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Tom Barnes
Program Manager, State Managed Marine Species
California Department of Fish and Wildlife
3883 Ruffin Road
San Diego, CA 92123

Sonke Mastrup
Executive Director, Fish and Game Commission
1416 9th St., Suite 1320
Sacramento, CA 95814

Dear Mr. Barnes and Mr. Mastrup,

We the undersigned organizations thank you for the opportunity to comment on the 2013-2014 Draft Supplemental Environmental Document (DSED) for commercial herring fishing in California. We understand this document supplements the Revised Final Environmental Document (FED) certified by the California Fish and Game Commission (Commission) in August 1998, as well as the Supplemental Environmental Documents certified by the Commission between August 1999 and August 2011.

We commend the Department of Fish and Wildlife (Department) for making substantial progress toward improved stewardship of Pacific herring by proposing a program for the 2013-2014 season which reflects the Commission and Department's intent of prioritizing herring management reform in 2013 and 2014,¹ and that is responsive to many recommendations previously submitted by our organizations.^{2,3} The proposed program moves the Department toward its overall goal of "optimal management of the Pacific herring resource for its ecological value and human use,"⁴ and reflects some of the goals of the Commission's new policy on the management of forage species.⁵ The policy states that the Commission intends to provide adequate protection for forage species through management goals that:

- Are precautionary and utilize the best available science in management decisions using clear and transparent methods;
- Identify and progressively incorporate Essential Fishery Information (EFI) needed for ecosystem-based management of forage species, including physical factors, oceanographic conditions, the effects of fishing on forage species' dependent predators, the availability of alternative prey, spatio-temporal foraging hotspots for predators, and existing management, including marine protected areas;
- Prevent the development of new or expanded forage fisheries until EFI is available and applied to ensure the sustainability of target forage species and protection of its benefits as prey; and
- Facilitate consistency in the management of forage species, integrate with existing Fishery Management Plans, and encourage cooperation and collaboration across jurisdictions and international boundaries in managing forage species.

Recommended key management objectives for management of Pacific herring in California

We have previously recommended and continue to support the following key management objectives for the Department to consider, among others, in order to fulfill the goals of the forage policy:

- Develop a harvest control rule for Pacific herring that explicitly incorporates Essential Fishery Information including the physical factors, oceanographic conditions, the effects of fishing on dependent predators, the availability of alternative prey, spatiotemporal foraging hotspots, estimated unfished biomass, and other management.
- Establish clear, quantitative recovery and sustainability benchmarks for age structure, biomass and geographic extent of spawning.
- Summarize known effects of alternative mesh sizes and gear configurations, for consideration of regulations to better accommodate participants in the fresh fish fishery, and to assess the possibility that such management changes may help address class truncation in the San Francisco Bay stock and recover the population to specified target levels.
- Describe and implement a regulatory option to establish permanent closure of commercial fisheries in unassessed areas, until a stock assessment is completed in these areas.
- Describe and implement a regulatory option for modifying fish sale and gear type regulations to better accommodate participants in the fresh fish market.

- Link Department and Commission herring management to other agencies' goals and activities for protecting and enhancing herring spawning habitat.

For the 2013-2014 season, it is our firm position that until an explicit harvest control rule is established and other key management objectives are achieved, the commercial fishery quota should be set at no greater than 4.7% of 2012-2013 estimated spawning biomass, which is the harvest rate that has been in place since 2009. This position is based on the importance of Pacific herring as forage, uncertainties about stock status, lack of a harvest control rule, and the objectives of the Commission's forage policy. We commend the Department and the DHAC for recommending this harvest rate for the 2013-2014 season, in light of these considerations.

Progress on meeting recommended management objectives through the DSED

A. Harvest control rule

We are pleased to see the DSED contains important new language acknowledging the importance of herring as a forage species, and, explicit acknowledgement of the management objective of conserving herring for forage:

...the Department manages for herring's importance as a forage species by recommending a conservative harvest. (pg 1-6)... Objectives for (maintaining healthy herring stocks in California include: a) safeguard herring as an important forage species for all living resources of marine and estuarine ecosystems; b) use precautionary principles when setting harvest targets (pg. 2-1)....The (Department's quota recommendation) will also help maintain a sustainable fishery while continuing to ensure herring's integral role in both ocean and bay ecosystems." (pg 3-12)

These statements support the objective of developing a robust harvest control rule. The DSED also includes information on the status of the stock assessment model currently under development to evaluate alternative harvest control rules, which the Department is developing through its collaboration with the Centre for Environment, Fisheries and Aquaculture Science (CEFAS).

We suggest the FSED include an estimated timeline for release and peer review of the model, and state explicitly how this model will be used to develop a harvest control rule and reference points. We also suggest the FSED recognize and include substantial Essential Fishery Information on Pacific herring that is currently available to support a harvest control rule, such as information on energetics of marine wildlife that is highly relevant to the stock assessment model and a harvest control rule. The DSED states that:

"Regarding herring as forage, due to the complexity of the ocean system and biological interactions, insufficient information is currently available to quantify all predator/prey relationships or to quantify all oceanic conditions and factors that affect herring survival."

However, there is a substantial and growing body of information on the energetic needs of predators for prey, both in general and specifically for herring or herring roe, some of which we

have included in earlier comment letters.³ This information should be included in the FSED. For example:

- The population of ~2043 humpback whales in California and Oregon requires approximately 817 tons per day of food. In southeast Alaska, humpback whales have been shown to feed preferentially on herring. A population of less than 150 whales consumed between 2600-7400 tons of herring in one spawning season.⁶
- The population of ~4000 Steller's sea lion in California requires approximately 7 tons of food per day. In Alaska, this endangered species feeds preferentially on herring.⁷
- In British Columbia, total annual consumption of herring by 13 predators averaged 61,000 tons/year from 1973-2008.⁸
- The common murre population between Cape Blanco and Pt. Conception, numbering about 1.5 million individuals, requires 170,000 tons of prey/year.⁹
- The Pacific population of surf scoter, numbering about 61,000 individuals, if feeding exclusively on herring roe would require just over 31,000 kg roe/day.¹⁰

While a fisheries management plan should ultimately be the optimal vehicle for long-term management of herring, Department and Commission staff have committed that significant progress can be achieved toward a harvest control rule through the annual rulemaking process. The important changes to 2013-2014 management relative to previous years, as described in this DSED, are illustrative of the suitability of the annual rulemaking process to improve herring management. We therefore suggest that the FSED explicitly state that the Department will continue to utilize the annual rulemaking process to achieve the Department's management objectives for the fishery as it works towards completing a Pacific herring FMP.

B. Harvest quota freeze pending a harvest control rule and progress on other management objectives

For the 2013-14 season the Department recommends a conservative harvest option of 3,737 tons or 4.7 percent of the 79,500 ton 2012-13 spawning biomass estimate. We strongly support this freeze in harvest rate in light of the absence of a justification for modifying the harvest rate higher or lower. Any such adjustment should be based on the results of a harvest control rule and achieving the management objectives outlined regarding incorporation of EFI.

C. Describe and implement a regulatory option to close commercial fisheries in unassessed areas including Tomales Bay, Humboldt Bay and Crescent City Harbor, until a stock assessment is completed in these areas.

The DSED recommends that quotas for Tomales Bay, Humboldt Bay, and Crescent City Harbor:

"...are not to exceed 350 tons, 60 tons and 30 tons, respectively." In previous correspondences^{2,3} a subset of our groups asked the Fish and Game Commission to close commercial fisheries in Tomales Bay, Humboldt Bay and Crescent City Harbor pending stock assessments. These areas were last assessed in the 2005-2006 spawning season. For Tomales Bay, the 1993-2006 average spawning biomass was 3,712 tons. The 350 ton harvest quota would be 10% of this average biomass; however, given the known fluctuations in herring abundance, this could represent a

much higher harvest rate in years of low abundance. Without a stock assessment, fishery managers have no means to assess whether these stocks are at low abundance. For Humboldt Bay, from 1994 to 2006, average biomass averaged just under 400 tons, and the last estimate was seven tons in 2006. Due to this alarming drop, the 60 ton harvest quota ceiling proposed in the DSED would be just over eight times the total biomass from 2006. This would also represent 15% of average biomass since 1974. For Crescent City, there is no information in the Department's environmental documents on any stock assessments having taken place, thus no justification for the 30 ton harvest quota. Furthermore, fisheries have not taken place in these areas for at least the last five years, so closures would have no substantive effects on local stakeholders. Therefore, any new fishing in these areas should be considered "new or expanded."

The DSED provides the Commission with a range of quota options for these areas, rather than a recommended quota for these areas. We commend the Department for including an option in the DSED to establish a quota of zero in these areas, and request that the Commission close these areas by setting quotas of zero until new stock assessments occur in these areas. Specifically, we also request the FSED recommend a 0 ton quota for all of these areas, reflecting the lack of stock assessment.

Streamline the sale of fresh fish to local markets

Our previous correspondence recommended that the Department describe a regulatory option to streamline the sale of fresh fish to local markets as well as modifying gear type regulations to better accommodate participants in the fresh fish fishery.

We commend the Department for amending and streamlining the regulations for San Francisco Bay to allow take of herring for commercial purposes for both sac-roe and fresh fish market fisheries under one quota and one season. In contrast with previous seasons, this modification will allow all fish to be landed during the herring season to be sold for sac-roe or fresh fish purposes (pg 2-3). This will support a growing local and regional demand for fresh herring¹¹ which will serve to create a higher value product for the commercial fishery as well as create a larger market for locally sourced seafood. We remain interested in exploring the possibility of a commercial cast net fishery for Pacific herring in San Francisco Bay as has been requested by some local fishermen and hope to work with the Department on this possibility in the future.

Interagency coordination and multiagency stewardship of herring

As cited earlier, the Commission's forage policy includes the provision to "Facilitate consistency in the management of forage species, integrate with existing Fishery Management Plans, and encourage cooperation and collaboration across jurisdictions and international boundaries in managing forage species."

The DSED notes that "the U.S. Fish and Wildlife Service, NOAA Fisheries, U.S. Environmental Protection Agency (EPA), and other state and federal agencies have all received environmental documents that have been prepared regarding herring. To date, the Department has not received comments from these agencies."

In order to sustain a vibrant resource as both forage for wildlife and harvest for commercial fishing, management of Pacific herring in California should include an assessment of habitat needs, threats, and best practices, and, an analysis of the roles and responsibilities of a number of agencies. Toward that end, the FSED should explicitly support the initiation of improved interagency cooperation and collaboration by at least including references to other agencies' existing actions and goals for herring, including the Bay Conservation and Development Commission, the Habitat Goals Project (Subtidal Goals), the Coastal Conservancy, NOAA/NMFS, US Geological Survey, Golden Gate National Recreation Area (National Park Service), the Pacific Fishery Management Council, and Pt. Reyes National Seashore. The FSED should also include reference to the state marine reserves established through the Marine Life Protection Act process, and to Department cross-jurisdictional responsibilities and opportunities, for example South Humboldt Bay State Marine Resource Management Area (Figure 2, below).

Other recommended changes to the DSED

We request the Department remove or alter the section describing the independent peer review of its fishery management approaches, which took place in 2003 (pg 2-9). The peer review concluded 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." This peer review is outdated in that it did not include consideration of the energetic needs of predators or other Essential Fishery Information needed to generate a harvest control rule and required as per the Commission's policy on forage species. As written this section misrepresents and contradicts other statements in the DSED describing a 5% or lower harvest rate as precautionary and appropriate given the foundational importance of herring as forage as well as continued concerns about the age structure of the herring population (Figure 3.4), and about the substantial decline between 2011-2012 and 2012-2013 in Average Condition Index of spawning fish (Figure 3.5). Finally, we recommend improved geospatial description of herring ecology and management in San Francisco Bay and other areas. At a minimum, a map of historic use of spawning areas (for example Figure 1, below) and a map of areas open and closed to commercial fishing.

In sum, we support the following management actions for the 2013-2014 season:

- maintain a maximum harvest rate of 4.7% of the estimated spawning biomass for the San Francisco Bay fishery;
- close fisheries in Tomales Bay, Humboldt Bay, and Crescent City by setting a quota of zero;
- streamline regulations to allow sale of fresh fish to local markets;
- provide additional detail on the progress and plan for establishing clear reference points and an ecosystem-based harvest control rule;
- provide an updated analysis of currently available information on the dietary importance of Pacific herring to California predators; include more detailed list of management objectives specifically including the establishment of reference points and a harvest control rule; and
- include references to other agencies' and other Department jurisdictional responsibilities (especially marine reserves) for herring stewardship.

- Improved geospatial description of herring spawning areas and areas open and closed to fishing.

Again, we are encouraged by the progress made thus far by the Department, and the responsiveness to our comments over the past year, and we look forward to continued partnership with the Department, Commission, and industry to ensure a vibrant Pacific herring resource to support California's wildlife and commercial fishery.

Please include this letter in the administrative record of proceedings for the management of the California commercial herring fishery. Thank you for the opportunity to comment, and we look forward to future collaboration.

Sincerely,



Anna Weinstein
Seabird Program Manager
Audubon California
220 Montgomery St., Suite 2000
San Francisco, CA 94104
aweinstein@audubon.org



Andrea Treece, Staff Attorney
Earthjustice
50 California Street, Suite 500
San Francisco, CA 94111



Seth Atkinson
Oceans Program Attorney
Natural Resources Defense Council
satkinson@nrdc.org



Geoffrey G. Shester, Ph.D.
California Program Director
Oceana
99 Pacific Street, Suite 155C
Monterey, CA 93940
gshester@oceana.org



Greg Helms
Manager, Pacific Program
Ocean Conservancy
Greg Helms
ghelms@oceanconservancy.org



Paul Shively
Manager, U.S. Oceans, Pacific
The Pew Charitable Trusts
pshively@pewtrusts.org

Cc: Ryan Bartling, Tom Grenier

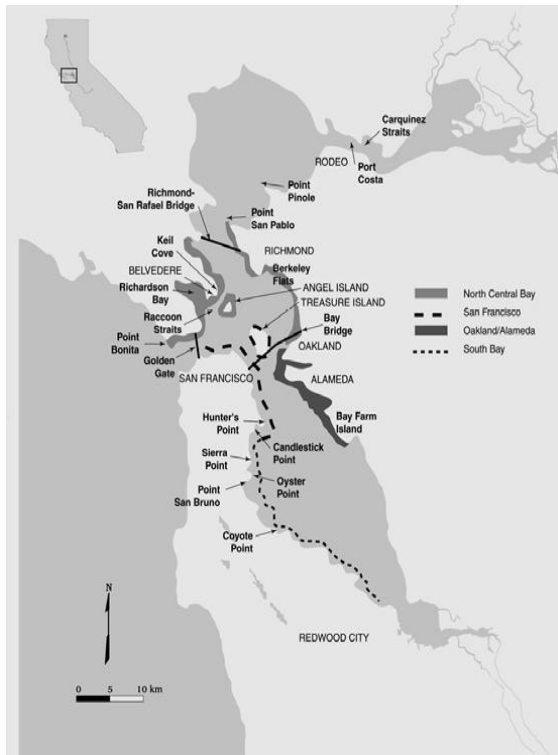


Figure 1. Historic herring spawning areas within San Francisco Bay (source: Incardona, J. 2011.
http://www.fws.gov/contaminants/Restorationplans/CoscoBusan/Cosco_Settlement/App_D_Herring_Injury_Study.pdf

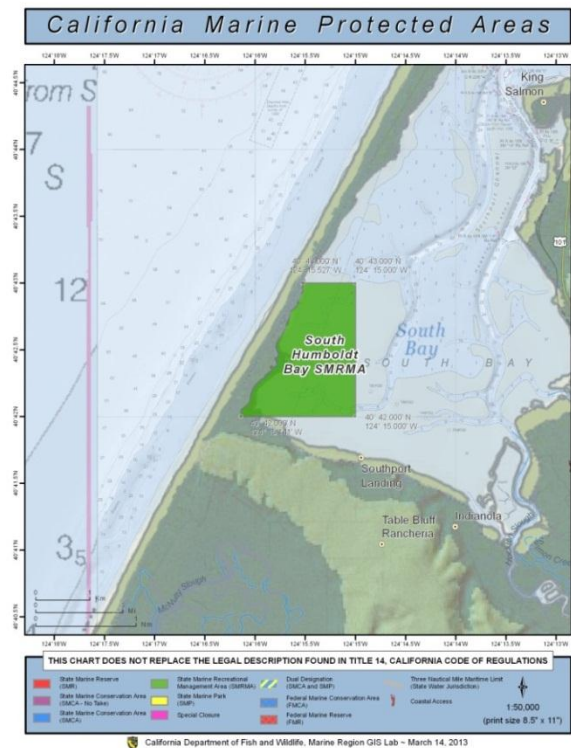


Figure 2. South Humboldt Bay State Marine Resource Management Area.
<https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=47721&inline=true>

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- ¹ Marine Resources Committee of the California Fish and Game Commission. 2013. Sacramento, CA. March.
- ² Letter to the California Fish and Game Commission. 2012. Audubon California et al.
- ³ Letter to the California Department of Fish and Wildlife and the California Fish and Game Commission: scope and content of the 2013-2014 Supplemental Environmental Document for commercial herring fishing in California's ocean waters. 2013. Audubon California et al.
- ⁴ Department of Fish and Wildlife. 2013. Notice of preparation for the 2013-2014 Supplemental Environmental Document. January.
- ⁵ California Fish and Game Commission. 2013. Fisheries Policies.
<http://www.fgc.ca.gov/policy/p2fish.aspx#FORAGE>
- ⁶ Rice, S., J. Moran, J. Straley, K. Boswell, and R. Heintz. 2010. Significance of whale predation on natural mortality of Pacific herring in Prince William Sound. Restoration Project:100804. Final Report.
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- ⁹ Roth, J., Nur, N., Warzybok, P., and W. Sydeman. 2008. Annual prey consumption of a dominant seabird, the Common Murre, in the California Current ecosystem. ICES Journal of Marine Science, 65: 1046–1056.
- ¹⁰ Weathers, W. and J. Kelly. 2007. The importance of ephemeral food abundance to wintering waterbirds: energy footprints on Tomales Bay. The Audubon. Audubon Canyon Ranch. Tomales, CA.
- ¹¹ Finn, M. Herring back on menu of Bay Area Restaurants. San Francisco Chronicle.
<http://www.sfgate.com/recipes/article/Herring-on-menus-of-Bay-Area-restaurants-4283165.php>