two and three-year-old herring, many of which are first-time spawners;
- Set commercial harvest targets that conserve sufficient 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 (FGC Section 8550). Current regulations specify: permit qualifications, permit validation procedures and requirements, permit limitations, permit areas, vessel identification requirements, seasons, fishing quotas, gear restrictions, landing and monitoring requirements, permit categories and conditions, royalty fees, permit performance

deposit requirements, fishing and harvesting restrictions, processing requirements, and permit suspension conditions and procedures.

The proposed project addressed by this FSED consists of amendments and changes to existing regulations for the 2015-16 commercial herring fishing season. The proposed project would establish the season quotas for fishing operations in San Francisco Bay, would increase the herring eggs on kelp (HEOK) quota allocation from 0.79 to 1.0 percent, and make minor changes to permit due dates in the HEOK fishery. Quota recommendations for San Francisco Bay are primarily based on the most recent assessments by the Department of the estimated spawning population of herring in San Francisco Bay. The recommendation also takes into account additional data examined each season, including age structure, growth and general condition, predicted size of incoming year-classes (*i.e.*, recruitment), biological aspects of the catch, and ocean and bay conditions.

2.2. Project Locations

Permits are issued for commercial herring fishing in four geographically distinct areas of 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, seasons, proposed 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.

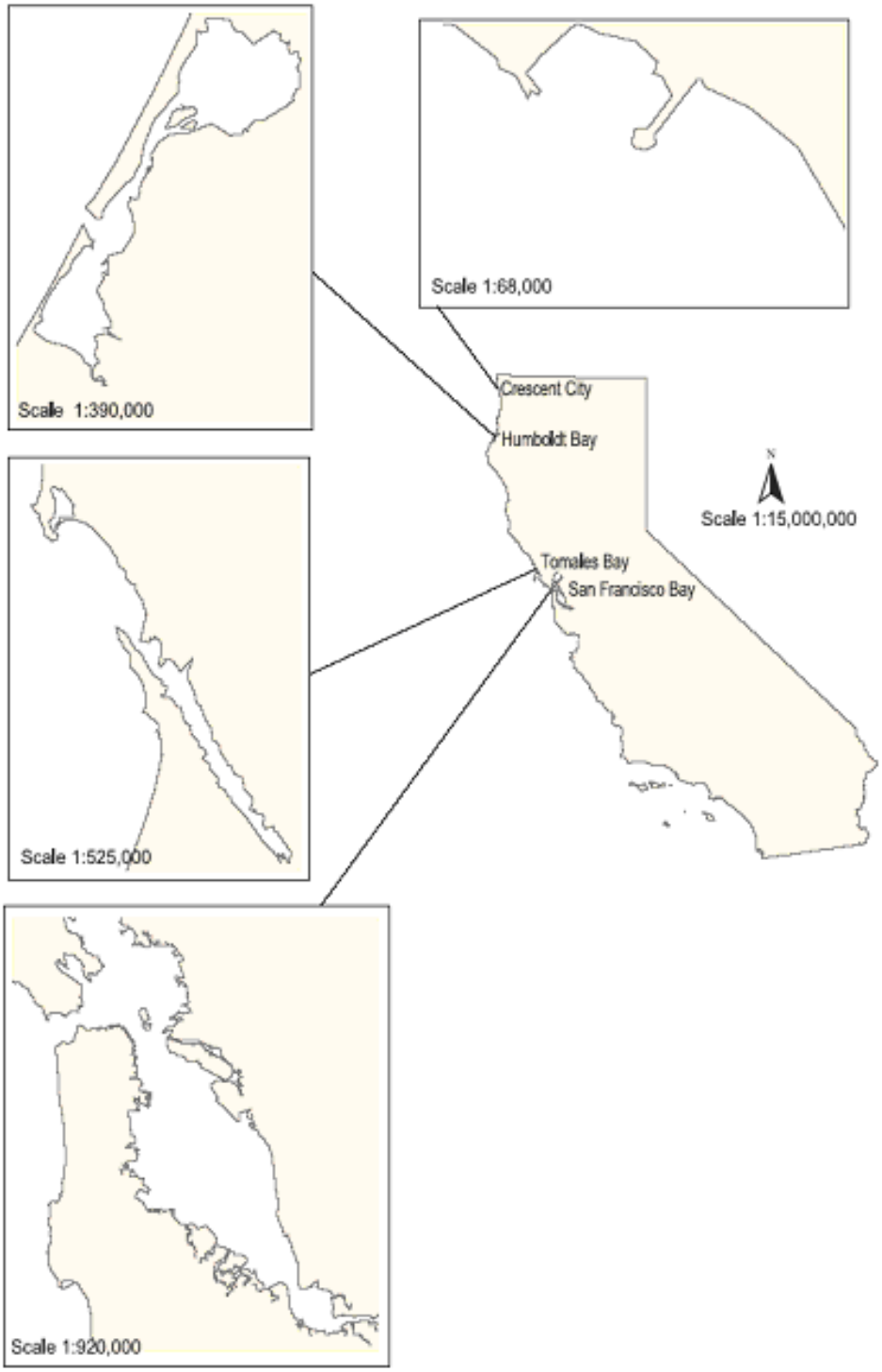

Figure 2.1 Locations of commercial Pacific herring fisheries.

2.2.1. San Francisco Bay

The proposed commercial herring fishing quotas for San Francisco Bay are as follows:

2.2.1.1. Herring Fishery

Season: 5:00pm on January 1, until noon on March 15. If January 1 falls on a Friday or Saturday, fishing shall commence on the first Sunday following that date at 5:00pm. If the closing date of the fishery falls on a Saturday or Sunday, fishing shall close on the Friday immediately preceding March 15 at noon.

Gill net permittees with odd numbered permits shall be permitted to fish first in odd numbered years and then alternating weeks with even numbered permits until the close of the season.

Gill net permittees with even numbered permits shall be permitted to fish first in even numbered years and then alternating weeks with odd numbered permits until the close of the season.

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

Quota: The proposed total take of herring in San Francisco Bay for commercial purposes shall be set between zero and five percent of the most current biomass estimate for San Francisco Bay. The total take of herring in San Francisco Bay for commercial purposes shall not exceed 834 tons for the 2015-2016 season. <u>For the 2015-16 season the Department recommends a conservative harvest option of 834 tons or five percent of the 16,674 ton 2014-15 spawning biomass estimate.</u> 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 catch and age composition analysis, and environmental data.

Note: The quota for the herring gill net fishery will be reduced by an allocation to the herring eggs on kelp fishery quota (See Section 2.2.1.2).

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 to March 31

Quota: The total amount of HEOK that may be harvested by each permittee shall be based on the previous season's spawning population assessment of herring in San Francisco Bay, as determined by the Department. This assessment is used to establish the overall herring fishing quota. Each HEOK permittee is currently allocated a quota equal to approximately 0.79 percent of the quota. <u>For the 2015-16 season, the Department recommends increasing the HEOK permittee allocation from 0.79 to 1.0 percent of the overall San Francisco Bay quota.</u>

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

Note: The area open to the HEOK 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).

2.2.2. Tomales Bay

There are no proposed changes to commercial herring fishing quotas for Tomales Bay.

2.2.3. Humboldt Bay

There are no proposed changes to commercial herring fishing quotas for Humboldt Bay:

2.2.4. Crescent City Area

There are no proposed changes to commercial herring fishing quotas for the Crescent City Area.

2.2.5. Open Ocean

As of January 1, 2010, all commercial fishing for herring in ocean waters is prohibited, except as specified in Section 163 (f)(1), Title 14, CCR. An incidental take of no more than 10 percent herring by weight of any landing composed primarily of other coastal pelagic fish species or market squid may be landed.

2.2.5.1. Open Waters Fishery (closed)

Area: Ocean waters are limited to the waters of Districts 6 (excluding the Crescent City area), 7, 10 (excluding Tomales Bay), 16, and 17.

2.3. Project Characteristics

The proposed project recommends continuation of the existing regulations as modified by changes discussed below for the San Francisco Bay fishery. 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 herring 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 spawning herring population in San Francisco Bay as part of its ongoing monitoring and management of the fishery. The Department also examines age structure, growth and general condition, biological aspects of the catch, and environmental conditions (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 2015-16 season included: (1) provide the Commission a quota option range between zero (0) and five percent of the most recent San Francisco Bay, 2014-15 spawning biomass estimate; (2) increase the HEOK

permittee allocation from 0.79 to 1.0 percent of the overall San Francisco Bay quota; and (3) adjust the permit renewal date for the HEOK fishery to align with the gill net fishery due date.

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 after the 2005-06 season. Spawning ground surveys in Humboldt Bay were conducted during the 1974-75, 1975-76, 1990-91, and 2000-01 through 2006-07 seasons. 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). A general herring survey was completed in Humboldt Bay in early 2015 to identify spawning waves, spawn areas, length frequency composition and to update herring fecundity data, this effort did not however provide a biomass estimate.

Since the 1973-74 herring season, the Department has conducted annual spawning biomass estimates for San Francisco Bay using spawn deposition surveys. From 1990 through 2003, the Department derived the spawning biomass estimate in San Francisco Bay from a combination of the spawn deposition and hydroacoustic surveys. Beginning with the 2003-04 season, the Department reverted to spawn deposition surveys as the primary assessment tool to estimate the spawning biomass. This decision was based on a California Sea Grant peer review of the management of the commercial fishery that indicated the spawn deposition survey method tended to provide a better estimate of herring biomass. Currently, the spawn deposition survey is used in conjunction with trawl surveys to determine age and population structure of herring schools entering San Francisco Bay. Spawning biomass estimates for San Francisco Bay from the 1979-80 through the 2014-15 seasons are shown in Figure 2.2. As a result of state-wide reduced fishing effort as well as reduced staffing and budget constraints; the Department is not able to conduct spawning biomass surveys in Tomales Bay, Humboldt Bay, or the Crescent City area. It should also be noted that no commercial fishery has taken place in Tomales Bay since 2007, since 2005 in Humboldt Bay, and since 2002 in Crescent City.

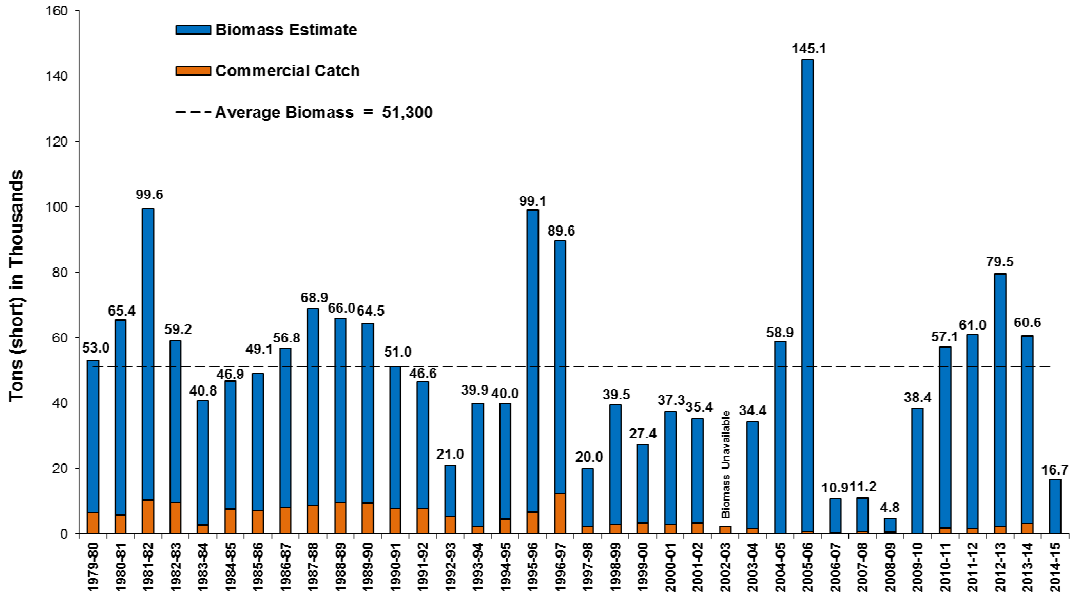

Figure 2.2 San Francisco Bay Pacific herring biomass estimates and commercial catch from the 1979-80 season to 2014-15 season.

Annual fishing quotas are intended to provide for a sustainable fishery and have historically been limited to a total catch not to exceed 20 percent (harvest percentage) of the previous season's estimated spawning biomass. This harvest percentage was selected, based upon model simulations, to help ensure adequate protection of the herring resource while taking into account accidental overages and other management uncertainties. This model, however, assumes stable environmental and biological conditions. In an attempt to account for potential season-to-season variability in these conditions, the Department has set even more conservative harvest percentages. In 2003, due to exploitation rate concerns, the Department requested a peer review of its fishery management activities. The Department worked with California Sea Grant to assemble a team of scientists with demonstrated expertise in modeling and fish population assessment. A key recommendation resulting from this peer review was that a harvest rate in the range of 10-15 percent would be sustainable and that a lower level would provide a desirable target for stock rebuilding (California Sea Grant Extension Program 2003). Based on this assessment, the Department has continued to recommend low harvest percentages to the Commission, and since the 2010-11

season, the Department has recommended quotas less than or equal to five percent of the previous season's estimated spawning biomass. Actual exploitation rates (catch percentages) by the commercial fishery have equaled an average of approximately four percent of the total spawning biomass since the 2003-04 season and have equaled an average of less than 10 percent of the spawning biomass since the 1979-80 season (Figure 2.2).

Quotas are the principal regulatory tool used to establish adequate protection of herring as an important forage species and to provide for the long-term yield of the commercial fishery. Each year, the Department recommends a harvest percentage that is not determined by a fixed mathematical formula; rather, the recommendation is based upon modeling results and takes into account additional data collected each season, such as ocean productivity and bay conditions, growth rates of herring, strength of individual year-classes, and predicted size of incoming year-classes (*i.e.*, recruitment). In response to poor recruitment, indication of population stress, and/or unfavorable oceanographic conditions, harvest percentages beginning in 2003 have been set at or below 10 percent. Since the 2003-04 season, harvest percentages on average have allowed over 90 percent of the spawning biomass to return to the ocean after spawning in the bay. The Department and DHAC recommended a no fishery option (zero ton quota) for the 2009-10 season, when the herring spawning biomass in 2008-09 fell to a new low of 4,833 tons. The Commission adopted this recommendation and the commercial fishery was closed in San Francisco Bay for the 2009-10 season. Since the re-opening of the fishery for the 2010-11 season, the Department has recommended harvest percentages at five percent or less of the spawning biomass. Based on accepted fishery management principles these harvest percentages are conservative and represent a precautionary approach to safeguard the population as forage and to provide a robust reproductive base to allow for stock rebuilding.

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.

2.3.1. Herring Fisheries

2.3.1.1. San Francisco Bay 2015-16 Quota

The spawning biomass estimate for the 2014-15 season was 16,674 tons, significantly below the historical average (1979-80 season to present) of 51,300 tons (Figure 2.2). This was also a substantial decrease in spawning biomass from the previous season's estimate of 60,600 tons, and is the fourth-lowest estimated biomass on record since the 1979-80 season. The population decline recorded during the 2014-15 season is likely attributable to poor oceanic and estuarine conditions which adversely affect herring survival as described in Chapter 3.3 of this FSED.

The Department is providing the Commission the option to consider a quota range between zero (0) and five percent of the 2014-15 spawning biomass estimate of 16,674 tons. The Department recommends a conservative quota option of 834 tons or five percent harvest rate for the 2015-16 season. Even with the lower than expected spawning biomass the Department does not consider a five percent harvest rate to be a risk to the sustainability of the fishery. The Department's recommendation would maintain fishing mortality at a comparatively low level, which will be beneficial for stock recovery. Additionally, a small fishery quota will ensure herring's role as an important forage species is protected while providing limited opportunity to the commercial fishery. This approach will help maintain a sustainable fishery while continuing to support herring's integral role in both ocean and bay ecosystems.

The Department considers that a conservative quota maintains sustainability while safeguarding sufficient numbers of herring for stock rebuilding. Additionally, fishing effort in the San Francisco Bay herring fishery has decreased significantly during the past several years. During the 1990s, the number of herring permits peaked at over 450 with over 120 vessels participating. In contrast, during the 2014-15 season there were only 171 herring permit renewals and only two vessels elected to participate in the gill net fishery.

From the total quota for San Francisco Bay, separate permit quotas are established for each gill net platoon (i.e., Odd and Even fishing groups). The overall quota is allocated among the platoons in proportion to the number of permits assigned to each platoon. Adjustments to quotas for each fishing platoon are calculated annually to offset permittee attrition and the use of herring permits in the 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 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. The Department is recommending increasing the allocation from 0.79 to 1.0 percent for the 2015-16 season. 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 Area 2015-16 Quotas

The quotas for Tomales Bay, Humboldt Bay, and Crescent City area are not to exceed 350 tons, 60 tons, and 30 tons, respectively. No changes are proposed for these fishing areas for the 2015-16 season. It should be noted that these areas have not been subjected to any fishing pressure for a number of seasons. No commercial fishing activity has taken place in Tomales Bay since 2007, in Humboldt Bay since 2005 and in the Crescent City area since 2002. For the 2014-15 season, Tomales Bay had nine permit renewals and Humboldt Bay and Crescent City had three renewals combined. Permit renewals have fallen over the past several years, reducing the fleet capacity in these areas. Poor market conditions and unique site constraints at each location further limit the viability of herring fisheries in the near term for these areas.

2.4. Project Alternatives

Three alternatives to the proposed project are considered and are 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). Under this alternative, the commercial

harvest of herring would be prohibited.

- Alternative 2. The existing regulation alternative would maintain the herring fishery regulations as amended through 2014.
- Alternative 3 (individual vessel quota for gill net vessels in herring 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 regulation alternative would maintain the herring fishery regulations as amended through 2014 and would not provide for adaptive management of the State's resources. The only amendment or change suggested allows for updating the season year.

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. However, there has never been a clear consensus of support 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

Herring 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). 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 herring spawning (Miller and Schmidtke 1956).

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.

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 estuary through summer, and then migrate out to sea. Research conducted on herring in Straits of Georgia, British Columbia (BC) suggests that 1- and 2-year old herring occupy inshore waters and older herring occupy shelf waters (Haegele 1997). In BC waters, juvenile herring were found in shallow nearshore waters of less than 50 meters during the summer, in shoals of similar-sized individuals. Based on the life history data of 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 herring fisheries occur during the spawning season. The herring gill net fisheries catch herring as they move into the shallows to spawn. The traditional product from this fishery, *kazunoko*, is the sac roe (eggs) removed from the females, which is processed and exported for sale in Japan. California's roe herring fisheries have historically occurred in the Crescent City area, Humboldt Bay, Tomales Bay, and San Francisco Bay.

The San Francisco Bay HEOK 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 herring fishery in California has been intensively regulated since its inception in 1973, at first by the California State Legislature, then by the Commission. 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 FED, which includes herring life history, ecology, status of stocks and fisheries at that time, and biological and environmental descriptions of herring fishery locations (Crescent City area, Humboldt Bay, Tomales Bay, San Francisco Bay, and Monterey Bay).

3.2. Spawning Population Estimation Methods

During the 1973-74 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 and through an independent peer review conducted by California Sea Grant (California Sea Grant Extension Program 2003). 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 spawning biomass estimates, the Department collects fishery independent age composition data from the population and 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 Spawning Population

The spawning biomass estimate for the 2014-15 season was 16,674 tons. This estimate represents a decrease of 43,926 tons from the 2013-14 season estimate of 60,600 tons (Figure 2.2). The reduction in the spawning biomass is likely due to unfavorable environmental and biological conditions in the California Current Ecosystem during the summer and fall of 2014.

Variability in several oceanographic processes can affect coastal and nearshore productivity, and in turn the spawning population of herring in the San Francisco Bay. Coastal upwelling has been shown to affect recruitment in estuarine populations of forage fish including herring (Reum et al. 2011). During coastal upwelling deep, cold, nutrient-rich water is brought to the surface nearshore by Ekman transport resulting from predominantly north winds during spring and summer along the coast of California. The presence of this nutrient-laden water results in increased plankton which fuels production in coastal pelagic ecosystems (Rykaczewski and Checkley 2008). However, large-scale oceanographic processes in the Pacific Ocean such as the El Nino Southern Oscillation (ENSO) cycle and the Pacific Decadal Oscillation (PDO) can affect the strength of upwelling and the nutrient content of surface water, in turn affecting nearshore marine ecosystems (Chavez et al. 2002, Checkley and Barth 2009). The ENSO cycle, which is measured using various indices including the Multivariate ENSO Index (MEI), is the major mode of climate variability in the equatorial Pacific and can have strong impacts throughout the Pacific Basin and the California Current Ecosystem

(CCE). Positive MEI values are associated with El Nino conditions. The PDO reflects periodic changes in North Pacific sea surface temperature that occur at a longer temporal scale than the ENSO cycle. PDO values fluctuate between positive values, which indicate warmer, less productive conditions, and negative values, which indicate cooler, more productive conditions in the North Pacific.

Climate data reported in early 2015 indicate that multiple oceanographic processes in combination have resulted in unfavorable biological conditions in the CCE during the period of time herring spend feeding in the Pacific ocean (National Marine Fisheries Service 2015). Following a year of strong coastal upwelling in 2013, upwelling indices showed a return to average and below-average upwelling in 2014. Although MEI shows ENSO-neutral conditions as of December 2014, the PDO switched to a strongly positive (warm) phase, a reversal from the relatively high-productivity, cool regime that had dominated the region from mid-2010 through the end of 2013. Record-high sea surface temperatures that dominated the Gulf of Alaska spread south into the northern and central CCE during the fall of 2014. These conditions contributed to an overall reduction in productivity in the NE Pacific in the fall of 2014, which was reflected in a sharp decline of the lipid-rich, northern copepod species that are of high nutritional value to pelagic fish species. This overall reduced productivity in the NE Pacific, and CCE specifically, was likely a major contributing factor to the reduction in spawning herring biomass observed by the Department during the 2014-15 spawning season in San Francisco Bay.

Twelve spawning events were recorded during the 2014-15 season, primarily in the northern areas of San Francisco Bay and along the San Francisco waterfront (Table 3.1). Spawning events occurred as far north as Point San Pablo and south to Coyote Point (Figure 3.1). The first recorded spawn of the season occurred October 19-20, 2014, and the last recorded spawn occurred from February 25-March 1, 2015. There were several spawning events in Richardson Bay and smaller events to the east along the Marin county shore. The largest spawn event of the season was at Point Richmond with 6,716 tons of herring recorded. The second largest was the Richardson Bay to Point Diablo spawn with 3,947 tons, followed by the San Francisco waterfront spawn, estimated at 3,458 tons.

Table 3.1 2014-15 San Francisco Bay Pacific herring spawning biomass estimate by event with commercial catch totals.

#	Approximate Spawn/Catch Date	Location	Submerged Areas	Shore Areas	Spawn Total	Gill-Net	HEOK	Biomass Total
1	October 19-20, 2014	Richardson Bay	*Trace*					*Trace*
2	November 25-26, 2014	Richardson Bay	375		375			375
3	December 12-14, 2014	Richardson Bay	18		18			18
4	December 20-23, 2014	Richardson Bay	499	11	509			509
5	December 27-30, 2014	San Francisco Waterfront		3,458	3,458			3,458
6	January 3-4, 2015	Coyote Point		166	166			166
7	January 5-8, 2015	Richardson Bay	1,016		1,016			1,016
8	January 10-13, 2015	Paradise Cove-Belvedere Cove	163	197	360			360
9	January 19-21, 2015	Richardson Bay-Point Diablo	1,596	2,312	3,909	38.0		3,947
10	January 29-February 1, 2015	Point Richmond-Point San Pablo	4,206	2,502	6,708	7.6		6,716
11	February 1-2, 2015	Tiburon (Keil Cove-Belvedere Cove)	23	58	81			81
12	February 25-March 1, 2015	Richardson Bay	30		30			30
Spawn Events (n) = 12		**Totals in short tons**	**7,925**	**8,703**	**16,628**	**46**	**0**	**16,674**

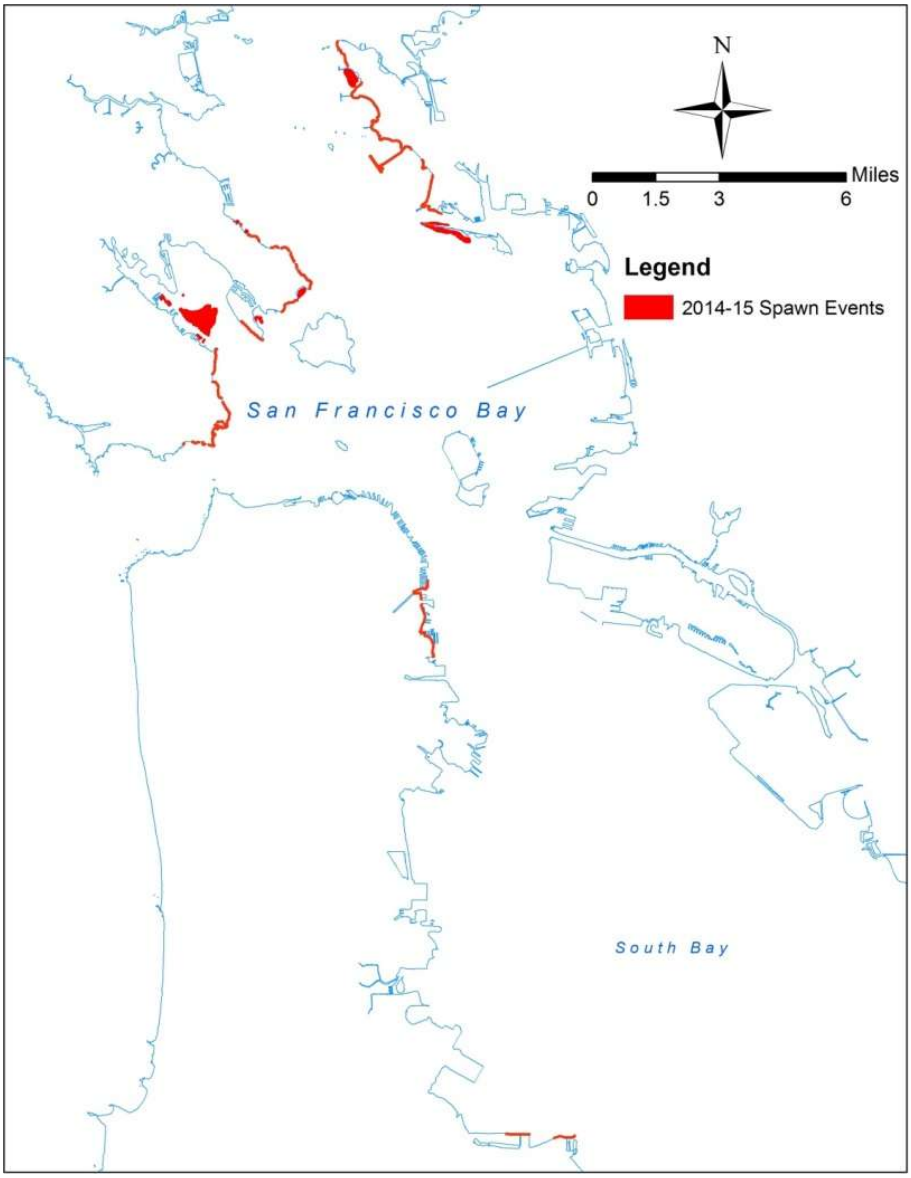

Figure 3.1 San Francisco Bay Pacific herring 2014-15 season spawn event map.

The Department uses the spawning stock biomass and age class structure to assess the spawning population and determine an appropriate harvest level from the available stock. Herring were captured with research nets to estimate the age class structure of the San Francisco Bay spawning population this season. Preliminary ages are assigned using a length-age key. Final age is determined from a surface reading of the otoliths (ear bones) of herring. Data are compiled into age classes (groups of fish the same age) for analysis. The age class composition is used to assess the cohorts

(year classes) of herring born in a given season which compose the spawning population.

Spawning population age composition for 2014-15 shows that individual year class biomass declined from the previous season for all age classes, except age 7 – year old herring (Figure 3.2). The spawning biomass of age 2- and 3-year old herring was the lowest since the 2008-09 season. Reduced numbers of young fish negatively affect recruitment to the San Francisco Bay fishery and they are typically the largest cohorts in the spawning population. The proportion of age 6 and older herring increased between 2013-14 and 2014-15; with age 7-year old herring collected in both research and commercial samples for the first time since 1998-99 (Figures 3.3 and 3.4). This is important as the commercial fishery is supported by a greater proportion of older fish from the spawning population. Increased biomass of older age classes may reduce the burden on younger cohorts to support the fishery. Maintaining a healthy age class structure, including a proportion of older age classes is a management goal of the Department.

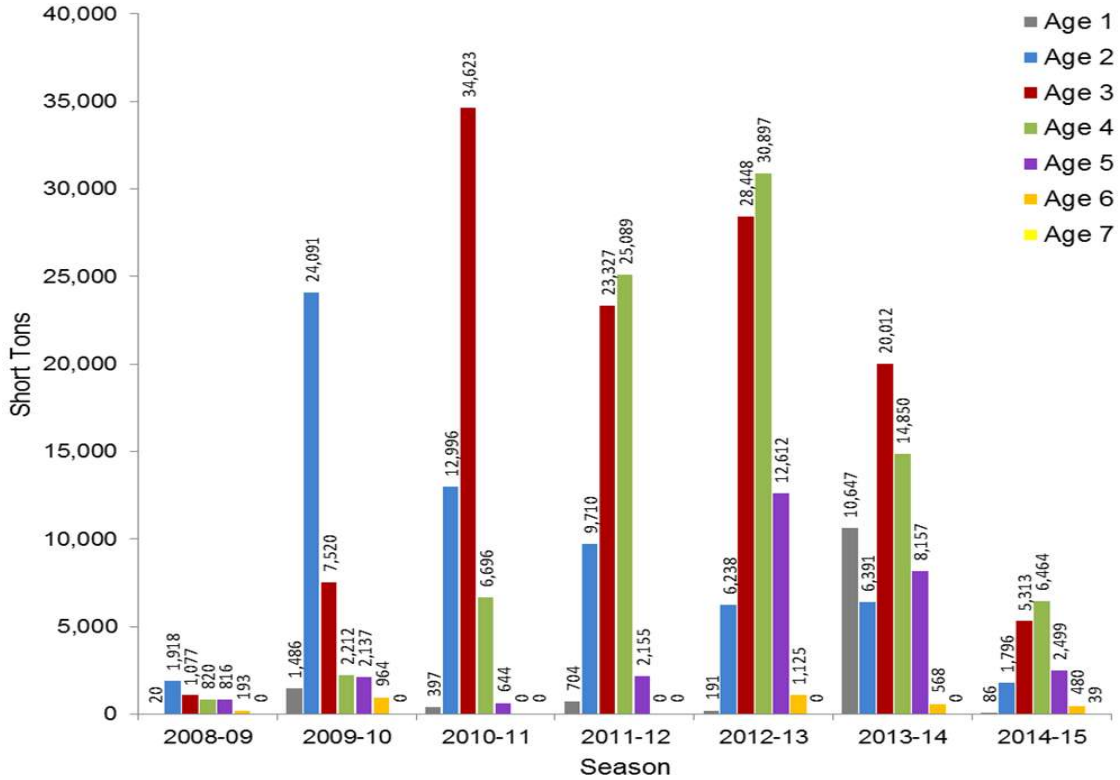

Figure 3.2 San Francisco Bay spawning biomass by age class for the 2008-09 to 2014-15 seasons based on research catch.

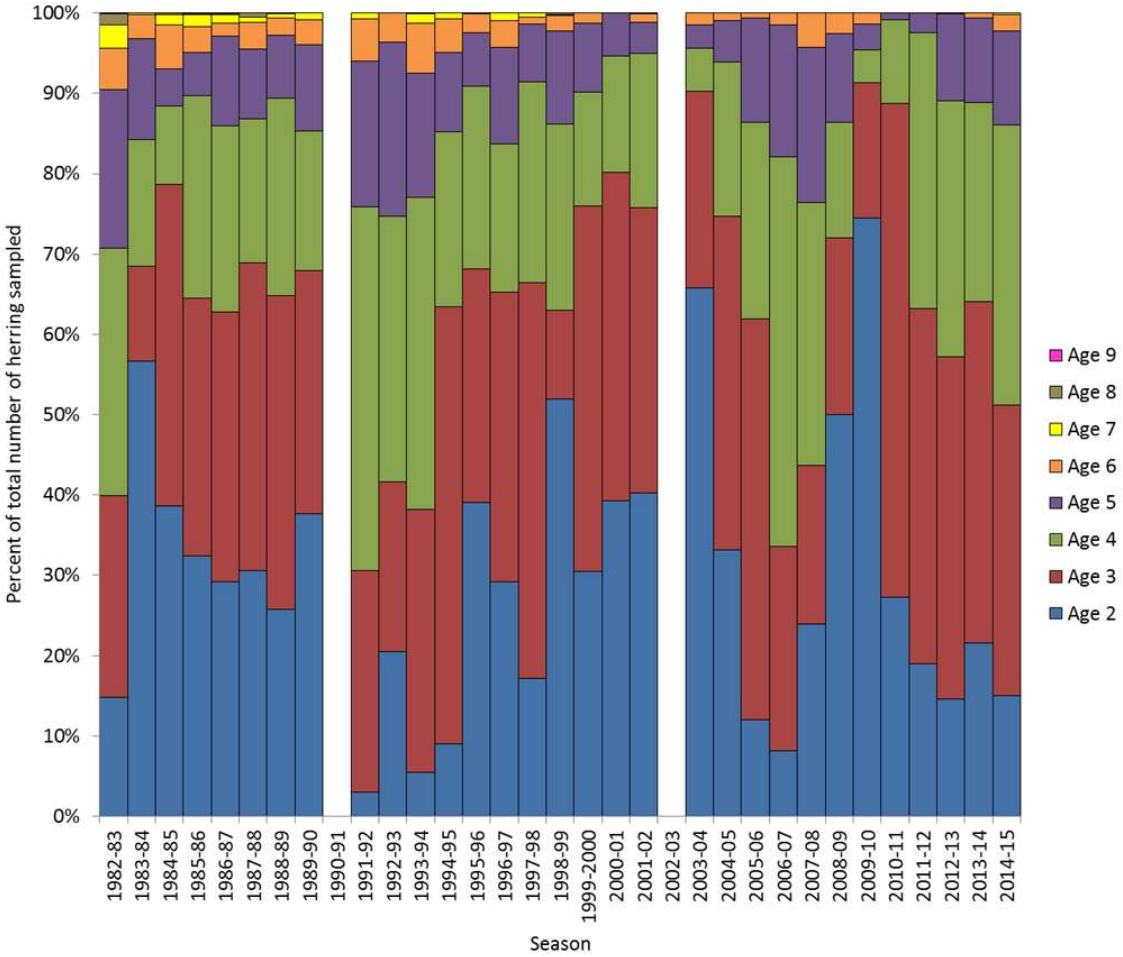

Figure 3.3 Age composition of the research catch (excluding age-1 fish) by number of ripe fish for the San Francisco Bay Pacific herring spawning biomass. Note: Data unavailable for the 1990-91 and 2002-03 seasons.

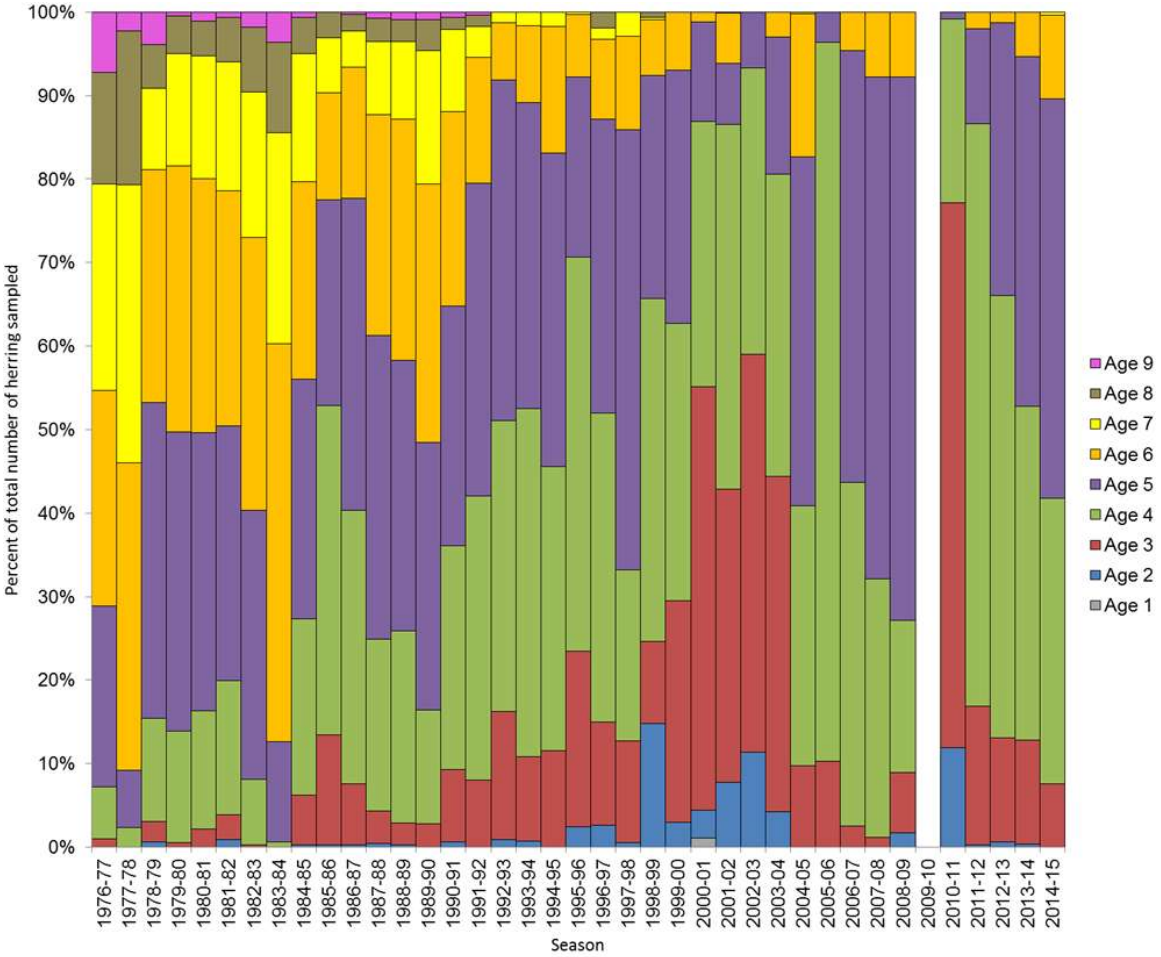

Figure 3.4 Age composition of the commercial gill net catch. Percent by number of fish for the San Francisco Bay Pacific herring fishery. Note: The fishery was closed during the 2009-10 season.

The length-weight relationships for herring in spawning condition are used to develop a condition factor index (CI), which is derived from a fish's weight divided by the cube of its length, and used to describe the general health of a population. The mean CI for mature 2014-15 San Francisco Bay herring was above average, showing a slightly improved condition relative to the 2013-14 season (Figure 3.5).

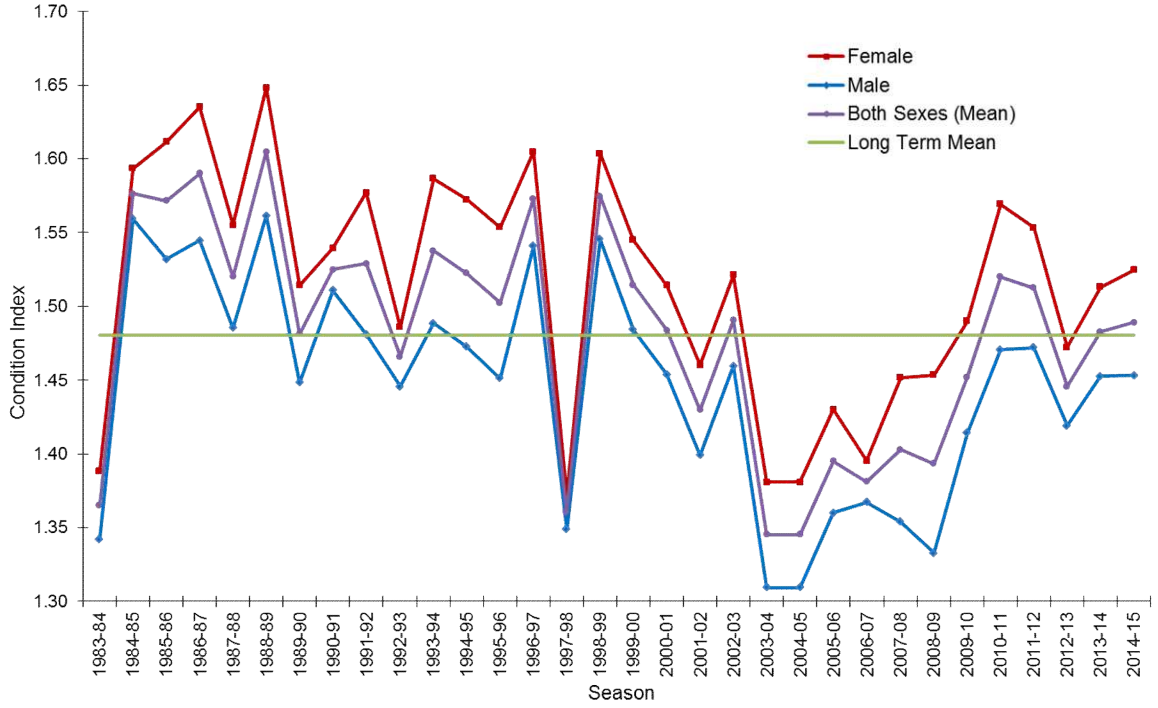

Figure 3.5 Average Condition Index (CI) and historical mean CI for ripe male and female fish from the Department's San Francisco Bay Pacific herring research catch.

In summary, the spawning biomass estimate for the 2014-15 season was 16,674 tons, well below the historical average (1979-80 season to present) of 51,300 tons. This spawning biomass estimate represents a substantial decrease from the previous season's estimate of 60,600 tons, and is the fourth-lowest estimate on record since the 1979-80 season. Spawning population age composition for 2014-15 shows that individual year class biomass declined from the previous season for all age classes, except age 7 herring. The decline recorded during the 2014-15 season is likely attributable to poor oceanic and estuarine conditions which adversely affect herring. Despite the observed reduction in spawning biomass, the Department considers precautionary harvest percentages (at or below five percent) of the previous season's spawning biomass as the primary means of assuring a sustainable fishery even in years of unfavorable ecological conditions. Continued monitoring of both the herring spawning population and commercial catch will ensure that the Department's management goals are achieved and younger fish are not harvested at unsustainable

levels. These management measures help to maintain herring's importance as a key forage species in the California Current Ecosystem.

3.3.1. San Francisco Bay Herring Young of the Year

Herring young-of-the-year (YOY) are collected by 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 San Francisco estuary from the western Sacramento-San Joaquin Delta to San Francisco Bay. Stations are sampled each month using a midwater trawl that is towed obliquely through the water column to capture species inhabiting varying depths. The catch from this net is used to calculate an index of abundance for YOY herring (Fleming 1999).

The herring YOY abundance index for 2014 was below average for the period of record (Figure 3.6). The abundance of YOY indicated less favorable environmental conditions for survival than the prior year within the San Francisco estuary (Hieb and Giannetta in preparation). However, recruitment to the spawning stock is affected by a number of factors during the first two to three years of life, including predation, food availability, competition, and environmental conditions. Drought conditions and related increases in salinity in the San Francisco estuary result in a variety of potential impacts on YOY herring, some negative (Jassby et al. 2003, Kimmerer 2002, Orsi 1999) and others positive (Gilbert et al. 2014).

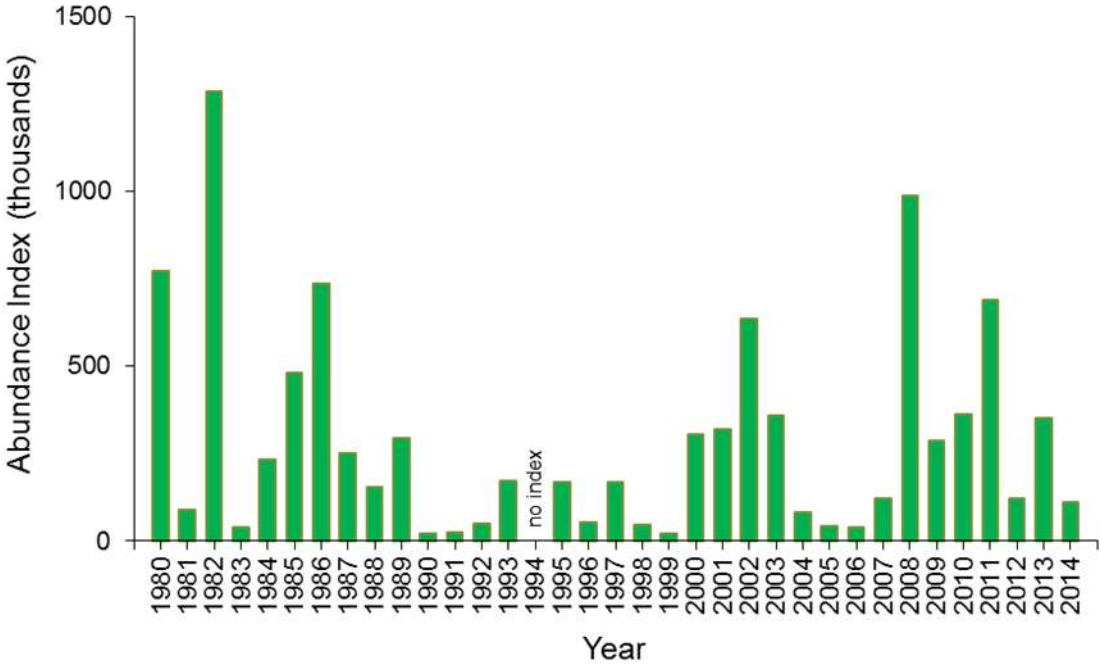

Figure 3.6 San Francisco Bay Pacific herring young-of-the-year abundance indices 1980-2014. Note: No index was calculated for 1994.

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 developmental 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 herring from the *Exxon Valdez* oil spill found four to six percent of the spawn occurred within visibly oiled areas. However, elevated concentrations of biologically available oil were 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 differing chemical properties, potential oil related impacts on herring are probably similar.

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. The findings of the NRDA report assist in determining the immediate and long-term impacts to herring resources and direct management activities for San Francisco Bay herring (Cosco Busan Oil Spill Trustees 2012). Field observations by Department staff indicated that key spawning areas were oiled during the spill and impacts of oil exposure on herring may negatively affect year class strength. Herring have evolved reproductive strategies to withstand predation, environmental uncertainties, and stochastic events. The population appears to be recovering and the Department will continue to monitor the population and adapt its management strategies as appropriate.

3.3.3. Importance of Herring as a Forage Species

As described in Chapter 3, Section 3.2.1.8.1 of the FED, herring are an integral component to a healthy functioning marine ecosystem, making up a large portion of the diet of marine organisms from California to Alaska. Herring are a mid-trophic level species that play an important role linking the lower and higher trophic levels in the food web. Changes in abundance and age structure of a forage species such as herring, as well as variability in the size and timing of herring spawn events, can lead to changes in the abundances and behaviors of the variety of organisms that depend on herring and their eggs for food, including important recreational and commercial species as well as threatened and endangered fish, marine mammals, and sea birds. The Commission has adopted a policy that recognizes the importance of forage species to the marine

ecosystem off California's coast and intends to provide adequate protection for forage species through precautionary and informed management. It is the goal of the Department to provide the Commission with management recommendations for herring that take into account their role as an important forage species and are based on the best available science.

3.4. Status of the Humboldt Bay Population

No spawning biomass estimates have been conducted in Humboldt Bay since 2007. However, the herring population was surveyed in the 2014-15 season to achieve the following objectives: 1) identify spawn timing, 2) map spawning areas, and 3) update length, age, and fecundity information. These data were collected as part of a collaborative effort between the Department and the commercial fishing industry to explore the potential for collecting essential fisheries information. Collaboration with key partners is a potentially useful tool to provide information in areas where the Department lacks the resources to assess herring populations. Information from this study will form the basis for future biomass estimates and will also serve to inform the future development of a Fishery Management Plan that will include San Francisco Bay, Tomales Bay, Humboldt Bay, and the Crescent City area.

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 FED. The proposed project and two of the three alternatives will permit a continuation of the regulated commercial harvest of herring in California. An analysis of the impacts of the proposed project is discussed in this FSED.

Existing regulations permit the commercial harvest of herring in four geographical areas: San Francisco Bay, Tomales Bay, Humboldt Bay, and the Crescent City area. 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 four geographical areas and were not considered in the impact analysis. Potential impacts relative to the above categories are 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 ten 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 spawning population estimates 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 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 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 FED. Three commercial harvest alternatives were selected for consideration by the Commission based on the Department's recommendation, public comment received during the normal review process, or in response to the 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 herring 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 herring and potentially reduce standing stocks 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 2014, were for the 2014-15 herring commercial fishing season. These regulations reflect the amendments as adopted by the Commission in August 2014. Under Alternative 2, the herring fishery regulations as

amended through 2014 would remain in place for the 2015-16 season. Under this alternative, existing regulations would be modified only by updating the season year. The environmental impacts of Alternative 2 would be similar to those of the proposed project, though there is potential to harvest herring above the recommended 2015-16 season quota. As a result Alternative 2 would not provide for consistent adaptive management of the State's resources.

5.3. Alternative 3 (individual vessel quota)

This alternative modifies proposed regulations by establishing individual boat quotas for the 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, typically, overall quotas have been met or fishing effort ceases 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 6 of the FED explains the role that consultation with other agencies, professionals, and the public plays in the Department's marine resource management programs. Department staff involved in herring resource management are in contact with other agencies, biologists, and researchers involved in herring management on an ongoing basis. The U.S. Fish and Wildlife Service, NOAA-Fisheries Service, U.S. Environmental Protection Agency, and other state and federal agencies have received all environmental documents that have been prepared regarding herring. To date, the Department has not received comments from these agencies.

Prior to preparation of this FSED, the Department initiated a broader consultation by distributing a NOP that announced the intent to prepare the DSED dated March 27, 2015. 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, herring permittees, 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.

Consultations occurred 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 2015-16 season to the DHAC, as well as interested organizations and individuals on April 1, 2015, in Sausalito, County of Marin.

Proposed changes to the regulations for the 2015-16 season will be modified, as necessary, based on comments from the public, other interested parties and DHAC. These recommendations will be presented to the Commission at their August 4-5, and October 7-8 2015, meetings.

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 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 June 22, 2015, to the Commission office in Sacramento.

7.1. Summary of Comments Received

One written comment was received by the Commission office from Mr. Huey Johnson in a letter dated April 24, 2015.

7.2. Department Responses to Comments

Comment 1

There needs to be a moratorium on herring fishery instead of a document to allow herring fishing. That is no herring fishing. The recent concern about forage fish rages. We face an empty sea and leaving herring along with some other forage fish as a food source is the only logical thing to do.

Response

It is the goal of the Department to provide the Commission with management recommendations for herring that take into account their role as an important forage species and are based on the best available science. The Department agrees that Pacific herring are an important forage species in the California Current Marine Ecosystem. That is why the Department is recommending a quota range of zero to five percent of the previous season spawning biomass. This conservative quota (harvest target) will help maintain a sustainable fishery and ensure herring's role as a critical forage species is maintained.

7.3. Copy of Written Comments Received

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Innovations for a Sustainable Future

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Department of Fish and Wildlife
Marine Region
619 Second St.
Eureka CA 95501

Friday April 24, 2015

Attention of Kirsten Ramey

Dear Kirsten Ramey:

I respond to your notice of preparation of a draft supplemental environmental document for commercial herring Fishing in Ocean waters.

There needs to be a moratorium on herring fishery instead of a document to allow herring fishing. That is no herring fishing.

The recent concern about forage fish rages. We face an empty sea and leaving herring along with some other forage fish as a food source is the only logical thing to do.

Sincerely

Huey D. Johnson

187 East Blithedale Avenue, Mill Valley CA 94941 p 415-928-3774 f 415-373-6978 RRI.ORG

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REFERENCES AND LITERATURE CITED

California Department of Fish and Game. 1998. Final Environmental Document (FED), Pacific Herring Commercial Fishing Regulations (Sections 163, 163.5, and 164, Title 14, California Code of Regulations). *Edited by* State of California. The Natural Resources Agency.

California Department of Fish and Game. 1999. Final Supplemental Environmental Document, Pacific Herring Commercial Fishing Regulations (Sections 163, 163.5, and 164, Title 14, California Code of Regulations). *Edited by* State of California. The Natural Resources Agency.

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APPENDIX A

S.1 Summary of Changes

This appendix provides a summary of the changes made to the DSED based on 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 Final Supplemental Environmental Document (FSED), where applicable.
- Misspellings, grammatical errors, and graph labels were updated or corrected.

Table of Contents

- The Table of Contents was updated to match any page numbers that changed during the process of finalizing the FSED document.
- Chapter 7 Responses to Comments Regarding the Proposed Project was added.
- Appendix A and A.1 Summary of Changes was added.

Summary

- The following text was changed in S.1 Introduction, paragraph 2 to show the number of chapters in the FSED: The FSED includes seven chapters.
  The following text was added to S.1 Introduction, paragraph 2: Chapter 7 responds to public comments regarding the proposed project.

Chapter 2. Project Description

- Minor editorial changes were made to improve clarity.
- The following bullet point was revised in section 2.1, Project Objectives, to clarify the use of precaution: Use precautionary principles in response to uncertainty when setting harvest targets.
- The following sentences were revised in section 2.3.1.1, San Francisco Bay 2015-16 Quota, to reflect correct biomass data, paragraph 1: The spawning biomass estimate for the 2014-15 season was 16,674 tons, significantly below the historical average (1979-80 season to present) of 51,300 tons (Figure 2.2). This was also a substantial decrease in spawning biomass from the previous season's estimate of 60,600 tons, and is the fourth-lowest estimated biomass on record since the 1979-80 season. The population decline recorded during the 2014-15 season is likely attributable to poor oceanic and estuarine conditions which adversely affect herring survival as described in Chapter 3.3 of this FSED.
- The following sentences were revised in section 2.3.1.1, paragraph 2, to clarify Department recommendations: The Department recommends a conservative quota option of 834 tons or five percent harvest rate for the 2015-16 season. Even with the lower than expected spawning biomass the Department does not consider a five percent harvest rate to be a risk to the sustainability of the fishery. The Department's recommendation would maintain fishing mortality at a comparatively low level, which will be beneficial for stock recovery. Additionally, allowing a small fishery quota will ensure herring's role as an important forage

species is protected while providing a limited opportunity to the commercial fishery.

- The following sentence in section 2.3.1.1, paragraph 3, regarding preliminary age data was removed and data are summarized in Chapter 3.3: Preliminary age composition analysis, based on length frequencies for the 2014-15 season indicates that age 4- and 5-year old herring continued to persist in the population (Figure 3.2). This is important to a healthy age-class structure; for this reason, one of the Department's longstanding management objectives has been to reduce the harvest of 2- and 3-year old herring, many of which are first-time spawners.

Chapter 3. Environmental Setting

- Minor editorial changes were made to improve clarity.
- The following sentence was revised to improve clarity in 3.3 Status of the San Francisco Bay Spawning Population, paragraph 2: However, large-scale oceanographic processes in the Pacific Ocean such as the El Nino Southern Oscillation (ENSO) cycle and the Pacific Decadal Oscillation (PDO) can affect the strength of upwelling and the nutrient content of surface water, in turn affecting nearshore marine ecosystems (Chavez et al. 2002, Checkley and Barth 2009).
- The following sentence in 3.3, paragraph 2, was deleted for clarity: Strong El Nino conditions result in upwelled water that tends to be warmer and more nutrient-poor than water that is upwelled during ENSO-neutral and La Nina conditions.
- In section 3.3, paragraph 4 was revised for clarity: Twelve spawning events were recorded during the 2014-15 season, primarily in the northern areas of San Francisco Bay and along the San Francisco waterfront (Table 3.1). Spawning events occurred as far north as Point San Pablo and south to Coyote Point (Figure 3.1). The first recorded spawn of the season occurred October 19-20, 2014, and the last recorded spawn occurred from February 25-March 1, 2015. There were several spawning events in Richardson Bay and smaller events to the east along the Marin county shore. The largest spawn event of the season was at Point Richmond with 6,716 tons of herring recorded. The second largest was the Richardson Bay to Point Diablo spawn with 3,947 tons, followed by the San Francisco waterfront spawn, estimated at 3,458 tons.
- In section 3.3, paragraph 6 was revised for clarity and to reflect completed age composition data: Spawning population age composition for 2014-15 shows that individual year class biomass declined from the previous season for all age classes, except age 7 –year old herring (Figure 3.2). The spawning biomass of age 2- and 3-year old herring was the lowest since the 2008-09 season. Reduced numbers of young fish negatively affect recruitment to the San Francisco Bay fishery and they are typically the largest cohorts in the spawning population. The proportion of age 6 and older herring increased between 2013-14 and 2014-15; with age 7-year old herring collected in both research and commercial samples for the first time since 1998-99 (Figures 3.3 and 3.4). This is important as the commercial fishery is supported by a greater proportion of

older fish from the spawning population. Increased biomass of older age classes may reduce the burden on younger cohorts to support the fishery. Maintaining a healthy age class structure, including a proportion of older age classes is a management goal of the Department

- The preliminary age data found in Figure 3.2 of the DSED was updated using final age data.
- The preliminary age data found in Figure 3.3 of the DSED was updated using final age data.
- In section 3.3, paragraph 8 was revised for clarity and to reflect completed age composition data: In summary, the spawning biomass estimate for the 2014-15 season was 16,674 tons, well below the historical average (1979-80 season to present) of 51,300 tons. This spawning biomass estimate represents a substantial decrease from the previous season's estimate of 60,600 tons, and is the fourth-lowest estimate on record since the 1979-80 season. Spawning population age composition for 2014-15 shows that individual year class biomass declined from the previous season for all age classes, except age 7 herring. The decline recorded during the 2014-15 season is likely attributable to poor oceanic and estuarine conditions which adversely affect herring. Despite the observed reduction in spawning biomass, the Department considers precautionary harvest percentages (at or below five percent) of the previous season's spawning biomass as the primary means of assuring a sustainable fishery even in years of unfavorable ecological conditions. Continued monitoring of both the herring spawning population and commercial catch will ensure that the Department's management goals are achieved and younger fish are not harvested at unsustainable levels.
- The following sentences were revised Section 3.3.1 San Francisco Bay Herring Young of the Year (YOY), paragraph 2 to reflect updated YOY data: The herring YOY abundance index for 2014 was below average for the period of record (Figure 3.6). The abundance of YOY indicated less favorable environmental conditions for survival than the prior year within the San Francisco Estuary (Hieb and Giannetta in preparation).
- The Abundance Index data found in Figure 3.6 of the DSED was updated using the completed 2014 YOY index.

<u>Chapter 4. Environmental Impact Analysis and Cumulative Effects</u>

- Minor editorial changes were made to improve clarity

<u>Chapter 6. Consultation</u>

- The last sentence was revised in paragraph 4 to reflect the October Fish and Game Commission meeting for consultation of interested parties: These recommendations will be presented to the Commission at their August 4-5, and October 7-8 2015, meetings.

<u>Chapter 7. Response to Comments</u>

- This chapter was added to the FSED.
- One comment and responses have been included.

References and Literature Cited

- The following reference was added: California Department of Fish and Wildlife. 2014. Final Supplemental Environmental Document (FSED), Pacific Herring Commercial Fishing Regulations (Sections 163, 163.5, and 164, Title 14, California Code of Regulations). *Edited by* State of California. The Natural Resources Agency.
- The following reference was updated to reflect a new author: Hieb, K., and Giannetta, J., in preparation. Fishes Annual Status and Trends Report for the San Francisco Estuary.

Appendix A

- This section was added to the FSED

State of California
Department of Fish and Wildlife

Memorandum

Date: August 31, 2015

To: Sonke Mastrup
Executive Director
Fish and Game Commission

From: Craig Shuman
Regional Manager, Marine Region

Subject: **Agenda Item for the October 7, 2015 Fish and Game Commission Meeting, Proposed Amendments to Sections 163 and 164, Title 14, California Code of Regulations, Harvest of Herring and Harvest of Herring Eggs**

To date the Department of Fish and Wildlife (Department) has received no comments in opposition to the proposed amendments to regulations for the harvest of herring and herring eggs, Sections 163 and 164, Title 14, California Code of Regulations. Additionally, no changes have been made to the proposed regulatory text in the Initial Statement of Reasons (ISOR).

As described in the ISOR and 2015 Final Supplemental Environmental Document for Pacific herring, the Department is providing the following recommendations to the Fish and Game Commission for consideration at the October meeting:

- San Francisco Bay quota option of zero to five percent of the previous season's (2014-15) herring spawning biomass. Five percent of 16,674 tons is recommended (834 ton quota) for the 2015-16 commercial herring season.

- Increase the Herring-Eggs-On-Kelp (HEOK) fishery quota allocation from 0.79 to 1.0 percent. The quota will be allocated as a proportion of the overall quota set each season for San Francisco Bay.

- Adjust the permit renewal date for the HEOK fishery to align with the gill net fishery due date. This would move the current due date for HEOK permits from August 1 each year to, "on or before the first Friday of October each year".

Should you have further questions or need additional information, please contact Dr. Craig Shuman, Regional Manager of the Department's Marine Region at (805) 568-0216. The public notice for this rulemaking should identify Environmental Scientist, Ryan Bartling as the Department's point of contact. Mr. Bartling can be reached at (707) 576-2877 or Ryan.Bartling@wildlife.ca.gov.

Attachments
ISOR Amend Sections 163 and 164
Final Supplemental Document for Pacific Herring

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Proposed Regulation Changes 2015-16 Pacific Herring Commercial Fishery

Fish and Game Commission Meeting
Los Angeles - October 7, 2015

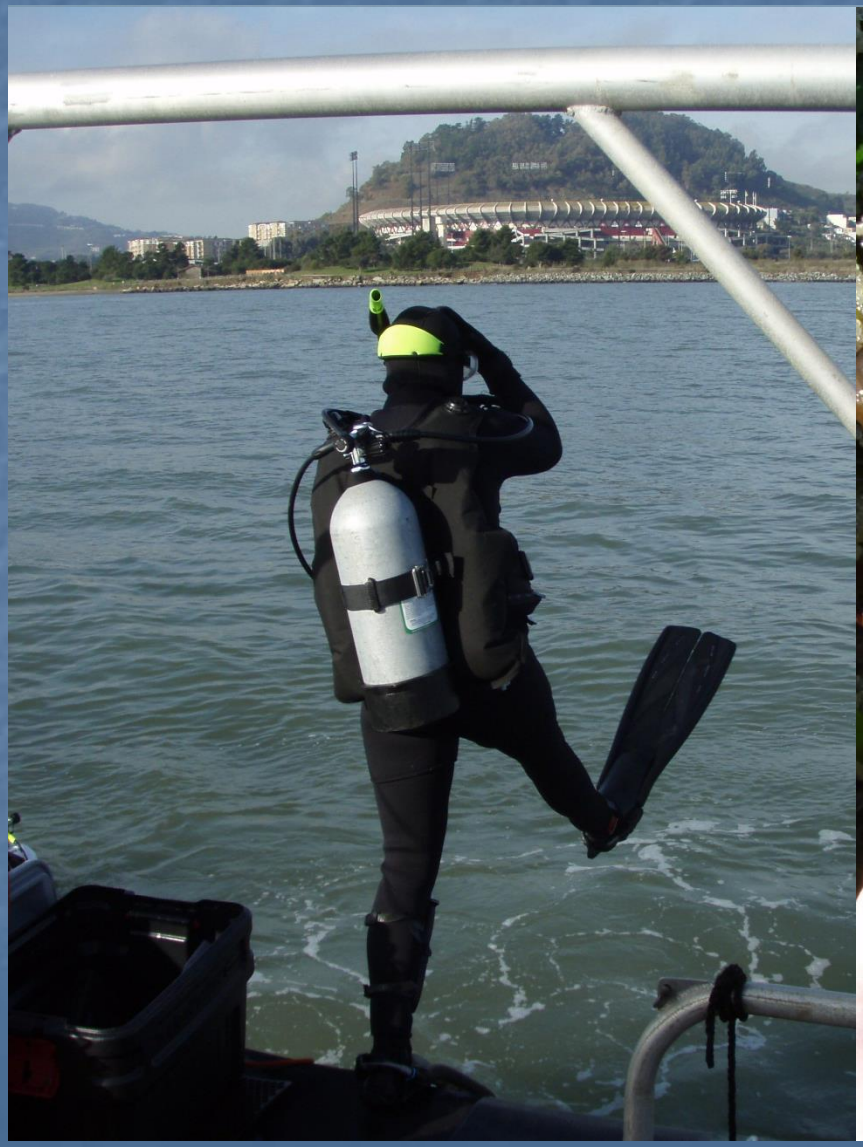
Presented by:
Ryan Bartling
Department of Fish and Wildlife
Marine Region

Overview

- Herring management summary
- Commercial herring fishery and spawning population status
- Proposed amendments 163 & 164, Title 14 CCR

Herring Management

Herring Management



Commercial Herring Fishery
2014-15 Summary

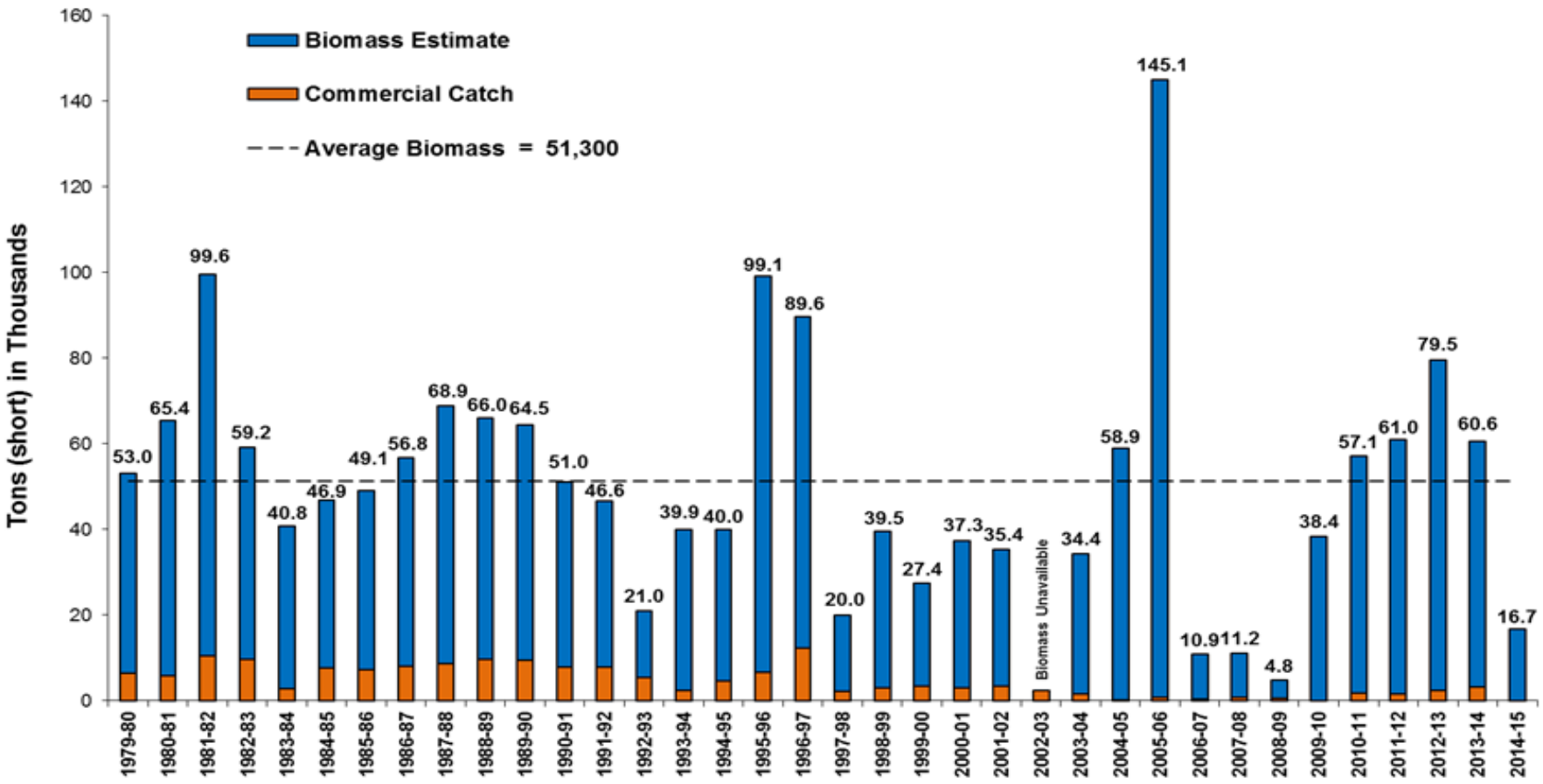
- San Francisco fleet caught 46 tons of 2,500 ton quota
- Herring eggs on kelp (HEOK) made no landings
- Tomales Bay, Humboldt Bay and Crescent City fisheries- inactive

Herring Population Status
San Francisco Bay

- 2014-15 biomass estimate = 16,700 tons
- Previous season biomass = 60,600 tons
- Decrease - low ocean productivity associated with high sea surface temps
- Continued recruitment of older age classes

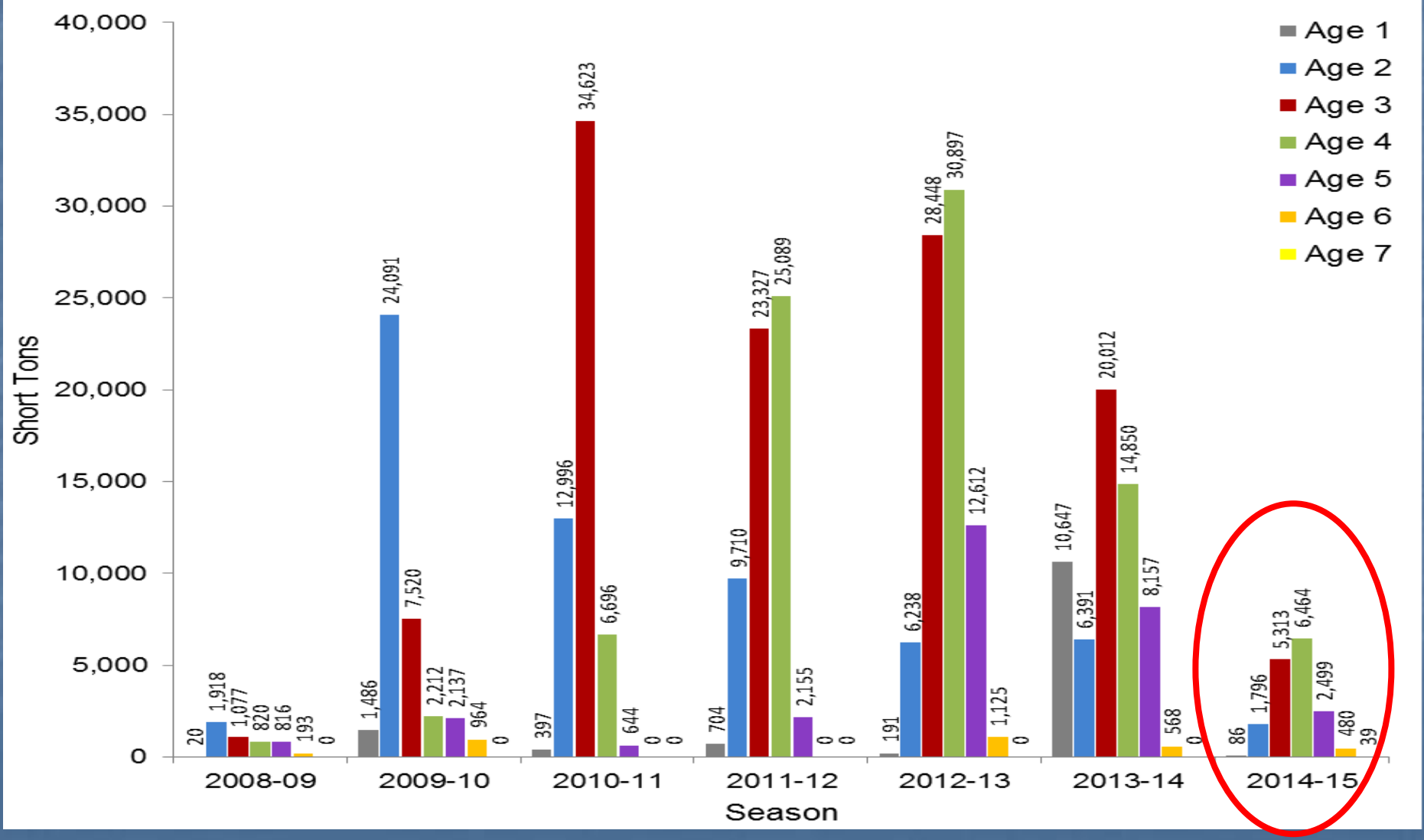
Status of the Herring Population

SF Bay Spawning Biomass 1979-2015



Status of the Herring Population

SF Bay Herring Age Class Summary 2008-2015



Proposed Regulations
2015-16 Commercial Fishery

- Set San Francisco Bay quota between 0 and 5% of the 2014-15 spawning biomass

  (recommend 5% = 834 tons)

- Increase HEOK quota allocation from 0.79% to 1.0% of the overall quota

- Minor form change for the HEOK fishery and amend permit due date

Summary

Population Status and Commercial Fishery

- Low commercial fishery activity
- SF Bay biomass = 16,700 tons
- Significant decrease in spawning biomass
- Low harvest targets ~ forage reserve

Proposed Regulations

- Set SF Bay quota between 0 and 5%
  - 5% recommended = 834 tons
- Increase HEOK allocation from 0.79% to 1.0%
- Minor HEOK form and permit due date changes

More Information:

CDFW Herring Web Page
dfg.ca.gov/marine/herring

Herring "Blog"
cdfwherring.wordpress.com

Thank you

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